[Course Introduction](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=0&mode=live)

[Node is a big framework](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=0&mode=live&start=57.131571428571434) [with many built in modules and concepts](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=0&mode=live&start=59.998714285714314) [which you need to learn, but they require](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=0&mode=live&start=62.12600000000001) [much longer time and bigger effort. This](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=0&mode=live&start=64.4006666666667) [course is designed to help you get ready](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=0&mode=live&start=66.59549999999999) [for that. Here are the main topics covered](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=0&mode=live&start=69.12707692307691) [in this course and you can see them here](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=0&mode=live&start=71.61138461538457) [in order. First, we'll go over some of the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=0&mode=live&start=73.98715384615389) [core features in Node and how to execute](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=0&mode=live&start=76.15614285714287) [scripts and work with the command line.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=0&mode=live&start=78.09271428571435) [Then we'll do a review of the modern](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=0&mode=live&start=79.86061538461539) [features in JavaScript that you can](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=0&mode=live&start=81.99292307692306) [execute in your Node. js today. After](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=0&mode=live&start=84.07199999999999) [that, we'll talk about Node's package](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=0&mode=live&start=86.79266666666668) [manager, npm. Then probably the most](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=0&mode=live&start=89.2026666666667) [important part about this course is when](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=0&mode=live&start=91.21066666666664) [we start talking about modules in Node and](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=0&mode=live&start=93.31883333333326) [how Node handles slow operations. Then](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=0&mode=live&start=97.07449999999999) [we'll go over some examples about working](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=0&mode=live&start=99.81108333333333) [with web servers in Node, both natively](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=0&mode=live&start=101.69466666666662) [and with external tools. And finally,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=0&mode=live&start=104.32714285714285) [we'll talk about how to work with the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=0&mode=live&start=107.063)[operating system files and commands. A lot](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=0&mode=live&start=109.70700000000001) [more features in the Node API will not be](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=0&mode=live&start=112.27059999999999) [covered by this course. For example, this](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=0&mode=live&start=114.78879999999994) [course will not cover C++ add-ons,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=0&mode=live&start=116.96640000000001) [buffers, and streams, modules like crypto,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=0&mode=live&start=119.08320000000002) [zlib, dns, net and dgram, and many others](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=0&mode=live&start=122.27299999999997) [that I classify as more advanced concepts.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=0&mode=live&start=126.46839999999999) [The good news is that I created an](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=0&mode=live&start=129.638) [advanced Node course here at Pluralsight](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=0&mode=live&start=131.8423076923078) [as well, so after finishing this Getting](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=0&mode=live&start=133.594)[Started course, I think you'll be ready to](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=0&mode=live&start=136.21199999999996) [take a deeper dive and explore the other](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=0&mode=live&start=138.30700000000004) [advanced concepts that I cover in this](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=0&mode=live&start=140.103) [Advanced Node. js course here. I am](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=0&mode=live&start=143.37141666666665) [recording this course on a Mac Book. If](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=0&mode=live&start=146.20857142857142) [you have a Windows machine, things are](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=0&mode=live&start=148.21885714285702) [going to be a bit different for you. Node](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=0&mode=live&start=150.03454545454542) [itself is a bit different on Windows than](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=0&mode=live&start=152.4446) [it is on Linux and Mac. You might run into](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=0&mode=live&start=154.4334000000001) [problems that I don't. If you do run into](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=0&mode=live&start=157.32814285714284) [problems that block your progress in this](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=0&mode=live&start=160.4852142857142) [course, please don't hesitate to ask for](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=0&mode=live&start=162.5285454545454) [help in the discussion section of this](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=0&mode=live&start=164.6552) [course. If you have a modern Windows](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=0&mode=live&start=167.16190000000006) [machine, one option that might work a lot](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=0&mode=live&start=169.0024285714285) [better for you is to install the Windows](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=0&mode=live&start=170.979) [subsystem for Linux. This option will give](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=0&mode=live&start=173.50990909090908) [you the best of both worlds. You'll have](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=0&mode=live&start=175.33700000000005) [your Windows operating system running](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=0&mode=live&start=177.47266666666667) [Linux without needing to reboot, so you](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=0&mode=live&start=179.51933333333335) [can work a Linux file system with your](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=0&mode=live&start=181.74030769230768) [Windows editor, for example, which I think](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=0&mode=live&start=183.984) [is great. I've tested this option and I](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=0&mode=live&start=186.15866666666665) [can confidently say that this will](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=0&mode=live&start=188.66600000000003) [probably be the future of writing code for](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=0&mode=live&start=190.552) [Node on Windows. Node is usually deployed](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=0&mode=live&start=193.93236363636365) [on Linux machines in production, so by](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=0&mode=live&start=196.17133333333328) [using a Linux environment on your Windows](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=0&mode=live&start=197.87116666666654) [machine, you'll be closer to the way your](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=0&mode=live&start=200.40709090909084) [applications are running production, and](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=0&mode=live&start=203.13639999999998) [that's always a good win. I often get](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=0&mode=live&start=204.50039999999993) [complaints that my Pluralsight courses are](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=0&mode=live&start=207.67525000000003) [a bit fast and it's hard for people to](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=0&mode=live&start=209.0977500000001) [keep up. This is true and this course will](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=0&mode=live&start=211.16328571428565) [no exception. It's not that I am a fast](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=0&mode=live&start=213.25035714285713) [talker, it's the fact that these courses](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=0&mode=live&start=215.78257142857132) [are tightly edited with no breaks. A lot](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=0&mode=live&start=218.08733333333336) [of content is intentionally jammed into a](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=0&mode=live&start=221.25709090909092) [short course. That, however, does not mean](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=0&mode=live&start=224.09590909090915) [that you can't manually give yourself](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=0&mode=live&start=226.3999166666667) [breaks. The most important button in the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=0&mode=live&start=228.19141666666675)[Pluralsight video player is probably the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=0&mode=live&start=229.98727272727274) [Pause button, use it often. For example,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=0&mode=live&start=231.54007692307692) [every time I ask a question, pause the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=0&mode=live&start=233.6756153846153) [video and think of it. Every time I use](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=0&mode=live&start=236.26337500000002) [something that you've never seen before,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=0&mode=live&start=239.35759999999993) [pause the video and Google it. Rewind and](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=0&mode=live&start=241.343) [watch things many times if you need to. If](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=0&mode=live&start=244.11433333333335) [you're used to the pace and breaks of](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=0&mode=live&start=247.11142857142863) [workshops, you'll find the pace here much](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=0&mode=live&start=249.68971428571444) [faster. The Pause and Rewind buttons are](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=0&mode=live&start=251.90599999999995) [your best friends. Also, in some of the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=0&mode=live&start=254.1299230769231) [modules of this course I'll be presenting](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=0&mode=live&start=256.76930769230773) [you with challenges, pause the video and](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=0&mode=live&start=259.2292307692307) [do these challenges. The best way to learn](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=0&mode=live&start=261.889769230769) [is really to do. I'll be also asking a lot](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=0&mode=live&start=264.1290624999999) [of questions in this course and I'll](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=0&mode=live&start=266.3271874999998) [answer these questions right after, but I](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=0&mode=live&start=268.60718181818174) [want you to imagine yourself in an](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=0&mode=live&start=270.8405714285714) [interview for a job about Node. js and](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=0&mode=live&start=272.64857142857136) [treat these questions as if they were your](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=0&mode=live&start=275.0287692307693) [interview questions. Try to answer them](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=0&mode=live&start=277.93215384615405) [first before you listen to me answering them.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=0&mode=live&start=282.658)

[What Is Node?](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=1&mode=live)

in Node, so let me start at the very [probably the simplest definition of Node,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=1&mode=live&start=11.0378) [it's JavaScript on your backend servers.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=1&mode=live&start=13.616600000000002) [Before Node, that was not a common or easy](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=1&mode=live&start=15.932000000000002)[thing to do. JavaScript was mainly a](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=1&mode=live&start=19.01) [frontend thing. This isn't really a](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=1&mode=live&start=22.516222222222215) [complete definition because Node offers a](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=1&mode=live&start=24.513333333333335) [lot more than executing JavaScript on the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=1&mode=live&start=26.006333333333338) [server. In fact, the execution of](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=1&mode=live&start=28.3399090909091) [JavaScript on the server is not done by](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=1&mode=live&start=30.543) [Node at all, it's done with a virtual](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=1&mode=live&start=33.18139999999999) [machine, VM like V8 or Chakra. Node is](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=1&mode=live&start=35.944) [just the coordinator, it's the one who](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=1&mode=live&start=39.57600000000001) [instructs a VM like V8 to execute your](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=1&mode=live&start=42.78784615384616) [JavaScript. So Node is better defined as a](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=1&mode=live&start=46.48753846153848) [wrapper around a VM like V8. I'm going to](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=1&mode=live&start=49.43499999999998) [use the term V8 in this course because](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=1&mode=live&start=52.12857142857142) [that's the default VM in Node, but you can](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=1&mode=live&start=53.63142857142854) [totally run Node with other VMs if you](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=1&mode=live&start=56.095874999999985) [need to. So when you write JavaScript from](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=1&mode=live&start=58.630374999999965) [Node, Node will pass your JavaScript to](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=1&mode=live&start=61.18849999999998) [V8, V8 will execute that JavaScript and](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=1&mode=live&start=63.491692307692304) [tell Node what the result is, and Node](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=1&mode=live&start=66.14253846153844) [will make the result available to you.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=1&mode=live&start=69.27560000000001) [That's the simple story. But Node is a bit](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=1&mode=live&start=72.168) [more useful than just that. Besides the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=1&mode=live&start=74.55492857142852) [fact that enables us to execute JavaScript](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=1&mode=live&start=76.40066666666667) [on a server, which is done through a](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=1&mode=live&start=78.2195) [seamless integration with V8, Node comes](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=1&mode=live&start=80.45816666666664) [with some handy built-in modules providing](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=1&mode=live&start=82.20916666666662) [rich features through easy to use](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=1&mode=live&start=85.02) [asynchronous APIs. In the next module,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=1&mode=live&start=87.87633333333333) [we'll talk about that and a few other](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=1&mode=live&start=89.90033333333334) [reasons why developers are picking Node.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=1&mode=live&start=92.7645) [js over many other options when it comes to creating servers on their back ends.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=1&mode=live&start=95.11949999999999)

[Why Node?](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live)

[We learned that Node allows us to easily](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=1.007) [execute JavaScript code on servers, but](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=3.610076923076923) [this is not really impressive. It was even](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=5.5549333333333335) [possible to do that before Node. So let me](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=8.0984) [put the big question out here, why Node?](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=10.975000000000001) [Since you're watching this course now, you](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=13.559) [probably know a reason or two why Node is](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=15.021999999999997) [a great thing to learn, but let me make](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=17.048333333333325) [sure everyone knows all the reasons before](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=19.19093333333331) [we commit to this journey. So besides](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=21.906454545454555) [being an easy way to execute and work with](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=24.54133333333333) [JavaScript on the server, Node comes with](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=27.107833333333318) [some feature-rich, built-in modules. This](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=31.045199999999994) [makes it a great platform for tools, not](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=33.899375) [just a platform to host backend servers.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=37.25437500000002) [But here's the big deal about the modules](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=40.19) [that are packaged with Node, all of them](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=42.13953846153845) [offer asynchronous APIs that you can just](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=44.66992307692307) [use and not worry about threads. Yes, you](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=47.731076923076905) [can do asynchronous programming in Node,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=51.558) [do things in parallel, without needing to](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=54.576) [deal with threads, which is probably the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=57.15129999999999) [biggest benefit of using a runtime like](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=60.029666666666664) [Node. And if the built-in packages were](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=63.13533333333332) [not enough for you, you can build highly](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=64.84176923076924) [performing packages using C++. Node is](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=66.84590909090909) [JavaScript, but it has first class support](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=70.03136363636364) [for C++ addons, creating dynamically](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=73.97449999999999) [linked shared objects that you can use](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=77.00699999999998) [directly in Node. Of course, you can also](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=79.93624999999999) [write your addons in JavaScript too if you](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=82.6202857142857) [want. Node also ships with a powerful](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=85.26714285714283) [debugger, which I'll show you how to use](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=86.97850000000003) [in the last module of this course. Node](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=89.0102857142857) [also has some handy generic utilities that](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=91.61542857142852) [enhance the JavaScript language and](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=94.29833333333332)[provide extra APIs to work with, data](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=96.59888888888884) [types, for example. And we're not done, in](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=99.63033333333337) [fact these last two points on this slide](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=102.40278571428568) [is, in my opinion, the most important](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=104.78164285714278) [ones. And this is why this course will](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=106.55684615384617) [have full modules dedicated to these last](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=108.8495) [two points. As a starter here, I wrote an](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=112.82900000000001)[article about the exact topic of why Node,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=115.60749999999997) [with a lot more details around the last](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=117.52521428571428) [two points in the slide. Let me go over](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=119.7349285714286) [this article quick and summarize it here](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=122.00399999999998) [for you. This article is about why React](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=123.55799999999994) [developers love Node, but it really](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=125.9595) [applies to just Node in general, why](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=127.917)[JavaScript frontend developers in general](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=130.64069999999992) [love Node. So Node is a platform for](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=132.84199999999998) [tools. So even if you don't want to host](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=136.97799999999995) [your whole application in Node, Node is a](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=139.13684615384625) [great platform for tools and the reason](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=140.99425000000002) [it's great, because you have a lot of](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=142.93383333333338) [options. You have so many tools out there](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=145.30985714285708) [because Node was the first major](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=147.739) [JavaScript execution engine that ships](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=150.16420000000002) [with a reliable package manager, which is](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=152.2388) [called npm. We did not have a package](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=155.44339999999994) [manager for a long time in the JavaScript](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=157.80928571428578) [world, so npm is actually very](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=159.743) [revolutionary in here because it changed](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=162.03990909090908) [the way we work and share JavaScript, and](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=164.24507692307694) [Node was the enabler here because npm is](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=166.57369230769237) [part of Node. Npm is basically the world's](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=169.08066666666667)[largest collection of free and reusable](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=171.766) [code. You can make a feature rich Node](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=175.02314285714286) [application just by using code that's](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=177.81407692307684) [freely available on npm. Npm is a reliable](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=179.741) [package manager, which comes with a CLI](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=183.67940000000002) [that we're going to explore, and that CLI](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=185.9601538461539) [makes it really easy to install third](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=188.034) [party packages and, in general, share your](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=190.1894166666667) [own code and reuse your own code. And the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=192.5376666666667) [npm registry, where the packages get](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=196.1055)[hosted, has so many options, and by so](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=198.31800000000004) [many I mean hundreds of thousands of](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=201.12333333333333) [options of free tools that you can just](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=203.45141666666666) [install and use in your system. The other](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=206.51992307692308) [big thing about Node is that it comes with](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=209.5973076923077) [a reliable module dependency manager,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=212.89269230769236) [which is different than npm. This module](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=214.98737500000001) [dependency manager, which is often](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=217.85479999999998) [referred to as CommonJS, is also another](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=219.34679999999992) [thing that we do not have in the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=221.86285714285717) [JavaScript world. More accurately, we did](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=225.10457142857152) [not have for a long time. Because](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=227.1038) [JavaScript today has what's known as](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=229.2302222222222) [ECMAScript modules, but these modules,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=231.28955555555547) [despite being part of the language](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=233.08989999999997) [officially, are still a work in progress,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=235.31769999999992) [as of 3 years after they were approved.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=237.86614285714282) [They're still not completely supported by](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=240.769) [all implementations. Node's CommonJS](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=243.33024999999998) [dependency system has been available since](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=245.0592) [Node was released and it opened the door](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=247.68480000000002) [to so much flexibility in how we code](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=250.66399999999993) [JavaScript. It is widely used, even for](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=253.46933333333317) [JavaScript that gets executed in the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=255.95650000000006) [browser because Node has many tools to](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=258.093) [bridge the gap between its CommonJS system](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=260.57736363636354) [and what browsers can work with today.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=263.47630000000004) [Npm, along with CommonJS, make a big](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=266.928) [difference when you work with any](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=269.2158333333335) [JavaScript system, not just the JavaScript](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=271.17420000000004) [that you execute on the server or in the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=273.11940000000016) [browser. If, for example, you have a fancy](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=275.85942857142857) [fridge monitor that happens to run on](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=278.216) [JavaScript, you can use Node for the tools](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=280.59074999999996) [to package, to organize, to manage](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=283.55479999999994) [dependencies, and to bundle your code and](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=286.0903999999999) [ship it to your fridge. Node also is not](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=289.1202727272727) [just for hosting JavaScript servers, but](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=292.24433333333343) [it's also a very good option to do so](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=293.67133333333356) [because of its non-blocking asynchronous](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=296.4651666666666) [nature, which you can use without dealing](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=298.121) [with threats. This is the main point that](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=300.6425555555554) [made Node different than any other system](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=302.4993076923076) [that was popular before Node. Node comes](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=303.825) [with first class support and easy APIs for](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=307.33063636363636) [many asynchronous operations, like reading](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=309.8491818181817) [and writing files, consuming data over the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=311.97142857142853) [network, and even compressing and](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=314.8771818181817) [encrypting data. You can do all these](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=316.8149090909089) [operations in Node asynchronously without](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=319.56200000000007) [blocking the main execution thread. This](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=321.534) [works great with V8 because V8 itself is](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=324.1745454545453) [single threaded. And this is true for both](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=327.39692857142865) [Node and browsers. You only get a single,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=330.1220714285717) [precious thread to work with and it's very](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=332.602076923077) [important to not block it. For example, in](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=334.935) [your browser, if your website blocks that](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=338.75979999999987) [single thread for, say, 2 seconds, the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=341.8069090909092) [user cannot scroll up and down during](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=344.67172727272725) [these 2 seconds. In Node, if an incoming](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=347.1618181818182) [HTTP connection to your web server was](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=349.87525)[handled synchronously rather than](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=352.18) [asynchronously, that will block the single](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=354.5705) [thread and your whole web server cannot](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=357.5715) [handle any other connection while the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=359.70825) [synchronous operation is active, and](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=361.861) [that's a big deal. Node asynchronous APIs](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=363.9226666666666) [also work great for cloud applications in](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=367.1260000000001) [general because a lot of these operations](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=370.752) [are asynchronous by nature. And of course,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=373.97136363636366) [by using Node, you are committing to the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=376.6234999999999) [flexible JavaScript language, which is](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=378.79016666666644) [used on every website today. It is the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=380.69300000000004) [most popular programming language, and](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=383.52609090909084) [that statement will continue to be true](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=384.8479090909089) [for decades to come. And despite its](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=387.1143333333334) [problems, JavaScript is actually a good](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=389.69266666666675) [language today. With Node, you get to have](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=392.2617142857143) [a single language across the full-stack.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=395.5885000000001) [Use JavaScript in the browser and use it](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=398.035) [for the backend as well, which means less](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=400.03992307692323) [syntax to keep in your head and less](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=402.4657692307692) [mistakes overall. This also means that you](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=405.59315384615365) [can have a better integration between your](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=407.55681818181824)[frontend code and your backend code. You](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=409.29158333333334) [can actually share code between these two](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=411.5076666666665) [sides. And using JavaScript on the backend](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=413.8223636363636) [also means that teams can share](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=416.26854545454535) [responsibilities among different projects.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=419.0868888888889) [Projects don't need a dedicated team for](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=421.062) [the frontend and a different team for the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=423.1211666666668) [backend. You would eliminate some](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=426.0456363636364) [dependencies between teams. The project](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=428.46836363636373) [can be a single team, the JavaScript](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=430.56860000000006)[people, they can develop APIs, they can](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=432.8317000000002) [develop web and network servers, and they](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=435.1557272727274) [can develop rich interactive websites.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=437.82642857142855) [Node, of course, has a few cons, which are](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=440.335) [interestingly the same pro points if you](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=443.4715) [just look at them with different bias. For](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=445.73336363636366) [example, the non-blocking nature is just a](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=448.293) [completely different model of thinking and](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=451.3099999999999) [reasoning about code, and if you've never](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=453.1672727272728) [done it before, it is going to feel weird](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=454.909) [at first. You need time to get your head](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=458.03527272727274) [wrapped around this model and get used to](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=460.53330769230786) [it. And the big npm registry with so many](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=462.7986923076923)[options means that for every single thing](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=466.03730769230765) [you need to do, you have many options to](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=468.15353846153835) [pick from, and some people hate that. You](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=470.70241666666664) [need to constantly research these options](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=473.2177499999999) [and make mental effort to pick the better](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=475.51050000000004) [options. These options usually have major](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=479.1091666666668) [differences. And also npm enabled shipping](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=481.8390000000001) [smaller and smaller code, which means you](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=484.44277777777785) [need to use more and more packages. It's](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=486.87950000000006) [not unusual for a Node application to use](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=488.94399999999996) [300 or more packages. This is both a good](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=492.0479999999998) [thing and a bad thing, depending on who](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=495.24199999999996) [you ask. I think it's a good thing.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=497.86919999999986)[Smaller packages are easier to control and](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=500.0169999999999) [maintain and scale, but you do have to](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=501.7707142857143) [make peace with the fact that you'll be](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=503.87242857142877) [using a lot of them. Smaller code is](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=506.02599999999995) [actually why Node is named Node. In Node](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=508.88366666666667) [we build simple, small, single process](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=512.758) [building blocks, nodes, that can be](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=515.6350000000002)[organized with good networking protocols](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=517.9787272727272) [to have them communicate with each other](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=519.709636363636) [and scale up to build large distributed](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=522.7727692307693) [programs. Scaling a Node application is](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=526.0918461538463) [not an afterthought, it's built right in to the name.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=2&mode=live&start=528.1873636363637)

[Some Analogies About Node](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=3&mode=live)

[I love thinking about real life analogies](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=3&mode=live&start=1.039) [that compare with the coding world. One of](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=3&mode=live&start=3.5218461538461536) [my favorite analogies about coding in](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=3&mode=live&start=6.052) [general is how it can be compared to](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=3&mode=live&start=7.257999999999997) [writing cooking recipes. The recipe in](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=3&mode=live&start=9.528727272727274) [this analogy is the program and the cook](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=3&mode=live&start=12.060181818181821) [is the computer. In some recipes, you can](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=3&mode=live&start=15.628666666666664) [use ready items and tools, like the cake](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=3&mode=live&start=18.64671428571429) [mix that you can use to make cupcakes, and](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=3&mode=live&start=21.29585714285715) [that specially shaped pan that makes it](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=3&mode=live&start=23.705000000000002) [easier to create cupcakes. When compared](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=3&mode=live&start=25.970999999999997) [to coding, you can think of these ready](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=3&mode=live&start=28.42499999999999) [items and tools for recipes to including](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=3&mode=live&start=31.151923076923065) [and using a package of code written by](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=3&mode=live&start=33.379) [others in your own code. Node, and its](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=3&mode=live&start=36.932846153846164) [powerful npm package manager, has their](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=3&mode=live&start=40.459692307692315) [place in this analogy. Npm is a place](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=3&mode=live&start=43.07107692307694)[where you can download code written by](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=3&mode=live&start=46.00566666666667) [others. Within this analogy, you can think](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=3&mode=live&start=48.09458333333335) [of npm as the store where you purchase the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=3&mode=live&start=50.05315384615385) [ready items and tools. You just bring them](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=3&mode=live&start=52.58716666666667) [to your project with a simple command. And](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=3&mode=live&start=54.975833333333334) [you can think of Node. js itself as your](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=3&mode=live&start=57.65315384615385) [kitchen, as it allows you to execute lines](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=3&mode=live&start=60.62938461538461) [in your coding recipes by using built-in](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=3&mode=live&start=62.82692307692305) [modules, like the oven and the sink.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=3&mode=live&start=65.44154545454546) [Imagine trying to cook without these](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=3&mode=live&start=68.575) [built-in modules in your kitchen, that](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=3&mode=live&start=70.45027272727275) [would be a lot harder. And just because](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=3&mode=live&start=72.32646153846154) [you have these built-in modules in your](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=3&mode=live&start=74.83415384615385) [kitchen, that doesn't mean you have food](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=3&mode=live&start=77.2963076923077) [ready to consume. Node is your kitchen, by](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=3&mode=live&start=80.11569230769237) [itself it's not enough, but it does make](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=3&mode=live&start=82.66207692307691) [your task to write useful code much more](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=3&mode=live&start=84.803) [easier. Throughout this course, you'll](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=3&mode=live&start=89.69011111111115) [hear me use the term callback all the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=3&mode=live&start=91.59053846153849) [time. So let me quickly tell you about it.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=3&mode=live&start=94.16961538461545) [A callback is just a fancy term for a](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=3&mode=live&start=96.84) [function. In Node, we call the function a](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=3&mode=live&start=99.75780000000005) [callback function if Node will call it](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=3&mode=live&start=102.62549999999997) [back for us at a later point in the time](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=3&mode=live&start=105.169) [of the program. This is done through an](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=3&mode=live&start=109.09669230769232) [asynchronous method. Here's the simple](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=3&mode=live&start=112.09) [callback function, which usually receives](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=3&mode=live&start=113.97200000000001) [data as its argument, and we just pass its](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=3&mode=live&start=115.89866666666668) [reference here to some asynchronous](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=3&mode=live&start=118.98933333333333) [method, and that asynchronous method will](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=3&mode=live&start=120.76) [get the callback invoked when the data is](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=3&mode=live&start=123.26800000000004) [ready. I have another analogy for you](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=3&mode=live&start=126.25549999999997) [about callbacks. When you order a drink](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=3&mode=live&start=128.913) [from Starbucks, in the store, not in the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=3&mode=live&start=131.085) [drive-through, they'll take your order and](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=3&mode=live&start=132.941) [your name and tell you to wait to be](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=3&mode=live&start=135.1806363636364) [called when your order is ready. After](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=3&mode=live&start=138.215) [awhile they call your name and give you](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=3&mode=live&start=140.36146153846155) [what you asked for. That name you gave](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=3&mode=live&start=143.5171538461539) [them is the callback function here. They](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=3&mode=live&start=146.62539999999998) [called it with the object that you](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=3&mode=live&start=149.24563636363635)[requested, the drink. So let me modify](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=3&mode=live&start=151.51809090909086) [this generic example of a callback to](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=3&mode=live&start=153.73399999999995) [demonstrate the Starbucks example. The](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=3&mode=live&start=155.90749999999989) [callback function is the name you give](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=3&mode=live&start=158.84383333333335) [during your Starbucks order, it's a](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=3&mode=live&start=161.32066666666674) [function that will be called with some](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=3&mode=live&start=163.2756) [data, which is your ready drink. When you](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=3&mode=live&start=165.16420000000002)[place your order, that's an asynchronous](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=3&mode=live&start=167.50990909090908) [method because your order will take some](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=3&mode=live&start=169.69063636363634) [time and they don't want to block the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=3&mode=live&start=171.901) [order in queue while your order is getting](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=3&mode=live&start=174.14100000000002) [prepared, that's why they'll call you](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=3&mode=live&start=177.26950000000005) [back. And that's the pattern of callback](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=3&mode=live&start=179.71107142857153) [functions in Node. Now modern JavaScript](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=3&mode=live&start=182.77466666666675) [and modern Node started adopting another](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=3&mode=live&start=185.22320000000002) [pattern for asynchronous programming,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=3&mode=live&start=187.46360000000004) [which we call promises. And a promise is a](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=3&mode=live&start=189.44328571428574) [little bit different than a callback. To](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=3&mode=live&start=193.02227272727276) [understand promises, imagine that you ask](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=3&mode=live&start=195.12554545454546) [someone to give you something, but they](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=3&mode=live&start=197.39681818181813) [give you something else, call it a mystery](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=3&mode=live&start=199.96599999999998) [object. They promise you that this mystery](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=3&mode=live&start=202.77933333333326) [object might eventually turn into the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=3&mode=live&start=205.843) [thing that you originally asked for. This](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=3&mode=live&start=208.57154545454546) [promise mystery object can always turn](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=3&mode=live&start=211.8513636363636) [into one of two possible forms, one form](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=3&mode=live&start=214.22807692307694) [is associated with success and the other](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=3&mode=live&start=216.81761538461544)[with failure. This is like if we ask a](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=3&mode=live&start=220.2535714285715) [chicken for a chick and the chicken gives](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=3&mode=live&start=222.77425) [us an egg instead. That egg might](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=3&mode=live&start=224.38025) [successfully turn into a chick or it might](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=3&mode=live&start=227.30500000000004) [die and be useless. If you like analogies](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=3&mode=live&start=230.8585714285714) [like these, I have a lot more of them. See](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=3&mode=live&start=233.69861538461538) [this article under freeCodeCamp, and most](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=3&mode=live&start=236.5168) [of these analogies are really related to](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=3&mode=live&start=238.18959999999993) [Node. For example, see the reactive](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=3&mode=live&start=240.44199999999995) [programming one and the errors versus exceptions one.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=3&mode=live&start=242.56599999999986)

[What You Get When You Install Node](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=4&mode=live)

[Follow this video for instructions on how](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=4&mode=live&start=1.335) [to install Node. If you've successfully](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=4&mode=live&start=4.223199999999999) [installed Node, you should see the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=4&mode=live&start=6.213100000000001) [following three commands available](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=4&mode=live&start=7.717300000000002) [globally in your system. First, the node](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=4&mode=live&start=9.466285714285716) [common itself, which if you run it without](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=4&mode=live&start=12.20525) [any argument, you'll get into this](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=4&mode=live&start=14.181916666666659)[interactive program where you can type and](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=4&mode=live&start=16.2885) [execute JavaScript. Here's a quick test of](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=4&mode=live&start=19.77) [how modern your Node is. I typed the test](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=4&mode=live&start=22.799000000000007) [for you right here under this GitHub gist.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=4&mode=live&start=25.609333333333336) [Go find this code and then copy this line](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=4&mode=live&start=28.416) [here, the first line, and paste it into](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=4&mode=live&start=31.714153846153856) [the Node's interactive session. Don't](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=4&mode=live&start=34.9) [worry if you don't understand this. It's](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=4&mode=live&start=36.942142857142855) [just a test of your Node capabilities. If](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=4&mode=live&start=39.277625) [this line was executed successfully](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=4&mode=live&start=42.39733333333333) [without any errors, like it did for me](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=4&mode=live&start=43.90399999999999) [here, you have a good version of Node. If](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=4&mode=live&start=46.31360000000001) [you get an error here, you should upgrade](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=4&mode=live&start=49.06314285714286) [your Node for this course. This course has](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=4&mode=live&start=51.808285714285724) [a modern JavaScript module where I'm going](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=4&mode=live&start=54.28649999999999) [to explain the modern concepts this simple](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=4&mode=live&start=56.06566666666663) [line is using. You can also test if your](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=4&mode=live&start=59.24899999999998) [Node has the new promises APIs using these](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=4&mode=live&start=62.53014285714286) [two calls in here. Util. promisify should](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=4&mode=live&start=64.765) [return a function like this and require](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=4&mode=live&start=68.2434) [fs. promises should return an object of](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=4&mode=live&start=71.518) [the full fs API, just like this. So if](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=4&mode=live&start=74.15099999999997) [these calls are giving you errors or](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=4&mode=live&start=77.34927272727272) [undefined objects, it'll be a good idea](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=4&mode=live&start=79.32772727272722) [for you to upgrade your Node before](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=4&mode=live&start=81.76333333333332) [starting this course. The other two global](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=4&mode=live&start=84.38179999999997) [commands that you should have are npm and](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=4&mode=live&start=86.55353846153848) [npx. You get these, as well, when you](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=4&mode=live&start=88.65261538461543) [install Node. We'll talk about these](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=4&mode=live&start=91.58511111111109) [commands in the course module dedicated](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=4&mode=live&start=93.31100000000002) [for npm. If you see these commands working](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=4&mode=live&start=94.75550000000005) [successfully for you, you can skip the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=4&mode=live&start=97.174) [rest of this installation instructions](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=4&mode=live&start=99.63157142857143) [video. To install Node on Windows, you can](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=4&mode=live&start=102.23442857142858)[simply download the installer from the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=4&mode=live&start=105.25272727272728) [nodejs. org website and run it locally.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=4&mode=live&start=107.30977777777778) [This way you'll be installing Node](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=4&mode=live&start=109.514) [natively on the Windows operating system.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=4&mode=live&start=111.782) [But remember what I said about Node on](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=4&mode=live&start=114.05) [Windows in the overview video, Node](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=4&mode=live&start=116.53800000000005) [natively on Windows is not really ideal,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=4&mode=live&start=118.35561538461539)[but if it's your only option, don't let](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=4&mode=live&start=120.1939230769231) [that stop you. If you were able to get a](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=4&mode=live&start=122.48242857142856) [Linux subsystem working for you on](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=4&mode=live&start=125.73385714285706) [Windows, great, all you need is two](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=4&mode=live&start=128.084) [commands. Let me show you how to find them](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=4&mode=live&start=130.919) [here real quick. In this downloads page,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=4&mode=live&start=132.69709090909095) [scroll and find the article about](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=4&mode=live&start=134.63272727272727)[installing Node via a package manager,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=4&mode=live&start=136.76381818181818) [click that. You can also just Google this](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=4&mode=live&start=139.21525000000003) [exact title here if the UI of the Node](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=4&mode=live&start=142.5443076923077) [website has changed. The Linux](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=4&mode=live&start=146.09307692307706) [distribution that you used in your](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=4&mode=live&start=147.86781818181817) [subsystem is probably Ubuntu here, so](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=4&mode=live&start=149.64327272727263) [click on that link, and under this section](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=4&mode=live&start=151.52399999999997) [here, you'll find lines to install the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=4&mode=live&start=154.17199999999988) [recent version of Node. So these are the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=4&mode=live&start=157.41720000000004) [two lines that you need in your subsystem,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=4&mode=live&start=160.11166666666668) [or Linux in general. You should also](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=4&mode=live&start=161.615) [invoke this other line here about build](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=4&mode=live&start=163.8520833333333) [essentials, just in case you need to](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=4&mode=live&start=165.94149999999996) [install any native add-ons in the future.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=4&mode=live&start=167.66174999999987) [On Mac, you can download and install Node](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=4&mode=live&start=171.956) [directly, but if you're already using the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=4&mode=live&start=174.24844444444452) [excellent Homebrew package manager, you](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=4&mode=live&start=176.76100000000005) [can just use that. All you need is brew](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=4&mode=live&start=178.71483333333333) [install node. Now this will get you the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=4&mode=live&start=182.94333333333327) [latest Node. If you don't have Homebrew on](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=4&mode=live&start=185.80750000000003) [your Mac, you should really take a look at](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=4&mode=live&start=187.54785714285714)[it, it's pretty cool. If you have an older](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=4&mode=live&start=189.5956) [version of Node running through Homebrew,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=4&mode=live&start=192.88190909090915) [the command you need here is brew upgrade](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=4&mode=live&start=194.029) [node, just like that. There's another](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=4&mode=live&start=197.9276666666667) [option that works on both Mac and Linux,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=4&mode=live&start=200.51746153846153) [and that is nvm, Node version manager. I](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=4&mode=live&start=203.07930769230762) [like this option because it allows you to](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=4&mode=live&start=205.60541666666668) [run multiple versions of Node and switch](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=4&mode=live&start=208.1722142857143) [between them using a simple command. If](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=4&mode=live&start=210.79871428571434) [you find yourself in a situation where you](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=4&mode=live&start=213.27221428571428) [need to work on a project that use](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=4&mode=live&start=215.04992857142847) [different versions of Node, nvm will help](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=4&mode=live&start=217.72600000000003) [you here. That's it for installing Node.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=4&mode=live&start=221.37766666666676) [Don't forget to make sure these lines work](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=4&mode=live&start=223.68725000000003) [for you on your new Node you just installed.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=4&mode=live&start=226.46)

[Example Files](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=5&mode=live)

[On the course review slide, there are](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=5&mode=live&start=1.14) [references to folders associated with the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=5&mode=live&start=3.6460000000000004) [modules of this course. These folders can](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=5&mode=live&start=5.622000000000001) [be found on GitHub or under the exercise](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=5&mode=live&start=7.5260000000000025) [files section. Here is the GitHub](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=5&mode=live&start=10.72066666666667) [repository that I'll be using throughout](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=5&mode=live&start=13.30133333333333) [this course. It will give us starting](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=5&mode=live&start=15.592333333333327)[points for code templates and let us focus](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=5&mode=live&start=17.48446153846153) [our time on concepts rather than wasting](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=5&mode=live&start=19.29) [time typing simple scripts. This repo is](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=5&mode=live&start=22.888636363636373) [hosted under GitHub. com/jscomplete/ngs.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=5&mode=live&start=27.11528571428571) [Ngs here is Node getting started. You can](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=5&mode=live&start=30.009) [see the different folders for the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=5&mode=live&start=32.537) [different modules right here. The same](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=5&mode=live&start=34.44933333333334) [content of this repo is also available](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=5&mode=live&start=36.394333333333364) [under the exercise files on the course](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=5&mode=live&start=38.6289090909091) [page, if you don't have access to GitHub.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=5&mode=live&start=40.81736363636365) [Your first step is to clone this repo](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=5&mode=live&start=43.04800000000001) [locally to your machine. To clone this](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=5&mode=live&start=45.27523076923077) [repo, copy the ngs repo URL in here and](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=5&mode=live&start=47.439846153846126) [type the following command in your](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=5&mode=live&start=50.455090909090906)[terminal, git clone, the repo URL. This](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=5&mode=live&start=52.65872727272727) [will create a direct renamed ngs under](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=5&mode=live&start=55.36415384615385) [your current working directory. So cd into](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=5&mode=live&start=58.092) [this new ngs, and in here you can see the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=5&mode=live&start=60.7810769230769) [list of numbered folders. Let me open up](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=5&mode=live&start=64.29371428571427) [an editor here on this repo. So within the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=5&mode=live&start=66.70914285714288) [top level folders, which are associated](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=5&mode=live&start=70.09480000000003) [with modules in the course, you'll see](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=5&mode=live&start=72.09072727272726) [folders and files representing videos of](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=5&mode=live&start=73.96609090909087) [the course module in order. However, some](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=5&mode=live&start=75.95449999999998) [of the course videos will not have folders](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=5&mode=live&start=78.17333333333333) [and some folders here might have multiple](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=5&mode=live&start=80.16666666666667) [files representing the examples we are](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=5&mode=live&start=82.3345) [going to cover in its associated video.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=5&mode=live&start=84.44225) [The files are usually numbered in the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=5&mode=live&start=87.51) [order of their example in the video. And](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=5&mode=live&start=89.5775) [all these files in the ngs repo is your](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=5&mode=live&start=91.90464285714285)[starting point for each exercise we are](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=5&mode=live&start=94.24142857142863) [going to go through in this course. One](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=5&mode=live&start=96.58530000000002) [thing I'd like to point out before we](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=5&mode=live&start=99.94813333333333) [begin, this course has many modules. We](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=5&mode=live&start=102.48519999999998) [use the word module here to describe a](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=5&mode=live&start=104.67292307692308) [section in the course. The word module is](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=5&mode=live&start=106.95230769230771) [also heavily used with Node to refer to a](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=5&mode=live&start=109.55542857142855) [file or folder of code. To make this a](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=5&mode=live&start=112.84814285714279) [little bit less confusing, I will say](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=5&mode=live&start=116.16666666666669) [course module every time I refer to a](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=5&mode=live&start=118.70219999999999) [section of the course. So let's jump to](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=5&mode=live&start=121.5267333333333) [the course module and get you properly](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=5&mode=live&start=124.25566666666666) [introduced to the wonderful Node. js runtime.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=086f1e0a-2406-497a-8fb1-6cdcde24b8fb&clip=5&mode=live&start=126.55983333333332)

[Getting Started with Node](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=0&mode=live)

[Node’s REPL Mode](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=0&mode=live)

[In this Getting Started module, we'll](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=0&mode=live&start=0) [explore the Node command, and a few global](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=0&mode=live&start=2.8698) [features like timers and the process](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=0&mode=live&start=6.408818181818183) [object. It you type in the node command](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=0&mode=live&start=8.847545454545456) [without a script for it to execute, Node](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=0&mode=live&start=11.080999999999994) [will start a REPL session. REPL stands for](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=0&mode=live&start=13.469166666666666) [Read, Eval, Print, Loop, and it's a very](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=0&mode=live&start=17.181249999999995) [convenient way to quickly test simple](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=0&mode=live&start=19.597916666666652) [JavaScript and Node commands. You can type](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=0&mode=live&start=22.30111111111112) [in any JavaScript here in the REPL. For](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=0&mode=live&start=25.019399999999997) [example, a Math. random call, just like](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=0&mode=live&start=27.286615384615384) [that, and then you press Enter and Node](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=0&mode=live&start=30.13292307692308) [will read your line, evaluate it, print](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=0&mode=live&start=33.30749999999999) [the result, and then go back to waiting](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=0&mode=live&start=35.970999999999975) [for further lines. This is where the REPL](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=0&mode=live&start=38.751333333333335) [got its name, read a line, evaluate it,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=0&mode=live&start=41.27369230769231) [print its output, and loop until the user](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=0&mode=live&start=43.694) [exits the REPL. Note how the print step](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=0&mode=live&start=47.40599999999999) [happened automatically. We didn't need to](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=0&mode=live&start=50.623714285714286) [add any instructions to print the result.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=0&mode=live&start=52.78709090909091) [Node will just print the result of each](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=0&mode=live&start=55.295) [line you type. This is cool, but keep in](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=0&mode=live&start=56.95972727272725) [mind that some lines will not have any](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=0&mode=live&start=59.01114285714287) [results at all. The Node REPL will print](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=0&mode=live&start=60.914) [undefined in this case. For example, if](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=0&mode=live&start=63.718666666666664) [you define a variable like this, let](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=0&mode=live&start=66.65515384615384) [answer = 42, and you hit Enter, you'll see](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=0&mode=live&start=70.23484615384614) [undefined. This is because this is a](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=0&mode=live&start=73.54684615384616)[statement in JavaScript, it's not an](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=0&mode=live&start=75.621) [expression. It does not have any output,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=0&mode=live&start=77.82300000000002) [and this is why the REPL printed undefined](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=0&mode=live&start=79.73753846153846) [as the output of this statement. Don't let](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=0&mode=live&start=81.88128571428572) [that confuse you. On the other hand, let's](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=0&mode=live&start=84.52453846153847) [type out an expression, for example, 3 the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=0&mode=live&start=86.97869230769234) [number == 3 the character. This is a](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=0&mode=live&start=91.00350000000003) [Boolean expression. By the way, quick](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=0&mode=live&start=94.95759999999999) [question, do you think this expression](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=0&mode=live&start=96.65679999999995) [evaluates to true or false? Well, this is](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=0&mode=live&start=98.77149999999997) [one type of question that can be easily](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=0&mode=live&start=101.35575) [answered inside a Node REPL, you type it](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=0&mode=live&start=103.36308333333335) [real quick and hit Enter, and there you](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=0&mode=live&start=105.67199999999998) [go, this is surprisingly true. Well to be](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=0&mode=live&start=108.37462500000001) [honest, if you're surprised by this](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=0&mode=live&start=110.86792307692306) [answer, you might want to take a more](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=0&mode=live&start=111.74576923076918) [basic course about JavaScript itself](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=0&mode=live&start=113.71253846153847) [before this Node course. We are going to](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=0&mode=live&start=115.43946153846156) [do a JavaScript review module, but the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=0&mode=live&start=117.81146153846154) [basics of JavaScript, like operations and](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=0&mode=live&start=119.54476923076925) [types, will not be covered. If you need to](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=0&mode=live&start=121.64844444444445) [brush up on your JavaScript basics, I](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=0&mode=live&start=124.53623076923078) [recommend you check out the Pluralsight](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=0&mode=live&start=126.07138461538464) [series Quick Start to JavaScript. So this](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=0&mode=live&start=128.49933333333334) [line was a JavaScript expression and the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=0&mode=live&start=131.54883333333333) [REPL printed its result for us. Sometimes](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=0&mode=live&start=133.51875000000004) [the expression that you need to test might](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=0&mode=live&start=135.87133333333333) [need multiple lines. Let me clear this](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=0&mode=live&start=138.888) [REPL session, and I do that by pressing](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=0&mode=live&start=141.2066153846153) [Ctrl and L. This clears the session. And](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=0&mode=live&start=144.09577777777778) [let's see an example of multiple lines.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=0&mode=live&start=147.56275) [Say that you want to define a function](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=0&mode=live&start=149.738) [that generates today's date and test it](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=0&mode=live&start=152.36599999999993) [out. You'll start with a function name,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=0&mode=live&start=154.46092307692308) [I'm going to name it today, and then begin](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=0&mode=live&start=156.28307692307692) [with a curly brace, right? You can hit](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=0&mode=live&start=159.0887272727272) [Enter here. The Node REPL is smart enough](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=0&mode=live&start=161.78376923076925) [to detect that your line is not done yet](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=0&mode=live&start=164.4711538461539) [and it will go into this multi-line mode](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=0&mode=live&start=167.17149999999992) [for you to type more. So we can type](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=0&mode=live&start=169.64607142857142) [return new Date semicolon, hit Enter](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=0&mode=live&start=173.66071428571428) [again, then the end curly brace and Enter.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=0&mode=live&start=176.6232) [And now, Node figured out that this code](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=0&mode=live&start=181.336) [can be executed and it did execute it. We](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=0&mode=live&start=184.0530000000001) [can now use the today function in the REPL](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=0&mode=live&start=187.23572727272727)[session. This REPL multi-line mode is](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=0&mode=live&start=191.42727272727265) [limited. For example, if on line 3 you](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=0&mode=live&start=193.76424999999995) [realize that you made a mistake on line 1,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=0&mode=live&start=196.63313333333332) [you cannot go back and edit line 1. In](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=0&mode=live&start=198.87533333333332) [addition, you cannot type out multiple](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=0&mode=live&start=201.59918181818185) [expressions in the same multi-line](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=0&mode=live&start=203.8164545454546) [session. Luckily Node has a more featured](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=0&mode=live&start=205.5238181818182)[editor right here inside the REPL. You](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=0&mode=live&start=207.865) [type in. editor to open it up and when you](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=0&mode=live&start=211.1965) [do, you can type as many lines as you](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=0&mode=live&start=215.16284615384615) [need. For example, you can define multiple](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=0&mode=live&start=217.0673846153846) [functions or paste code from the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=0&mode=live&start=219.31992307692303) [clipboard. When you're done typing, you](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=0&mode=live&start=221.36084615384607) [hit Ctrl+D to have the REPL evaluate your](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=0&mode=live&start=223.51564285714284) [code. All the functions that you defined](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=0&mode=live&start=226.41907142857139) [in the editor will now be available in](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=0&mode=live&start=228.4029230769231) [your REPL session. The. editor command is](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=0&mode=live&start=230.5943076923077) [a REPL command and there are actually a](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=0&mode=live&start=232.69646153846148) [few other commands. You can see the list](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=0&mode=live&start=235.04192307692304) [by typing the. help command. The. break](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=0&mode=live&start=237.29238461538446) [command, or its. clear alias, let's you](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=0&mode=live&start=240.49549999999996) [get out of some weird cases in the REPL](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=0&mode=live&start=243.7605) [session. For example, when you paste some](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=0&mode=live&start=246.57075000000006) [code in Node's multi-line mode and you are](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=0&mode=live&start=249.14118181818182) [not sure how many curly braces you need to](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=0&mode=live&start=251.75600000000003) [get to an executable state, you can](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=0&mode=live&start=253.95500000000013) [completely discard your pasted code by](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=0&mode=live&start=256.66622222222225)[using a. break command. This saves you](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=0&mode=live&start=259.5695) [from killing the whole session to get](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=0&mode=live&start=262.58299999999997) [yourself out of simple situations like](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=0&mode=live&start=265.85149999999993) [this. The. exit command exits the REPL, or](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=0&mode=live&start=268.9444999999998) [you can simply press Ctrl+D. The. load](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=0&mode=live&start=272.79899999999986) [and. save commands can be used to generate](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=0&mode=live&start=275.835076923077) [and use external Node scripts inside your](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=0&mode=live&start=278.4393846153849) [REPL. This can be a great time saver. Here](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=0&mode=live&start=280.9206666666667) [is a fresh REPL session. Now let's I](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=0&mode=live&start=284.3015384615385) [started typing in this REPL session, I](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=0&mode=live&start=287.2738461538463) [defined one function and then I defined](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=0&mode=live&start=289.9169090909091) [another function, and then I defined a](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=0&mode=live&start=292.61636363636364) [third function, and now I have some](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=0&mode=live&start=294.66749999999996) [history in this REPL session. And what I](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=0&mode=live&start=296.5766666666667) [want to do is I'd like to statesve all](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=0&mode=live&start=298.5260000000002) [these functions to an external file to](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=0&mode=live&start=301.0635) [maybe review them later or maybe commit](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=0&mode=live&start=303.5729999999999) [them to Git. All I need to do is. save and](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=0&mode=live&start=306.1160000000001) [give it a file name. I'm going to call it](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=0&mode=live&start=310.1140769230769) [m7. js. And now if I inspect the content](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=0&mode=live&start=313.57484615384595) [of m7. js, this file will have all the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=0&mode=live&start=316.4141333333334) [lines that we previously typed in the REPL](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=0&mode=live&start=319.2247) [session, which is really cool. More](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=0&mode=live&start=322.0782999999999) [importantly, if later on we started a](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=0&mode=live&start=324.3116666666667) [brand new REPL session and we wanted to](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=0&mode=live&start=326.939) [redefine the functions we previously](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=0&mode=live&start=328.8709999999998) [defined in m7. js, all we need to do is](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=0&mode=live&start=330.29785714285714) [use the. load command with m7. js as the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=0&mode=live&start=334.90642857142865)[argument and Node will load all the lines](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=0&mode=live&start=338.89471428571414) [in the file and evaluate them, and now we](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=0&mode=live&start=342.369) [have access to the functions and variables defined in that file.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=0&mode=live&start=345.54664285714273)

[TAB and Underscore](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=1&mode=live)

[I need to emphasize the importance of the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=1&mode=live&start=2.02) [Tab key. If you're not familiar with this](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=1&mode=live&start=4.0776) [powerful key, you're in for a treat. The](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=1&mode=live&start=6.7040000000000015) [Tab character itself is not a very useful](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=1&mode=live&start=9.384714285714285) [one, but the Tab key is the driver of a](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=1&mode=live&start=11.11842857142857) [very powerful feature called tab](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=1&mode=live&start=13.993818181818181) [completion. You might be familiar with](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=1&mode=live&start=15.785636363636362) [that feature in your code editor, but I'd](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=1&mode=live&start=17.72627272727272) [like you to also be aware that it works](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=1&mode=live&start=20.315125000000002) [inside Node REPL as well. A single tab in](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=1&mode=live&start=23.42068750000001) [the Node's REPL can be used for auto](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=1&mode=live&start=26.19453333333334) [complete and the double tab, which is](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=1&mode=live&start=28.291600000000017) [pressing the Tab key twice, can be used to](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=1&mode=live&start=30.064571428571423) [see a list of possible things that you can](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=1&mode=live&start=32.28435714285713)[type from whatever partially typed string](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=1&mode=live&start=34.55566666666669) [you have. For example, if you type the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=1&mode=live&start=36.295833333333334) [character c and then double-tap on that,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=1&mode=live&start=39.20716666666668) [you'll see all the possible keywords and](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=1&mode=live&start=41.75) [functions that start with c. You could be](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=1&mode=live&start=44.31491666666666) [defining a constant or clearing a timer,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=1&mode=live&start=47.41024999999998) [and if you single Tab on something that](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=1&mode=live&start=49.730692307692294) [matches only a single option, it'll be](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=1&mode=live&start=52.05007692307689) [auto completed. For example, crypto here](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=1&mode=live&start=54.02974999999999) [is the only keyword that begins with cr,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=1&mode=live&start=56.18499999999999) [so if you single tab on cr, crypto will be](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=1&mode=live&start=59.369) [auto completed. This is, by the way, is](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=1&mode=live&start=63.46316666666665) [not about being lazy about typing the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=1&mode=live&start=65.97919999999998) [whole thing. The usefulness of this tab](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=1&mode=live&start=67.95926666666662) [completion is about avoiding typing](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=1&mode=live&start=70.02200000000003) [mistakes and discovering what is](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=1&mode=live&start=71.519) [available. This latter point is important.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=1&mode=live&start=74.79983333333332) [For example, say I want to know what API](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=1&mode=live&start=76.97391666666668) [functions and properties I can use on the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=1&mode=live&start=79.90266666666666) [array class. I can type Array, note how I](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=1&mode=live&start=83.11733333333329) [used single tab for that, but then I can](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=1&mode=live&start=85.77906250000004)[type the dot character and double-tap](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=1&mode=live&start=88.168) [after that. And there you go, these are](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=1&mode=live&start=90.90174999999999) [all the functions and properties that can](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=1&mode=live&start=93.10946153846156) [be used from the Array class. This also](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=1&mode=live&start=94.622) [works on objects. If I have an array](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=1&mode=live&start=98.55509090909088) [object inside this REPL session, I can use](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=1&mode=live&start=101.69464285714284) [the same dot and then double-tap trick to](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=1&mode=live&start=104.35807142857138) [get a list of all the methods available on](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=1&mode=live&start=106.91550000000004) [this object. If you can't remember the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=1&mode=live&start=109.59569230769232) [name of a method you need, this list is](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=1&mode=live&start=111.19061538461543) [helpful. The tab completion](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=1&mode=live&start=114.51408333333333) [discoverability works anywhere. Do you](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=1&mode=live&start=116.44375) [remember the special dot commands? Well](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=1&mode=live&start=118.71042857142858) [you can see them by double-tapping on a](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=1&mode=live&start=121.06654545454545)[single dot. This discoverability also](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=1&mode=live&start=123.52690909090903) [works on a global level. If you double-tap](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=1&mode=live&start=125.54299999999999) [on an empty line, everything that is](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=1&mode=live&start=129.1656923076923) [globally available appears. This is a big](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=1&mode=live&start=132.1703076923077) [list, but it's a useful one. The first](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=1&mode=live&start=134.48680000000004) [section here has all the common globals in](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=1&mode=live&start=136.74616666666665) [the JavaScript language itself, which](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=1&mode=live&start=139.61083333333326)[you're probably familiar with, like Array,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=1&mode=live&start=141.76733333333334) [Number, String, and Object classes, and](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=1&mode=live&start=144.648) [built in libraries like math and JSON, and](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=1&mode=live&start=146.12781818181813) [some top level functions. The other](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=1&mode=live&start=148.54627272727268) [section here mostly contains the globals](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=1&mode=live&start=150.91681818181806) [that are available in the Node runtime. A](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=1&mode=live&start=153.29681818181814) [few of these are truly globals in Node,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=1&mode=live&start=156.38653846153846) [like the Buffer class, the process object,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=1&mode=live&start=158.84684615384612) [and the various functions to set and clear](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=1&mode=live&start=161.48774999999998) [timers. The lowercase variables here, for](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=1&mode=live&start=165.24974999999992) [example dns, net, cluster, and http, those](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=1&mode=live&start=168.11318181818177) [represent the built-in modules in Node.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=1&mode=live&start=171.38614285714286) [These are Node's powerful libraries that](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=1&mode=live&start=173.793) [you get out of the box. Note how these are](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=1&mode=live&start=176.16800000000006) [available here directly in the REPL, but](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=1&mode=live&start=179.67100000000005) [when working with a regular Node script,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=1&mode=live&start=181.6185) [which we'll do next, you'll need to](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=1&mode=live&start=183.4070000000001)[require these modules to be able to use](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=1&mode=live&start=185.72874999999996) [them. One of the useful REPL features that](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=1&mode=live&start=189.19474999999986) [you can see here is the underscore](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=1&mode=live&start=191.7905333333333) [variable. This is similar to the $?](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=1&mode=live&start=193.9530666666666) [feature in bash. It stores the value of](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=1&mode=live&start=197.3226666666667) [the last evaluated expression. For](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=1&mode=live&start=200.6324444444445) [example, say that you executed a math.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=1&mode=live&start=202.41407692307695) [random call, and after you did, you wanted](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=1&mode=live&start=204.9206153846155) [to put the same value in a constant. You](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=1&mode=live&start=207.96390909090914) [can do that with underscore because it](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=1&mode=live&start=211.63146153846154) [automatically stores the last value. You](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=1&mode=live&start=213.91669230769224) [can use the underscore variable in any](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=1&mode=live&start=215.72361538461539) [place where you use a JavaScript](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=1&mode=live&start=216.94592307692304) [expression. I could do something like](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=1&mode=live&start=218.3929090909091) [const random = \_ to place the same last random value in a constant.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=1&mode=live&start=221.83636363636367)

[Executing Scripts](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=2&mode=live)

[Here is Node Hello World example. This](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=2&mode=live&start=1.817) [simple script represents a simple web](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=2&mode=live&start=3.974272727272727) [server. You don't need to install anything](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=2&mode=live&start=5.839307692307693) [to run this script. This is all Node's](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=2&mode=live&start=8.052384615384618) [built in power. Don't worry about figuring](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=2&mode=live&start=10.988333333333337) [out what's going on in this script just](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=2&mode=live&start=13.913166666666676) [yet. We'll get there eventually. To](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=2&mode=live&start=16.71041666666667) [execute this script with Node, you just](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=2&mode=live&start=18.671416666666666) [specify the location of the script as the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=2&mode=live&start=20.501333333333324) [argument for the Node command. You can](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=2&mode=live&start=23.491444444444443) [actually see the location of this script](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=2&mode=live&start=26.432166666666667) [within the projects folder, right here in](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=2&mode=live&start=28.217749999999988) [the corner for my atom editor here. And I](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=2&mode=live&start=30.627000000000006) [can also click this region here to copy](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=2&mode=live&start=34.119375) [the full path for this file. So now I'll](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=2&mode=live&start=36.580875) [go ahead and paste this full path right](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=2&mode=live&start=39.24664285714287) [here after the Node command and this will](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=2&mode=live&start=41.43235714285718) [execute the file. As you can see, it](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=2&mode=live&start=44.413875000000004) [reported back that server is running. The](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=2&mode=live&start=47.25463636363637) [script location that you specify for a](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=2&mode=live&start=49.49392857142857) [Node command can also be relative. So if](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=2&mode=live&start=52.202428571428555) [I'm inside this 1-getting-started,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=2&mode=live&start=55.953) [1-executing-scripts directory and I](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=2&mode=live&start=58.81100000000001) [specify node 1-hello-world, just like](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=2&mode=live&start=61.06416666666667) [that, Node will look for the file in the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=2&mode=live&start=63.12458333333335)[current working directory. If the script](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=2&mode=live&start=67.42899999999997) [that we're executing has a running task,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=2&mode=live&start=69.69607692307692) [like a web server listening for](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=2&mode=live&start=71.05892307692307) [connections, for example, then Node will](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=2&mode=live&start=73.24472727272727) [continue running. Note that if the script](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=2&mode=live&start=76.44818181818182) [does not have a running task, like this](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=2&mode=live&start=79.08207142857141) [other script here that just prints a](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=2&mode=live&start=81.58778571428566) [message, Node will execute this script and](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=2&mode=live&start=84.801) [exit immediately after that. And Node](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=2&mode=live&start=88.02183333333333) [process exiting is a normal thing in a](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=2&mode=live&start=89.94683333333337) [Node cluster. Node will not idle and use](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=2&mode=live&start=92.93630769230771) [resources unnecessarily. Okay because to](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=2&mode=live&start=96.63046153846159) [the simple web server script, and we'll](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=2&mode=live&start=98.78399999999999) [execute it again. So now this simple web](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=2&mode=live&start=101.65399999999997)[server script is running and its task is](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=2&mode=live&start=104.31864285714288) [active, it listens for all the HTTP](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=2&mode=live&start=106.61407142857148) [connections. However, this Node process](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=2&mode=live&start=109.08063636363637) [will only use V8 when there are HTTP](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=2&mode=live&start=110.897) [connections, otherwise V8 will remain](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=2&mode=live&start=114.46499999999999) [idle. Let's decipher this simple web](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=2&mode=live&start=116.69499999999998) [server. The first line here is using the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=2&mode=live&start=119.2385) [require function. This is the first thing](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=2&mode=live&start=122.54379999999999) [you need to learn about Node's internal.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=2&mode=live&start=125.12539999999994) [The require function is what you use to](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=2&mode=live&start=127.707) [manage the dependencies of your programs.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=2&mode=live&start=130.27957142857133) [You can use require to depend on any](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=2&mode=live&start=132.209) [library, whether this library is a](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=2&mode=live&start=134.71166666666676) [built-in one, like HTTP here, or if it's a](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=2&mode=live&start=136.80326666666664) [third party installed library. This](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=2&mode=live&start=140.58446666666657) [program here depends on the built-in HTTP](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=2&mode=live&start=142.7021111111111) [module. It's the module that has the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=2&mode=live&start=145.76188888888885) [features of creating a web server. There](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=2&mode=live&start=147.971) [are many other libraries that you can use](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=2&mode=live&start=149.99353846153846) [to create a web server, but this one is](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=2&mode=live&start=151.9978461538462) [built-in. You don't need to install](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=2&mode=live&start=154.15499999999997) [anything to use it, but you do need to](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=2&mode=live&start=155.54099999999994) [require it. Remember that when we were in](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=2&mode=live&start=158.83199999999994) [Node's REPL, this library was available](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=2&mode=live&start=161.4895) [immediately without needing to require it.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=2&mode=live&start=163.382) [This is not the case with executable](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=2&mode=live&start=165.49699999999996) [scripts, like this one. You can't use any](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=2&mode=live&start=167.9861) [dependencies without requiring them first.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=2&mode=live&start=170.97889999999998) [This line here creates a server constant](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=2&mode=live&start=173.15299999999996) [by invoking the createServer function on](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=2&mode=live&start=176.4393) [the HTTP module. This function is one of](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=2&mode=live&start=179.95709999999997) [the many that are available under the HTTP](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=2&mode=live&start=182.67849999999999) [module API. You can use it to create a web](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=2&mode=live&start=184.3556) [server and it accepts an argument that is](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=2&mode=live&start=187.6516) [known as the request listener. This is a](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=2&mode=live&start=190.6628888888889) [simple function that Node will invoke](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=2&mode=live&start=193.6720769230769) [every time there is a request to the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=2&mode=live&start=195.4582307692307) [created web server. This function is also](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=2&mode=live&start=197.976) [known as a callback, but this term is a](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=2&mode=live&start=200.29825) [bit old at this point. Remember this](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=2&mode=live&start=203.33399999999995) [argument as a listener. This server will](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=2&mode=live&start=205.71654545454544) [listen to requests and it will invoke the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=2&mode=live&start=208.14045454545447) [listener function for each request. And](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=2&mode=live&start=211.3082727272728) [this is why this listener function](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=2&mode=live&start=213.633) [receives the request object as an](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=2&mode=live&start=215.205) [argument. It's named req here, but you can](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=2&mode=live&start=217.05593333333331) [name it whatever you need. The other](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=2&mode=live&start=220.26766666666663) [argument this listener function receives,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=2&mode=live&start=222.99120000000002) [named res here, is a response object. It](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=2&mode=live&start=224.78170000000006) [is the other side of a request connection.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=2&mode=live&start=227.4375384615385) [We can use this object to write things](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=2&mode=live&start=229.968) [back to the requester. It's exactly what](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=2&mode=live&start=232.47999999999993) [this simple web server is doing. It's](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=2&mode=live&start=234.54600000000002)[writing back using the. end method and the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=2&mode=live&start=236.611) [Hello World string. We'll learn about the.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=2&mode=live&start=240.17099999999994) [end method later in this course, but it](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=2&mode=live&start=242.32600000000005) [can be used as a shortcut to write data](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=2&mode=live&start=243.96600000000015) [and then end the connection. The](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=2&mode=live&start=247.14100000000008) [createServer function only creates the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=2&mode=live&start=249.53433333333334) [server, it does not activate it. To](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=2&mode=live&start=251.62599999999995) [activate this web server, we need to](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=2&mode=live&start=254.45883333333333) [invoke the. listen function on the created](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=2&mode=live&start=256.71866666666665) [server. This function accepts many](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=2&mode=live&start=259.0853333333333) [arguments, like what OS port to use for](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=2&mode=live&start=260.87755555555555) [this server. The last argument here is a](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=2&mode=live&start=263.7726923076922) [function that will be invoked once the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=2&mode=live&start=266.4311666666666) [server is successfully running on that](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=2&mode=live&start=268.1257499999998) [port. This example just logs a message to](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=2&mode=live&start=270.0887499999999) [indicate that the server is now running.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=2&mode=live&start=273.38674999999967) [This listen function is what actually](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=2&mode=live&start=275.72749999999996) [keeps the Node process running. It's the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=2&mode=live&start=277.656) [task that will keep the Node runtime busy](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=2&mode=live&start=280.04461538461544) [and not exit. While the server is running,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=2&mode=live&start=282.8121538461538) [if we go to a browser and ask for an HTTP](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=2&mode=live&start=285.69276923076916) [connection on localhost with the port that](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=2&mode=live&start=289.8827142857143) [was used in this script, 4242 in this](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=2&mode=live&start=292.49157142857143) [case, we will see the Hello World string](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=2&mode=live&start=294.70414285714264) [that this example had in its request](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=2&mode=live&start=297.4228181818181) [listener. Go ahead and try to change this](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=2&mode=live&start=300.5397272727271) [line and return something else. You will](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=2&mode=live&start=303.22908333333334) [need to restart the Node process to make](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=2&mode=live&start=305.35169230769225) [that change work. Just kill the process](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=2&mode=live&start=307.43046153846126) [with Ctrl+C, use the up arrow to get the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=2&mode=live&start=309.5071428571429) [last executed command, and execute that](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=2&mode=live&start=312.42571428571455)[again. If you refresh the web browser now,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=2&mode=live&start=314.66083333333324) [you should see the newly returned string.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=2&mode=live&start=318.27750000000015) [When we build a full web server example,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=2&mode=live&start=321.512) [I'll show you how to avoid needing to](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=2&mode=live&start=323.03257142857126) [restart the server every time you change](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=2&mode=live&start=324.779) [something because this will be an annoying thing to keep doing manually.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=2&mode=live&start=326.9)

[Working with Timers](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=3&mode=live)

[Some of the popular global functions in a](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=3&mode=live&start=1.386) [browser environment are the timer](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=3&mode=live&start=3.366666666666667) [functions, like setTimeout and](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=3&mode=live&start=4.92) [setInterval. Node. js has an API for these](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=3&mode=live&start=7.171999999999999) [functions as well, and it exactly matches](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=3&mode=live&start=9.782) [the browser's API. These timer functions](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=3&mode=live&start=11.829) [can be used to delay or repeat the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=3&mode=live&start=14.450999999999997) [execution of other functions, which they](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=3&mode=live&start=18.04572727272727) [receive as arguments. For example, this](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=3&mode=live&start=20.963909090909077) [code uses setTimeout to delay the printing](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=3&mode=live&start=23.5445) [of this greeting message by 4 seconds. The](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=3&mode=live&start=26.161333333333335) [second argument to setTimeout is the delay](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=3&mode=live&start=29.26339999999999) [in millisecond. This is why we are](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=3&mode=live&start=31.80821428571429) [multiplying 4 by 1000 here to make it into](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=3&mode=live&start=34.08371428571428)[4 seconds. The first argument to](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=3&mode=live&start=37.166916666666665) [setTimeout is the function who's execution](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=3&mode=live&start=39.306416666666664) [will be delayed. If we execute this](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=3&mode=live&start=42.06549999999999) [script, normally with the Node command,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=3&mode=live&start=44.88420000000001) [Node will pause for 4 seconds and then](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=3&mode=live&start=46.95) [it'll print the greeting and exit after](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=3&mode=live&start=49.81066666666665) [that. Note that this first argument to](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=3&mode=live&start=52.43363636363635)[setTimeout is just a function reference.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=3&mode=live&start=55.21645454545451) [It does not have to be an inline function](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=3&mode=live&start=56.80130769230769) [like this. For example, this code here](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=3&mode=live&start=58.979083333333335) [will do the same job, but it uses a](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=3&mode=live&start=60.92566666666668) [function defined before setTimeout. Note](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=3&mode=live&start=64.518) [that if the function that we pass to](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=3&mode=live&start=67.01563636363636) [setTimeout receives argument, like this](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=3&mode=live&start=71.12472727272728) [example here, argument 1, 2, 3, and more,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=3&mode=live&start=73.32445454545453) [then we can use the remaining arguments in](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=3&mode=live&start=76.451) [setTimeout to pass these arguments to the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=3&mode=live&start=79.84900000000002) [delayed function once it's executed with](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=3&mode=live&start=82.95499999999998) [setTimeout. Here's an example. Take a look](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=3&mode=live&start=85.76899999999995) [at this code and try to figure out what it](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=3&mode=live&start=87.61757142857144) [will do. The rocks function, which is](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=3&mode=live&start=90.55761538461539) [delayed by 2 seconds, accept a who](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=3&mode=live&start=94.40976923076927) [argument and our setTimeout calls relays](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=3&mode=live&start=97.98827272727272) [the value Pluralsight as the who argument.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=3&mode=live&start=100.74281818181814)[Executing the script will print out](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=3&mode=live&start=104.03372727272725) [Pluralsight rocks after 2 seconds. Time](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=3&mode=live&start=106.881) [for a challenge. Ready? Using what you](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=3&mode=live&start=111.21966666666667) [learned so far about setTimeout, print the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=3&mode=live&start=113.42233333333334) [following two messages after their](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=3&mode=live&start=116.37) [corresponding delays. Print the message](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=3&mode=live&start=119.18500000000002) ["Hello after 4 seconds" after 4 seconds,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=3&mode=live&start=121.61149999999999)[then print the message "Hello after 8](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=3&mode=live&start=124.646) [seconds" after 8 seconds. This would be an](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=3&mode=live&start=127.68209090909087) [easy challenge without constraints, but we](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=3&mode=live&start=130.30066666666664) [are not here to learn just the easy stuff.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=3&mode=live&start=131.62616666666656) [I have a constraint for you. You can only](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=3&mode=live&start=134.61976923076932) [define a single function in your script,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=3&mode=live&start=137.6551) [which includes inline functions. This](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=3&mode=live&start=139.634) [means many setTimeout calls will have to](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=3&mode=live&start=142.0006923076923) [use the exact same function. Okay, pause](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=3&mode=live&start=145.5615384615385) [here and try it out. I really hope that](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=3&mode=live&start=148.89366666666663) [you will try to do these course challenges](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=3&mode=live&start=152.44266666666653) [because, trust me on this, it is the best](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=3&mode=live&start=155.03230769230768) [way to get comfortable with what you're](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=3&mode=live&start=157.31) [learning. If you just watch, you'll learn,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=3&mode=live&start=159.34787499999996) [but it will be harder for you to retain](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=3&mode=live&start=160.9418571428571) [and improve. You do that when you start](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=3&mode=live&start=162.94633333333334) [pushing your limits and put yourself](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=3&mode=live&start=165.08500000000006) [outside your comfort zone. Here's how I'd](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=3&mode=live&start=167.29785714285717) [solve this challenge. I've made theOneFunc](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=3&mode=live&start=170.43179999999998) [receive delay argument and used that delay](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=3&mode=live&start=172.93739999999994) [argument in the printed out message. This](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=3&mode=live&start=175.91099999999994) [way the function can print different](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=3&mode=live&start=178.71681818181818) [messages based on whatever delay we pass](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=3&mode=live&start=180.2157272727272) [to it. I then used theOneFunc in two](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=3&mode=live&start=182.58576923076927) [setTimeout calls, one that fires after 4](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=3&mode=live&start=186.241153846154) [seconds, and another that fires after 8](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=3&mode=live&start=189.00115384615384) [seconds. Both of these setTimeout calls](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=3&mode=live&start=191.58576923076922) [also get a third argument to represent the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=3&mode=live&start=193.7666666666667) [delay argument for theOneFunc. Executing](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=3&mode=live&start=196.8923) [this script will print out the challenge](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=3&mode=live&start=199.83880000000005) [requirements. The first message after 4](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=3&mode=live&start=203.49259999999998) [seconds and the second message after 8](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=3&mode=live&start=206.08579999999995) [seconds. But what if I ask you to print](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=3&mode=live&start=208.73028571428566) [the message every 4 seconds forever? While](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=3&mode=live&start=212.24585714285715) [you can put setTimeout in a loop, Node](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=3&mode=live&start=215.98925) [offers the setInterval as well, which](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=3&mode=live&start=218.77525000000006) [would accomplish exactly that. Just use](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=3&mode=live&start=221.3525714285714) [setInterval instead of setTimeout. In this](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=3&mode=live&start=224.57833333333335) [example, this code will print its message](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=3&mode=live&start=227.82000000000002) [every 3 seconds. Node will print this](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=3&mode=live&start=230.88950000000006) [message forever until you kill the process](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=3&mode=live&start=234.15915384615388) [with Ctrl+C. Another cool thing about](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=3&mode=live&start=237.57892307692316) [these timers is that you can cancel them](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=3&mode=live&start=239.67285714285717) [with code. A call to setTimeout returns a](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=3&mode=live&start=241.90657142857148)[timerId and you can use it with a](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=3&mode=live&start=244.48614285714294) [clearTimeout call to cancel that timer.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=3&mode=live&start=247.181) [Here's an example. This simple timer here](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=3&mode=live&start=249.9196666666666) [is supposed to fire after 0 milliseconds,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=3&mode=live&start=252.71154545454544) [making it immediate, but it won't because](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=3&mode=live&start=255.201) [we are capturing the timerId and](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=3&mode=live&start=257.8947272727272) [cancelling it right after with a](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=3&mode=live&start=260.67080000000004) [clearTimeout call. When we execute this](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=3&mode=live&start=264.3812000000001) [script, Node will not print anything and](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=3&mode=live&start=266.6316666666667) [the process will just exit. By the way,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=3&mode=live&start=268.4055833333335) [there is another way to do setTimeout with](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=3&mode=live&start=270.768153846154) [0 millseconds, the timer API has another](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=3&mode=live&start=273.39560000000006) [function, it's called setImmediate, and](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=3&mode=live&start=276.2642000000002) [it's basically the same thing as a](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=3&mode=live&start=278.1092727272728)[setTimeout with a 0 millisecond, but we](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=3&mode=live&start=280.621) [don't have to specify a delay here, it's](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=3&mode=live&start=282.8728461538463) [an immediate thing. We'll see a practical](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=3&mode=live&start=285.23299999999995) [case for this function later in the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=3&mode=live&start=286.7379999999998) [course. And just like clearTimeout, there](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=3&mode=live&start=288.9838888888889) [is also a clearInterval, which does the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=3&mode=live&start=291.402) [exact same thing but for set interval](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=3&mode=live&start=294.3209999999998)[calls, and there is also a clearImmediate,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=3&mode=live&start=297.16363636363633) [which does the same thing for setImmediate](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=3&mode=live&start=299.949) [calls. So as you can hopefully see from](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=3&mode=live&start=303.77800000000013) [this example, executing something with](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=3&mode=live&start=307.02890909090917) [setTimeout after 0 millseconds, does not](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=3&mode=live&start=308.95627272727273) [mean execute it right away, but rather it](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=3&mode=live&start=311.24990909090906) [means execute it right away after you're](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=3&mode=live&start=314.14946153846154) [done with everything else in this script.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=3&mode=live&start=316.54776923076923) [Let me make this point clear with an](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=3&mode=live&start=319.29800000000006) [example. Here's a simple setTimeout call](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=3&mode=live&start=322.60200000000015) [that should fire after half a second, but](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=3&mode=live&start=324.6116666666668) [it won't. Right after defining the timer,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=3&mode=live&start=327.2328181818182) [we block Node synchronously with a big](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=3&mode=live&start=329.93354545454554) [loop. This is 1 with 10 zeros in front of](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=3&mode=live&start=332.33579999999995) [it, so this is a 10 billion ticks loop,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=3&mode=live&start=335.4477999999998) [which basically simulate a busy CPU. Node](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=3&mode=live&start=338.9355714285716) [can do nothing while this loop is ticking.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=3&mode=live&start=341.62044444444444) [This is, of course, a very bad thing to do](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=3&mode=live&start=344.04) [in practice, but it'll help you here to](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=3&mode=live&start=345.90933333333345) [understand that setTimeout delay is not a](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=3&mode=live&start=347.76199999999994) [guaranteed thing, but rather a minimum](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=3&mode=live&start=349.9039999999998) [thing. This 500 millisecond here means a](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=3&mode=live&start=352.0872727272727) [minimum delay of 500 milliseconds. In](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=3&mode=live&start=354.73436363636364) [reality, this script will take a lot](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=3&mode=live&start=357.1005454545456) [longer to print its greeting line. It will](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=3&mode=live&start=360.1113333333333) [have to wait on the blocking loop to](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=3&mode=live&start=363.79850000000005) [finish first. Let's do one more challenge](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=3&mode=live&start=367.0805000000002) [on timers. Print the message "Hello World"](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=3&mode=live&start=369.93308333333323) [every second, but only 5 times. After 5](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=3&mode=live&start=372.778) [times, print the message "Done" and let](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=3&mode=live&start=376.60799999999995) [the Node process exit. And you cannot use](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=3&mode=live&start=379.7347692307693) [a setTimeout call for this challenge.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=3&mode=live&start=382.96615384615404) [Little hint, you need a counter here.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=3&mode=live&start=385.88127272727263) [Okay, you can pause here. Hopefully this](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=3&mode=live&start=389.569) [was an easy one. I initiated a counter](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=3&mode=live&start=394.6026923076923) [value as 0 and then started a setInterval](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=3&mode=live&start=397.4654615384614) [call, capturing its Id. The delayed](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=3&mode=live&start=400.8901111111111) [function will print the message and](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=3&mode=live&start=403.6179230769231) [increment the counter each time. Inside](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=3&mode=live&start=406.1586923076923) [the delayed function, an if statement will](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=3&mode=live&start=408.64133333333336) [check if we're at 5 times by now, if so,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=3&mode=live&start=411.19866666666684) [it will print Done and clear the interval](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=3&mode=live&start=414.6297142857142) [using the captured interval constant. The](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=3&mode=live&start=417.256) [interval delay is 1000 milliseconds. In](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=3&mode=live&start=421.5645454545454) [this file here, I've put a couple more](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=3&mode=live&start=425.41346666666664) [challenges for you to practice timers. I](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=3&mode=live&start=427.48119999999994) [will not solve these challenges here, to](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=3&mode=live&start=429.3143333333333) [keep the course short, but I wrote an](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=3&mode=live&start=431.2906666666666) [article on Medium about them, which you](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=3&mode=live&start=433.2858461538462) [can read at this URL. I've also included the solutions in this course's folder.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=3&mode=live&start=434.801076923077)

[Node’s Command Line Interface](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=4&mode=live)

[So far we used the Node command in two](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=4&mode=live&start=1.647) [modes, to start a REPL with no arguments,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=4&mode=live&start=4.246200000000001) [and to execute a script by using a single](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=4&mode=live&start=6.813714285714286) [file path argument. The Node command,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=4&mode=live&start=10.569928571428568) [which is often called the CLI, also has](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=4&mode=live&start=12.956749999999998) [options which make it work differently.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=4&mode=live&start=15.982749999999994) [For example, the -v option makes it output](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=4&mode=live&start=17.62558333333334) [the version of the Node runtime, and the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=4&mode=live&start=19.757153846153848) [-p option makes it execute a string and](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=4&mode=live&start=22.646384615384626) [print out its result, which I find super](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=4&mode=live&start=25.680538461538468)[useful. For example, if I want to see how](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=4&mode=live&start=28.859615384615402) [many CPUs this machine has, I can use a](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=4&mode=live&start=31.11484615384617) [call to the built-in OS module, which has](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=4&mode=live&start=33.48914285714286) [a function called cpus, and I can do.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=4&mode=live&start=35.91542857142857) [length on that to see the size of the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=4&mode=live&start=39.15317647058823) [returned array. This machine has four](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=4&mode=live&start=43.09994117647057) [cores. Similarly, here's another one liner](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=4&mode=live&start=45.6782) [to see the version of the V8 used in the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=4&mode=live&start=48.23) [current Node installation. There are many](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=4&mode=live&start=52.120769230769206) [other options. You can see a full list by](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=4&mode=live&start=54.27575) [using the -h option. This could be a big](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=4&mode=live&start=57.23900000000002) [list, so you can pipe it on the less](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=4&mode=live&start=60.0944375) [command or its Windows equivalent to](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=4&mode=live&start=62.863625) [paginate your way through this list. Take](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=4&mode=live&start=65.1274) [a look at these options and familiarize](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=4&mode=live&start=67.91163636363636) [yourself with them. Don't memorize](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=4&mode=live&start=70.09309090909093) [anything, except for the handy -p1, but](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=4&mode=live&start=71.57133333333333) [just be aware of all the things that you](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=4&mode=live&start=73.47299999999996) [can do with this CLI. One of these options](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=4&mode=live&start=76.57072727272724) [also opens the door to the options of V8](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=4&mode=live&start=79.72385714285716) [itself. Let's explore that list. Using](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=4&mode=live&start=82.53828571428579)[node --v8-options, pipe that on less as](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=4&mode=live&start=85.30883333333333) [well, Node will report all the V8 options](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=4&mode=live&start=89.72466666666662) [that it supports. These options get passed](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=4&mode=live&start=93.48861538461541) [to V8. For example, to make V8 always](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=4&mode=live&start=95.65969230769238) [execute your JavaScript in strict mode,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=4&mode=live&start=98.34350000000003) [you can pass the --use\_strict option. I](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=4&mode=live&start=100.407) [wish this one had a default value of true,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=4&mode=live&start=102.99053846153842) [but unfortunately it does not. However,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=4&mode=live&start=106.39899999999999) [many Node CLI wrappers set this one to](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=4&mode=live&start=108.70833333333333) [true, which I think is great. The V8](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=4&mode=live&start=111.26299999999999) [options are a really big list, and it's](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=4&mode=live&start=113.66715384615384) [mostly for advanced use, but let me tell](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=4&mode=live&start=115.61976923076918) [you a few more things about it. You'll see](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=4&mode=live&start=117.88700000000001) [some options that begin with the word](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=4&mode=live&start=120.48419999999999) [harmony. These flags usually control the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=4&mode=live&start=122.05289999999994) [features that are still being tested. You](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=4&mode=live&start=124.38336363636361) [can use them by including their flags, but](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=4&mode=live&start=127.1886923076923) [just know that they are not final yet.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=4&mode=live&start=129.41023076923082) [You'll see many options for tracing. If](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=4&mode=live&start=132.64339999999996) [you need V8 to give you more debugging](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=4&mode=live&start=136.07686666666666) [power, you can make it up with more](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=4&mode=live&start=138.07579999999996) [information. Some options control how V8](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=4&mode=live&start=140.38972727272727) [behaves and also control its limits. Other](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=4&mode=live&start=142.83390909090912) [options will report information or give](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=4&mode=live&start=145.62254545454547) [you control over what's usually not](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=4&mode=live&start=147.97236363636367) [possible without them. Do a quick scan on](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=4&mode=live&start=151.7115) [this list, but usually if you think you](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=4&mode=live&start=154.45233333333334) [might find a helpful option here, you can](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=4&mode=live&start=155.6240666666667) [grep this list to search for it. For](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=4&mode=live&start=158.39453846153847) [example, you can grep for "in progress" to](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=4&mode=live&start=161.60192857142857) [see all the in progress harmony flags for](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=4&mode=live&start=164.13735714285718) [this particular Node version. In addition](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=4&mode=live&start=167.5652857142857) [to all these flags, the Node CLI also](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=4&mode=live&start=170.8255) [supports some environment variables that](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=4&mode=live&start=174.03550000000004) [you can use to change the process](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=4&mode=live&start=175.96954545454543) [behavior. You can see this list at the end](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=4&mode=live&start=178.6098181818181) [of the -h output. For example, this Node](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=4&mode=live&start=181.32166666666663) [debug environment variable instructs core](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=4&mode=live&start=184.1485555555556)[modules to print out any debug information](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=4&mode=live&start=186.223) [they have. If we execute the Hello World](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=4&mode=live&start=190.1461111111111) [script with Node debug set to HTTP, which](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=4&mode=live&start=193.53084615384608) [is the core module used there, then on](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=4&mode=live&start=196.53758333333332) [each incoming connection, that HTTP module](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=4&mode=live&start=199.4622500000001) [will print out some debugging messages.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=4&mode=live&start=202.02866666666665) [Most Node libraries, including the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=4&mode=live&start=204.968) [packages that you'd install and use,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=4&mode=live&start=206.52618181818175) [support a Node debug flag. You can give](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=4&mode=live&start=208.396) [this environment variable a comma](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=4&mode=live&start=211.03527272727277)[separated list of the modules for which](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=4&mode=live&start=212.8424285714286) [you want to enable debugging. Another](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=4&mode=live&start=215.70342857142867) [handy environment variable is this](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=4&mode=live&start=218.13637500000002) [NODE\_PATH one. By default, Node has](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=4&mode=live&start=220.08325000000002) [certain paths it used to look up modules](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=4&mode=live&start=222.1675384615385) [you require in your code, and you can use](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=4&mode=live&start=224.7786153846155) [this environment variable to override](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=4&mode=live&start=227.96614285714278)[that. I sometimes use this when developing](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=4&mode=live&start=229.75435714285703) [local Node packages because I find it a](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=4&mode=live&start=231.7456363636364) [lot simpler than the alternatives. These](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=4&mode=live&start=234.44612499999997) [are the built-in environment variables,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=4&mode=live&start=236.88418181818182) [but you can have your Node process use any](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=4&mode=live&start=237.9150909090909) [other environment variables as well. Let's talk about that next.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=4&mode=live&start=240.69799999999995)

[The “process” Object](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=5&mode=live)

[You can use the Node command with custom](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=5&mode=live&start=1.29) [environment variables, for example, we can](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=5&mode=live&start=3.546799999999999) [do something like VAL1=10 VAL2=20, note,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=5&mode=live&start=6.2726) [no commas here, then continue to execute a](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=5&mode=live&start=9.515) [Node script like this. In the Node script,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=5&mode=live&start=12.465000000000003) [we can access the values in the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=5&mode=live&start=14.887000000000002) [environment variables using the process](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=5&mode=live&start=16.544250000000005) [object, which has many properties, but the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=5&mode=live&start=18.28411111111111) [one that you can use for this purpose is](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=5&mode=live&start=20.66742857142857) [the env property, which is an object that](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=5&mode=live&start=22.93735714285713) [has all the env properties available](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=5&mode=live&start=24.96566666666667) [through the operating system, like user](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=5&mode=live&start=26.49166666666668) [here, it also includes the one we just](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=5&mode=live&start=28.393499999999996) [customized, like VAL1 and VAL2. You can](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=5&mode=live&start=31.1829) [export environment variables prior to](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=5&mode=live&start=34.5632) [executing a script and Node will read](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=5&mode=live&start=36.48046153846153) [those as well. For example, instead of](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=5&mode=live&start=38.700538461538436) [this one liner, we can do something like](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=5&mode=live&start=40.759333333333345) [export VAL1=100, export VAL2=200, and then](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=5&mode=live&start=42.974) [we can execute this script normally and it](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=5&mode=live&start=49.64054545454547) [will pick up our 100 and 200 values. This](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=5&mode=live&start=56.39763636363635) [is a handy bridge between the operating](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=5&mode=live&start=59.90546153846154) [system and the Node process. You can use](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=5&mode=live&start=62.02969230769232) [it to communicate dynamic configuration](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=5&mode=live&start=65.07733333333334) [values. For example, if you want your](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=5&mode=live&start=67.62788888888892) [script to run on development port 4242,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=5&mode=live&start=70.31415384615389) [but in production you want it to run on](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=5&mode=live&start=72.853) [port 80 instead, you can use process. env](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=5&mode=live&start=75.10959999999996) [to make the port dynamic and control it on](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=5&mode=live&start=77.55461538461537) [different machines. There is another way](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=5&mode=live&start=81.78738461538454) [to pass information for the execution](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=5&mode=live&start=83.716) [context of the Node process and that's](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=5&mode=live&start=85.198) [through the process. argv array. This](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=5&mode=live&start=88.2819090909091) [array will have an item for every](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=5&mode=live&start=90.96658333333333)[positional argument you specify when](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=5&mode=live&start=93.21066666666665) [executing the Node script in order. For](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=5&mode=live&start=94.94385714285714) [example, if we have a Node command to](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=5&mode=live&start=98.09633333333333) [print process. argv, using the handy -p](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=5&mode=live&start=101.675) [CLI option, all the arguments after this](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=5&mode=live&start=104.46966666666668) [command will be set in the resulting array](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=5&mode=live&start=107.01183333333339) [as strings, even if you pass numbers, this](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=5&mode=live&start=109.73830769230773) [array will always assume strings. The](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=5&mode=live&start=112.69771428571427) [first item here in the resulting array is](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=5&mode=live&start=115.23957142857142) [the location of the Node command, and if](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=5&mode=live&start=116.90014285714284) [we're executing a script, the second item](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=5&mode=live&start=118.96325000000002) [in this array would be the script name,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=5&mode=live&start=121.35550000000005) [but in this case we're not executing a](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=5&mode=live&start=123.23392307692309) [script, so the remaining items in this](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=5&mode=live&start=124.99575)[array are the arguments that we passed to](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=5&mode=live&start=127.57000000000001) [the Node command. And they're all strings](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=5&mode=live&start=130.56157142857143) [in this array. This is a cool feature, but](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=5&mode=live&start=133.22257142857143) [I think I prefer the process. env method](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=5&mode=live&start=135.82828571428576) [because I get to name the passed values](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=5&mode=live&start=137.782) [there. With argv, we'd have to do more](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=5&mode=live&start=140.5855555555555) [tricks to accomplish this named values](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=5&mode=live&start=143.84099999999995) [feature. Other properties you should be](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=5&mode=live&start=146.3309999999999) [aware of on this special process object](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=5&mode=live&start=148.8501666666666) [are the standard input output streams.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=5&mode=live&start=151.796) [There are three of them, stdin for input,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=5&mode=live&start=153.5927272727273) [stdout for output, and stderr for error](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=5&mode=live&start=156.70590909090907) [messages. These control the communication](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=5&mode=live&start=160.47636363636357) [channel between the Node process and its](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=5&mode=live&start=162.2966) [operating system execution environment.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=5&mode=live&start=164.72979999999998) [We've been actually using them under the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=5&mode=live&start=166.773) [hood. When you use a console. log line,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=5&mode=live&start=168.57549999999995) [that line writes to the stdout stream. In](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=5&mode=live&start=171.85050000000007) [fact, you can accomplish the same](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=5&mode=live&start=175.16763636363635) [functionality of console. log by using a](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=5&mode=live&start=176.96545454545446) [process. stdout. write line, just like](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=5&mode=live&start=180.72149999999996) [this. Stdin can be used to read](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=5&mode=live&start=185.83649999999992) [information from users. Here's an example](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=5&mode=live&start=189.31766666666667) [to do that. The std I/O objects are all](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=5&mode=live&start=191.53915384615388) [streams, which is a topic that we are yet](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=5&mode=live&start=194.2606153846155) [to explore, but the gist of it is that we](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=5&mode=live&start=196.57953333333342) [use events and methods to use these](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=5&mode=live&start=199.28136363636366) [streams. In here we are listening for a](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=5&mode=live&start=201.46854545454556) [readable event and using the read method](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=5&mode=live&start=203.54069230769227) [to read a chunk of data, and then we print](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=5&mode=live&start=205.32193333333333) [out the same chunk to stdout, making this](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=5&mode=live&start=208.0512666666666) [effectively an echo utility. It will echo](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=5&mode=live&start=211.04000000000005) [everything you type to it. There are](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=5&mode=live&start=214.0442307692308) [multiple ways to consume and benefit from](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=5&mode=live&start=216.62776923076933) [these I/O streams, and streams in general.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=5&mode=live&start=219.3004545454545) [For example, the same echo example can be](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=5&mode=live&start=222.04) [done using the excellent pipe function](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=5&mode=live&start=224.6026666666667) [that's available on readable streams, like](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=5&mode=live&start=226.94699999999997) [process. stdin. We pipe a readable stream](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=5&mode=live&start=230.13599999999994) [into a writeable one, like process.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=5&mode=live&start=233.14274999999995) [stdout, using the argument for the pipe](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=5&mode=live&start=235.47524999999987)[function, and this makes the exact same](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=5&mode=live&start=237.22850000000003) [echo utility. We'll have a bit more to](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=5&mode=live&start=238.93608333333333) [learn about streams later in this course,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=5&mode=live&start=241.68075000000005) [but for now, just make a mental note that](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=5&mode=live&start=243.66015384615386) [streams are awesome and you should utilize](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=5&mode=live&start=245.798) [them in every possible way. Nodes process](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=5&mode=live&start=248.9964166666667) [object can also be used to terminate the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=5&mode=live&start=251.87253846153845) [process or do something when the process](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=5&mode=live&start=254.23869230769225) [is terminate unexpectedly. Here's an](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=5&mode=live&start=257.12942857142866) [example of that, this code has a timer](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=5&mode=live&start=259.02657142857146)[that will fire after 2 seconds and it will](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=5&mode=live&start=260.60485714285727) [call the exit function on the process](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=5&mode=live&start=263.0459230769231) [object. This will manually terminate the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=5&mode=live&start=265.3586153846154) [process and make Node exit. As Node is](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=5&mode=live&start=267.4910000000001) [exiting the process, it looks for any](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=5&mode=live&start=270.28350000000006) [listeners registered on the exit event. We](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=5&mode=live&start=272.59466666666685) [have done exactly that in here, which](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=5&mode=live&start=275.08909090909094) [means right before Node exits, it will](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=5&mode=live&start=277.6363636363637) [execute this function to print out this](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=5&mode=live&start=280.0609090909093) [message. Because of the nature of](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=5&mode=live&start=282.40600000000006) [asynchronous code in Node, this Hello line](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=5&mode=live&start=284.3650000000001) [will be executed first, then the timer](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=5&mode=live&start=286.87800000000004) [will go next, and the exit listener will](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=5&mode=live&start=289.48200000000014) [fire. This simple example demonstrates the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=5&mode=live&start=293.11854545454526) [power of Node asynchronous nature and it's](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=5&mode=live&start=296.0203636363636) [event-based methodology. We will learn](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=5&mode=live&start=299.6476363636362) [more about that in the concurrency module of this course.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=5&mode=live&start=303.684)

[Wrap Up](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=6&mode=live)

[I hope you are now excited about Node.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=6&mode=live&start=0.472) [This module has been just a teaser about](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=6&mode=live&start=2.574857142857143) [the many powerful features that come built](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=6&mode=live&start=5.024153846153847) [into the Node runtime. These include](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=6&mode=live&start=8.076692307692309) [things like it's powerful REPL and CLI,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=6&mode=live&start=10.437333333333333) [and its built-in libraries, like HTTP,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=6&mode=live&start=12.5945) [which we use to quickly create a web](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=6&mode=live&start=14.533499999999998) [server. It also comes with plenty of](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=6&mode=live&start=17.23883333333333) [customizable options and a built-in bridge](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=6&mode=live&start=19.723909090909093) [to the operating system through the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=6&mode=live&start=22.011444444444447) ["process" object. However, we only](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=6&mode=live&start=25.002111111111116) [scratched the surface in this module.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=6&mode=live&start=27.07166666666667) [There are so many other things that I want](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=6&mode=live&start=29.217) [to show you, but before I do, let me make](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=6&mode=live&start=30.787799999999994) [sure that you are familiar with the modern](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=6&mode=live&start=32.872230769230775) [JavaScript features that I'm starting to](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=6&mode=live&start=34.946692307692324) [use and will continue to do throughout](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=6&mode=live&start=36.83028571428571) [this course. This next module will be](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=6&mode=live&start=39.104285714285695) [exactly that, a crash course on all the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=6&mode=live&start=41.45092307692308) [modern JavaScript features that were added](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=6&mode=live&start=44.166) [to the language since 2015 and are now](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=6&mode=live&start=46.64672727272729) [natively available in your Node](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=6&mode=live&start=49.86466666666666) [environment. Features like template](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=6&mode=live&start=51.78244444444442) [strings, array functions, classes, block](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=6&mode=live&start=54.074857142857134) [scopes, destructuring, promises with](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=6&mode=live&start=57.271625) [async/await, and more. If you're already](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=6&mode=live&start=59.87812500000001) [familiar with these features, you should skip this next module.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=0a82b165-b85a-453e-9b09-6d2fd1becdae&clip=6&mode=live&start=64.833)

[Modern JavaScript](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=0&mode=live)

[EcmaScript and TC39](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=0&mode=live)

[JavaScript is a very different language](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=0&mode=live&start=0) [than it used to be just a few years ago.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=0&mode=live&start=3.0981818181818186) [ECMAScript, which is the official](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=0&mode=live&start=7.863) [specification that JavaScript confirms to,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=0&mode=live&start=10.006749999999997) [has improved a lot in the past few years](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=0&mode=live&start=12.075) [after a rather long period of no updates](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=0&mode=live&start=15.594) [to the language at all. Today the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=0&mode=live&start=18.522999999999993)[ECMAScript technical committee, which is](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=0&mode=live&start=21.3396) [known as TC39, makes yearly releases of](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=0&mode=live&start=23.991100000000003) [ECMAScript and JavaScript engines, like](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=0&mode=live&start=27.657999999999994) [V8, shortly follow by implementing the new](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=0&mode=live&start=30.252999999999986) [features introduced in the ECMAScript](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=0&mode=live&start=34.08099999999999) [releases. This has started with ECMAScript](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=0&mode=live&start=36.838499999999975) [2015, or it's other commonly known name,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=0&mode=live&start=39.63961538461539) [ES6. Since then, we've had yearly releases](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=0&mode=live&start=42.789076923076934) [named ES plus the current year. Some of](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=0&mode=live&start=46.017) [these releases were big and others were](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=0&mode=live&start=49.31936363636363) [very small, but the language now has a](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=0&mode=live&start=51.15463636363634) [continuous update cycle that drives more](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=0&mode=live&start=53.84200000000001) [innovative features and fades out the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=0&mode=live&start=56.005)[famous problems JavaScript had over the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=0&mode=live&start=58.3372) [years. Anybody can propose features that](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=0&mode=live&start=61.33533333333333) [they think should belong to the JavaScript](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=0&mode=live&start=63.72238461538462) [language. The TC39 committee has a 5-stage](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=0&mode=live&start=66.05392307692304) [process to filter and finalize the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=0&mode=live&start=68.72800000000004) [features that are considered for the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=0&mode=live&start=71.069) [language. A feature starts at stage 0,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=0&mode=live&start=74.13499999999998) [which is when anyone proposes anything to](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=0&mode=live&start=76.63799999999996) [the committee, and if the proposed feature](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=0&mode=live&start=78.90216666666666) [has a clear problem and a clear case for](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=0&mode=live&start=80.8073333333333) [its need and someone is willing to back it](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=0&mode=live&start=83.24033333333334) [up through the process, it gets labeled as](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=0&mode=live&start=85.66013333333335) [stage 1. Once the proposed feature has an](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=0&mode=live&start=89.37066666666662) [initial spec document, it gets labeled as](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=0&mode=live&start=92.87933333333329) [stage 2, draft. At this point, there is a](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=0&mode=live&start=95.23914285714284) [strong chance the feature will be part of](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=0&mode=live&start=97.70771428571423) [the language. When the spec of the feature](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=0&mode=live&start=100.61711111111111) [is finalized and the designated reviewers](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=0&mode=live&start=103.51800000000003) [of the feature sign off on it, the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=0&mode=live&start=105.666) [proposal is labeled stage 3, a candidate.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=0&mode=live&start=108.80753846153851) [At this stage, the feature is queued for](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=0&mode=live&start=111.46283333333334) [more tests and the committee will accept](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=0&mode=live&start=114.23016666666668) [the spec text into its main specifications](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=0&mode=live&start=116.3788181818182) [repository, which gets the feature to](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=0&mode=live&start=118.57344444444443) [stage 4, finished, and that feature will](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=0&mode=live&start=121.25211111111106) [be included in the next yearly release of](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=0&mode=live&start=124.09714285714286) [ECMAScript. In Node. js, you only have](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=0&mode=live&start=127.22057142857143) [access to features that are finished and](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=0&mode=live&start=129.4636153846154) [are already part of the language. However,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=0&mode=live&start=131.625) [V8 often has harmony flags for you to](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=0&mode=live&start=134.3935) [experiment with candidate and even draft](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=0&mode=live&start=137.72045454545457) [features sometimes. You can also use the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=0&mode=live&start=140.4193636363637) [Babel compiler to write many of the in](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=0&mode=live&start=142.7950714285714) [progress features in JavaScript and have](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=0&mode=live&start=145.15678571428563) [Babel compile it to the good old supported](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=0&mode=live&start=147.00616666666667) [JavaScript before you take your code to](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=0&mode=live&start=149.65544444444444) [production. Babel is popular in the front](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=0&mode=live&start=152.96955555555562)[end because many browsers are usually slow](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=0&mode=live&start=155.01000000000002) [to add support for all the new features in](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=0&mode=live&start=156.888) [the language, including the finalized](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=0&mode=live&start=159.68700000000007) [ones, and Babel offers an escape hatch for](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=0&mode=live&start=161.46399999999997) [developers to use the latest and greatest](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=0&mode=live&start=164.5131818181818) [without risking their code not being](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=0&mode=live&start=166.9924545454545) [compatible with older browsers. In this](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=0&mode=live&start=169.80314285714283) [course, I'll only use features that are](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=0&mode=live&start=172.60849999999996) [natively available in Node. js, including](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=0&mode=live&start=174.2692499999999) [many of the modern features that started](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=0&mode=live&start=176.0299090909091)[becoming available since 2015. In the next](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=0&mode=live&start=178.47736363636363) [few videos, we'll go over some of these](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=0&mode=live&start=180.97600000000006) [features and learn the value they bring to the language.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=0&mode=live&start=185.125)

[Variables and Block Scopes](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=1&mode=live)

[First up, let's talk about variables and](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=1&mode=live&start=1.709) [block scopes. Here is one of my favorite](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=1&mode=live&start=4.894777777777778) [JavaScript trick questions. Is this a](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=1&mode=live&start=8.610999999999997) [valid JavaScript line of code? Testing it](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=1&mode=live&start=11.415214285714283) [in a Node REPL seems to work fine, which](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=1&mode=live&start=14.684714285714279) [means it is valid. So the question is now,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=1&mode=live&start=17.58077777777778) [what did it do? These are nested block](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=1&mode=live&start=21.27371428571428)[scopes. We could write code in here, var a](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=1&mode=live&start=25.866857142857132) [= 42, and then access a right after and it](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=1&mode=live&start=30.06200000000001) [would be acceptable. JavaScript does not](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=1&mode=live&start=34.28633333333334) [really care about the spacing or new lines](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=1&mode=live&start=36.096333333333355) [in here. A block scope is created with a](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=1&mode=live&start=39.43700000000001) [pair of curly braces, just like this](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=1&mode=live&start=43.04806250000002) [example here. This also applies to if](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=1&mode=live&start=45.592125000000046) [statements and for statements as well.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=1&mode=live&start=48.20581818181817) [These also get their own block scopes.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=1&mode=live&start=50.47) [Block scopes are a bit different than](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=1&mode=live&start=52.27366666666666) [function scopes, which are created for](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=1&mode=live&start=54.492999999999995) [each function. You can see one difference](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=1&mode=live&start=57.28599999999999) [when using the var keyword to define](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=1&mode=live&start=60.20507692307692) [variables. Variables defined with var](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=1&mode=live&start=62.98838461538462)[inside a function scope are okay, they](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=1&mode=live&start=64.85959999999999) [don't leak out of that scope. If you try](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=1&mode=live&start=67.41678571428571) [to access them outside of the scope, you](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=1&mode=live&start=70.53785714285715) [can't. As you can see here, we could not](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=1&mode=live&start=72.97071428571427) [access the result variable that was](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=1&mode=live&start=75.32357142857137) [defined inside the sum functions scope.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=1&mode=live&start=78.24772727272727) [However, when we define variables with var](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=1&mode=live&start=81.443) [in a block scope, we can totally access](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=1&mode=live&start=83.7141818181818) [them outside that scope afterward, which](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=1&mode=live&start=86.68142857142857) [is a bit problematic. And here's one](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=1&mode=live&start=89.18557142857142) [practical example of that. This for loop](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=1&mode=live&start=91.94271428571429) [has an index variable that takes from 1 to](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=1&mode=live&start=94.2863076923077) [10. You can access that variable inside](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=1&mode=live&start=96.9662307692308) [the loop normally, but you can also access](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=1&mode=live&start=99.00449999999996) [the same variable outside the loop. After](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=1&mode=live&start=101.91225) [all iterations are done, the value of i](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=1&mode=live&start=105.72738461538462) [here will be reported as 11, and that's a](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=1&mode=live&start=108.23446153846159) [bit weird. This is why the more](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=1&mode=live&start=111.54442857142855) [recommended way to declare variables in](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=1&mode=live&start=114.42342857142853) [modern JavaScript is by using the let](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=1&mode=live&start=116.74033333333331) [keyword instead of the var keyword,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=1&mode=live&start=119.35541666666661)[because when defining variables with let](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=1&mode=live&start=121.75627272727273) [we won't have this weird out of scope](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=1&mode=live&start=124.189) [access problem, if we replace this var](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=1&mode=live&start=126.69238461538467) [here with let and do the same test, we'll](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=1&mode=live&start=128.87646666666666) [try to access let after the loop. We need](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=1&mode=live&start=131.6640666666666) [to start a new Node session here, paste in](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=1&mode=live&start=134.17591666666664) [the code, try to access i after that, it](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=1&mode=live&start=136.58512499999998)[will tell you that i is not defined, which](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=1&mode=live&start=139.40718749999988) [makes sense because we're outside of the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=1&mode=live&start=142.0573333333333) [scope where it was defined. So this is](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=1&mode=live&start=143.95141666666655) [much better. Block scopes, like function](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=1&mode=live&start=147.72822222222217) [scopes, can also be nested, like the trick](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=1&mode=live&start=150.23066666666668) [question that we started with. This is a](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=1&mode=live&start=153.232) [nested block scope. Within each level of](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=1&mode=live&start=157.22327272727264) [nesting, the scope will protect the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=1&mode=live&start=159.85309090909092) [variables defined in it, as long as we use](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=1&mode=live&start=161.5527272727273) [the let keyword or the const keyword,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=1&mode=live&start=164.41306666666674) [which behaves in the good way like the let](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=1&mode=live&start=166.668) [keyword. We use const when the reference](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=1&mode=live&start=170.682) [assigned is meant to be constant because](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=1&mode=live&start=173.14800000000002) [references assigned with const cannot be](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=1&mode=live&start=175.65475) [changed. Note how I'm saying references](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=1&mode=live&start=178.57525) [and not values here because const does not](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=1&mode=live&start=180.99609090909087) [mean immutability, it just means constant](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=1&mode=live&start=183.96766666666667)[reference, but if the reference is for an](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=1&mode=live&start=185.91966666666667) [object, we can still change this object,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=1&mode=live&start=188.32000000000005) [just like we can do with functions that](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=1&mode=live&start=190.395) [receive objects as arguments. So if the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=1&mode=live&start=193.6210000000001) [variable defined with const is a scalar](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=1&mode=live&start=195.75235714285714) [one, like a string or an integer, you can](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=1&mode=live&start=196.9618571428571) [think of it as an immutable thing here](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=1&mode=live&start=199.04085714285716)[because these scalar values in JavaScript](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=1&mode=live&start=201.26142857142864) [are immutable. We can't mutate the value](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=1&mode=live&start=203.79899999999998) [of a string or an integer in JavaScript](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=1&mode=live&start=206.16838461538455) [and because we used const with these](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=1&mode=live&start=208.513) [scalar values, we can't change the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=1&mode=live&start=210.59141666666673) [reference either. However, placing an](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=1&mode=live&start=212.47408333333334) [array or object in a const is a different](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=1&mode=live&start=214.46450000000007) [story. The const will guarantee that the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=1&mode=live&start=218.02075000000002) [variable is pointing to the same array or](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=1&mode=live&start=220.74550000000005) [object, but the content of the array or](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=1&mode=live&start=223.03461538461545) [object can still be mutated. So be careful](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=1&mode=live&start=225.20726666666667) [here and keep that in mind. To accomplish](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=1&mode=live&start=228.48940000000005) [immutability for objects, JavaScript](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=1&mode=live&start=232.14633333333333) [offers a freeze method, but it only](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=1&mode=live&start=234.537)[freezes the first level of that object. So](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=1&mode=live&start=237.61800000000002) [if you have a nested object within the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=1&mode=live&start=240.1659090909091) [first object, that nested object would not](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=1&mode=live&start=242.51718181818188) [freeze. If you want to work with immutable](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=1&mode=live&start=245.16083333333336) [objects, I'd recommend the Immutable. js](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=1&mode=live&start=248.565375) [library, which has an API that will](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=1&mode=live&start=251.723625) [guarantee objects immutability. Variables](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=1&mode=live&start=255.4646666666667) [defined with const are much better than](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=1&mode=live&start=257.4445) [those defined with let for scalar values](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=1&mode=live&start=260.052) [and for functions because you get a](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=1&mode=live&start=262.3549166666666) [guarantee that the value did not](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=1&mode=live&start=264.536) [accidentally change. Looking at this code](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=1&mode=live&start=267.39050000000003) [example here, and assuming that between](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=1&mode=live&start=269.4601818181817) [the first and the last line there is a big](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=1&mode=live&start=271.13745454545426) [program, on the last line we can still](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=1&mode=live&start=273.7660000000002) [confidently say that the answer variable](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=1&mode=live&start=276.25525) [still holds the 42 value because the code](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=1&mode=live&start=278.6237499999999) [ran without problems. While for the same](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=1&mode=live&start=282.4592500000001) [example with let, we would have to parse](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=1&mode=live&start=285.04415384615396) [through the code to figure out if the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=1&mode=live&start=287.03246153846186) [answer variables still hold the 42 value.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=1&mode=live&start=290.0435) [If you need a variable to hold a changing](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=1&mode=live&start=292.806) [scalar value, like a counter, for example,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=1&mode=live&start=294.99709090909084) [then using let is okay, but for the most](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=1&mode=live&start=296.82578571428576) [cases, it's probably much better for you to stick with using const.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=1&mode=live&start=299.241)

[Arrow Functions](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=2&mode=live)

[There are many ways to define a function](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=2&mode=live&start=1.493) [in JavaScript and the modern specification](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=2&mode=live&start=3.6511538461538446) [introduced a new way, arrow functions, a](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=2&mode=live&start=5.4275714285714285) [way to define a function without typing](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=2&mode=live&start=8.341727272727272) [the keyword function, but rather by using](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=2&mode=live&start=10.782818181818177) [an arrow symbol like this. This shorter](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=2&mode=live&start=13.645000000000003) [syntax is preferable, not only because](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=2&mode=live&start=16.685200000000002) [it's shorter, but also because it behaves](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=2&mode=live&start=18.99580000000001) [more predictably with closures. So let me](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=2&mode=live&start=21.832666666666668) [tell you about that. An arrow function](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=2&mode=live&start=24.670571428571424) [does not care who calls it, while a](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=2&mode=live&start=27.44792307692307) [regular function cares very much about](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=2&mode=live&start=30.642384615384596) [that. A regular function, like X here,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=2&mode=live&start=33.04827272727272) [always bind the value for its this keyword](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=2&mode=live&start=35.861) [for its caller, and if it didn't have an](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=2&mode=live&start=38.85128571428573) [explicit caller, a regular function will](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=2&mode=live&start=41.71575000000001) [use a value of undefined for its this](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=2&mode=live&start=42.95925000000002) [keyword. An arrow function, on the other](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=2&mode=live&start=45.34141666666667) [hand, like Y here, not caring about who](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=2&mode=live&start=47.806) [called it, will close over the value for](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=2&mode=live&start=50.76415384615383) [the this keyword for its scope at the time](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=2&mode=live&start=53.76157142857142) [it was defined, making it great for](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=2&mode=live&start=57.20728571428569) [delayed execution cases like events and](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=2&mode=live&start=60.08572727272728) [listeners because it gives easy access to](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=2&mode=live&start=62.621) [the defining environment. This is](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=2&mode=live&start=66.19730000000003) [important, so let's take a look at an](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=2&mode=live&start=68.486) [example. In any Node module, like this](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=2&mode=live&start=71.51) [one, the top level this keyword is](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=2&mode=live&start=73.75123076923074)[associated with the special exports](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=2&mode=live&start=75.925) [object, which I'm going to tell you more](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=2&mode=live&start=77.7940909090909) [about soon, but in this example, I'm just](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=2&mode=live&start=80.69192307692308) [giving this exports object a label to](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=2&mode=live&start=83.31161538461535) [identify it because it's empty by default.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=2&mode=live&start=85.66090909090907) [And here I'm printing the value for the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=2&mode=live&start=88.053) [exports object for you to see. Testing](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=2&mode=live&start=90.93014285714287) [this script with Node command, you should](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=2&mode=live&start=93.57364285714286) [see an object with id exports. Now I](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=2&mode=live&start=96.9731428571429) [prepared this testerObj, which defines two](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=2&mode=live&start=100.9444) [similar functions where in both I am](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=2&mode=live&start=104.1166) [printing the value for the this keyword.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=2&mode=live&start=107.16191666666666) [Function 1 is defined with the regular](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=2&mode=live&start=109.945) [syntax, while function 2 is defined with](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=2&mode=live&start=111.99716666666664) [the arrow syntax. When function 1 is](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=2&mode=live&start=114.3056) [called, it's this keyword will be](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=2&mode=live&start=117.25470000000001) [associated with its caller, which in this](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=2&mode=live&start=119.53724999999997) [case is the tester object itself, and this](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=2&mode=live&start=122.143) [is why you see the printed value for the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=2&mode=live&start=123.99838461538465) [this keyword in function 1, representing](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=2&mode=live&start=126.6891111111111) [the tester object itself. However, when](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=2&mode=live&start=129.00422222222224) [function 2 is called, its this keyword](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=2&mode=live&start=131.41155555555562) [will be associated with the same this](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=2&mode=live&start=133.8506666666667) [keyword that was available in the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=2&mode=live&start=136.142) [function's scope when it was defined,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=2&mode=live&start=138.2834545454545) [which was the module's exports object, the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=2&mode=live&start=140.36983333333333) [one I gave a label, as you can see here.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=2&mode=live&start=142.48266666666657) [This is a big benefit when working with](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=2&mode=live&start=145.8825714285714) [listeners and Node. js, and it's why](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=2&mode=live&start=148.806) [you'll see me using arrow functions all](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=2&mode=live&start=150.46033333333335) [over the place. One other cool thing about](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=2&mode=live&start=152.7088) [arrow functions is that if the function](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=2&mode=live&start=155.69650000000001) [only has a single line that returns](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=2&mode=live&start=157.639) [something, you can make it even more](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=2&mode=live&start=160.12224999999998) [concise by removing the curly braces and](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=2&mode=live&start=163.08092307692309) [the return keyword altogether. You can](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=2&mode=live&start=167.22815384615393) [also remove the parentheses around the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=2&mode=live&start=170.22454545454548) [argument if the function receives a single](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=2&mode=live&start=172.10418181818187) [argument, making it really short. This](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=2&mode=live&start=175.03244444444445) [syntax is usually popular for functions](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=2&mode=live&start=177.84716666666668) [that get passed to array methods, like](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=2&mode=live&start=179.8221666666666) [map, reduce, and filter, and functional programming in general.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=2&mode=live&start=183.468)

[Object Literals](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=3&mode=live)

[You can create an object in JavaScript](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=3&mode=live&start=1.606) [with a few different ways. But the most](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=3&mode=live&start=3.7229166666666673) [common way is to use an object literal.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=3&mode=live&start=6.013090909090908) [Here's an example of that. This is a lot](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=3&mode=live&start=8.088) [easier than doing something like new](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=3&mode=live&start=10.774153846153842) [object, which you can if you want to.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=3&mode=live&start=12.710799999999999) [Literal initiation is very common in](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=3&mode=live&start=15.682)[JavaScript, we use it for objects, arrays,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=3&mode=live&start=17.402909090909084) [strings, numbers, and even things like](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=3&mode=live&start=19.807199999999998) [regular expressions. The object literal](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=3&mode=live&start=22.717799999999993) [syntax supports a few modern goodies.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=3&mode=live&start=24.91933333333333) [Here's a simple example where this object](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=3&mode=live&start=27.382) [defined two regular properties. If you](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=3&mode=live&start=30.401545454545445) [need to define a property that holds a](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=3&mode=live&start=32.541714285714285)[function, you can use this shorter syntax](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=3&mode=live&start=34.200571428571415) [with object literal. Of course, if you](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=3&mode=live&start=36.08850000000001) [need an arrow function, you can still use](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=3&mode=live&start=38.558333333333366) [the regular property syntax. Modern object](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=3&mode=live&start=42.192) [literals also support dynamic properties](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=3&mode=live&start=45.33844444444444) [using this syntax, which looks like an](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=3&mode=live&start=48.32455555555555) [array literal, but don't confuse it with](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=3&mode=live&start=50.51275000000001)[that, JavaScript will evaluate what's](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=3&mode=live&start=51.904) [within the square brackets and make the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=3&mode=live&start=54.72844444444444) [result of that the new property name. So,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=3&mode=live&start=58.28280000000001) [assuming we have a variable named mystery](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=3&mode=live&start=61.761818181818185) [defined before this object, and I'm going](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=3&mode=live&start=64.96654545454547) [to go ahead and copy this code into a Node](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=3&mode=live&start=67.75333333333336) [REPL session, and now here is your](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=3&mode=live&start=71.28666666666675) [JavaScript interview question. What is](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=3&mode=live&start=74.52399999999999) [obj. mystery? It's undefined because this](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=3&mode=live&start=77.254) [mystery property was defined with dynamic](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=3&mode=live&start=81.11800000000004)[property syntax, which means JavaScript](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=3&mode=live&start=84.40359999999998) [will evaluate the mystery expression](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=3&mode=live&start=86.90059999999995) [first, and whatever that expression](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=3&mode=live&start=88.93777777777777) [evaluated to will become the object](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=3&mode=live&start=90.86) [property. In this case, the object will](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=3&mode=live&start=94.05971428571426) [have a property answer with the value of](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=3&mode=live&start=98.2042) [42. Another widely popular feature about](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=3&mode=live&start=103.01913333333333) [object literals is available to you when](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=3&mode=live&start=105.59433333333332) [you need to define an object with property](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=3&mode=live&start=108.11928571428571) [names to map values that exist in the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=3&mode=live&start=110.64271428571426) [current scope with the exact same names.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=3&mode=live&start=113.95358333333331) [If you have a variable named PI and you](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=3&mode=live&start=117.264) [would like obj to have a property named PI](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=3&mode=live&start=119.49540000000002) [as well, holding the same value as the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=3&mode=live&start=122.25176923076921) [variable PI, instead of typing the name](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=3&mode=live&start=125.63515384615377) [twice, like this, you can use the shorter](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=3&mode=live&start=128.0963846153846) [syntax by omitting the second part. And](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=3&mode=live&start=130.681) [this shorter syntax is equivalent to what](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=3&mode=live&start=133.33972727272737) [I had before. Objects are very popular in](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=3&mode=live&start=136.20550000000003) [JavaScript. They are used to manage and](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=3&mode=live&start=139.79616666666675) [communicate data, and using these features](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=3&mode=live&start=142.10500000000002) [will make the code a bit shorter and easier to read.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=3&mode=live&start=143.965)

[Destructuring and Rest/Spread](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=4&mode=live)

[The destructuring syntax is really simple,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=4&mode=live&start=1.714) [but I've seen it confused many people](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=4&mode=live&start=3.3929090909090913) [before. Let me make sure that does not](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=4&mode=live&start=5.424153846153846) [happen to you. Destructuring works for](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=4&mode=live&start=7.952769230769231) [both arrays and objects. Here's an example](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=4&mode=live&start=10.298999999999998) [for objects using the built-in Math object](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=4&mode=live&start=13.428249999999998) [in JavaScript. When you have an object](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=4&mode=live&start=16.380499999999994) [like Math and you want to extract values](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=4&mode=live&start=18.60578571428572) [out of this object into the enclosing](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=4&mode=live&start=20.81664285714287) [scope, for example, instead of using Math.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=4&mode=live&start=22.8685) [PI, you'd like to just have a constant](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=4&mode=live&start=24.894266666666667) [named PI to hold the value of Math. PI,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=4&mode=live&start=26.896400000000014) [which is easy because you can have a line](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=4&mode=live&start=29.116285714285716) [like this for Math. PI and another one for](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=4&mode=live&start=31.271142857142866) [E if you need the same for E, and so on.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=4&mode=live&start=33.45380000000001) [With the destructuring syntax, these three](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=4&mode=live&start=36.736818181818194) [lines are equivalent to this single line.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=4&mode=live&start=39.408454545454575) [It destructures the three properties out](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=4&mode=live&start=42.770999999999994) [of its right-hand object and into the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=4&mode=live&start=45.7442) [current scope. This is useful when you](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=4&mode=live&start=49.25259999999998) [need to use a few properties out of a](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=4&mode=live&start=51.64562500000002) [bigger object. For example, here's a line](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=4&mode=live&start=54.14875000000004) [to destructure just the read file method](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=4&mode=live&start=56.37583333333334) [out of the Node's fs module. After this](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=4&mode=live&start=58.715)[line, I can use the readFile method](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=4&mode=live&start=62.0167142857143) [directly like this. Destructuring also](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=4&mode=live&start=65.21539999999999) [works inside function arguments. If the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=4&mode=live&start=68.82739999999995) [argument passed to a function is an](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=4&mode=live&start=72.24146153846154) [object, instead of using the name of the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=4&mode=live&start=74.07707692307692) [object every time you want to access its](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=4&mode=live&start=76.39184615384616) [properties, you can use the destructuring](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=4&mode=live&start=78.92353846153847)[syntax within the function parentheses to](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=4&mode=live&start=81.03549999999998) [destructure just the properties that you](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=4&mode=live&start=83.11575) [are interested in and make them local to](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=4&mode=live&start=84.82425000000002) [that function. This generally improves the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=4&mode=live&start=87.79350000000002) [readability of functions. So here we have](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=4&mode=live&start=90.88450000000006) [a circleArea function, which expects an](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=4&mode=live&start=93.65000000000003) [object as its argument and it expects that](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=4&mode=live&start=95.48000000000008) [object to have a radius property and we're](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=4&mode=live&start=98.155) [destructuring the radius property out of](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=4&mode=live&start=100.828) [that object and using it locally in the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=4&mode=live&start=102.65200000000002)[function. If we call this circleArea](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=4&mode=live&start=105.71300000000001) [function with an object like circle, it](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=4&mode=live&start=108.166) [will use its radius property inside for](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=4&mode=live&start=110.84641666666661) [its calculation. Let's go ahead and test](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=4&mode=live&start=113.7604) [that. You'll see the circleArea](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=4&mode=live&start=117.25830000000003) [calculation working as expected.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=4&mode=live&start=120.91499999999998) [Destructured arguments can also be defined](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=4&mode=live&start=124.072) [with defaults, like regular arguments. If](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=4&mode=live&start=126.21174999999997) [say, I'd like to use a default value of 2](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=4&mode=live&start=128.01266666666666) [for a precision property here, let's](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=4&mode=live&start=131.3861818181818) [define second options are given for this](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=4&mode=live&start=134.98072727272722)[circleArea function and destructure](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=4&mode=live&start=138.72822222222223) [precision out of that argument to use it](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=4&mode=live&start=140.67844444444447) [in the functions body. If I'd like to use](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=4&mode=live&start=143.63000000000002) [a default value of 2 for the precision](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=4&mode=live&start=146.32835714285721) [property, I can just use the equal sign](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=4&mode=live&start=148.39292857142874) [here after destructuring precision and](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=4&mode=live&start=150.85345454545458) [that means default for precision, if not](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=4&mode=live&start=152.55508333333333) [specified, will be 2. I can also make this](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=4&mode=live&start=155.65666666666667) [whole second argument optional using an](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=4&mode=live&start=158.8656666666666) [equal sign after the destructuring syntax.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=4&mode=live&start=160.58966666666655) [The same call here will use an empty](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=4&mode=live&start=162.98241666666672) [object for the second argument of the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=4&mode=live&start=166.18307692307692) [function, and then it will use a default](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=4&mode=live&start=167.95461538461535) [value of 2 for the precision property that](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=4&mode=live&start=170.28178571428575) [is now used in the function. Of course, if](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=4&mode=live&start=173.1132142857144) [you called the circleArea function with a](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=4&mode=live&start=176.07809090909086) [second argument that has a precision](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=4&mode=live&start=178.43316666666664) [property, that value will be used inside](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=4&mode=live&start=180.74066666666658) [the function. As you can see, this](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=4&mode=live&start=183.34266666666664) [destructuring feature offers a good](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=4&mode=live&start=185.8919) [alternative to using named arguments and](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=4&mode=live&start=188.00139999999996)[functions, which is a much better thing](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=4&mode=live&start=190.4935714285714) [than relying on positional arguments.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=4&mode=live&start=193.3095714285714) [Destructuring, whether you do it in](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=4&mode=live&start=195.321) [function arguments or directly with](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=4&mode=live&start=197.5452) [variables, also works for arrays. If you](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=4&mode=live&start=199.44253846153845) [have an array of values and you want to](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=4&mode=live&start=202.34430769230764) [extract these values into local variables,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=4&mode=live&start=205.55761538461533) [you can use the items positions to](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=4&mode=live&start=207.26853846153833) [destructure their values into local](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=4&mode=live&start=209.90439999999998) [variables, just like this. Note how I used](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=4&mode=live&start=212.12989999999996) [double commas here to skip destructuring](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=4&mode=live&start=214.58225000000007) [the third item in the array. The](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=4&mode=live&start=216.35957142857143) [destructured variable fourth here will](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=4&mode=live&start=218.9752727272727) [hold the value of 40. This is useful when](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=4&mode=live&start=221.7466363636363) [combined with the rest operator, which has](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=4&mode=live&start=225.9145714285714) [an example here. By using these three](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=4&mode=live&start=228.35857142857137) [dots, we are asking JavaScript to](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=4&mode=live&start=230.52381818181817) [destructure only one item out of this](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=4&mode=live&start=232.20054545454542)[array and then create a new array under](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=4&mode=live&start=234.18014285714284) [the name restOfItems to hold the rest of](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=4&mode=live&start=236.447) [the items after removing the first one.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=4&mode=live&start=239.80033333333324) [Let's test that. So first here will be 10,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=4&mode=live&start=242.86674999999997) [and restOfItems will be an array of 20,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=4&mode=live&start=247.036) [30, and 40. This is powerful for splitting](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=4&mode=live&start=250.76254545454543) [the array, and it's also even more](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=4&mode=live&start=253.58333333333337)[powerful when working with objects to](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=4&mode=live&start=255.576) [filter out certain properties from an](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=4&mode=live&start=258.0894) [object. Here is an example of that, say](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=4&mode=live&start=260.28714285714284) [that we have this data object, which has a](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=4&mode=live&start=262.37571428571425) [few temp properties, and we'd like to](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=4&mode=live&start=264.97346153846155) [create a new object that has the same data](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=4&mode=live&start=267.1483076923077) [except for temp1 and temp2. We can](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=4&mode=live&start=271.2516153846156)[destructure temp1 and temp2 and then use](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=4&mode=live&start=274.4413333333334) [the rest operator to get the remaining](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=4&mode=live&start=277.30900000000014) [properties into a new object called](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=4&mode=live&start=280.35400000000004) [person. Just like the three dots of rest,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=4&mode=live&start=283.0780000000001) [you can use the three dots to spread one](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=4&mode=live&start=285.5685333333333) [array or object into a new array or](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=4&mode=live&start=288.19910000000004) [object. This is useful for copying arrays](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=4&mode=live&start=290.6238999999998) [and objects. You can spread the items in](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=4&mode=live&start=293.8377499999999) [an array into a newArray like this](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=4&mode=live&start=296.80342857142864) [example. NewArray here will be a copy of](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=4&mode=live&start=299.1314285714287) [the rest of items array that we](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=4&mode=live&start=301.3531250000001) [destructured above. And similarly, you can](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=4&mode=live&start=303.2422500000002) [also spread the key value pairs of an](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=4&mode=live&start=304.8669230769231) [object into a newObject, like this](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=4&mode=live&start=307.0367692307694) [example. The newObject here will be a copy](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=4&mode=live&start=309.06258333333324) [of the person object. Note that these](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=4&mode=live&start=311.90507692307693) [copies are also shallow copies. Any nested](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=4&mode=live&start=314.6076153846154) [objects or arrays will be shared between these copies. Don't forget that.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=4&mode=live&start=317.2930909090909)

[Template Strings](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=5&mode=live)

[Template strings are one of my favorite](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=5&mode=live&start=1.835) [new features that were introduced to the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=5&mode=live&start=3.3088181818181805) [JavaScript language a few years ago. Let](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=5&mode=live&start=5.283) [me tell you about them. You can define a](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=5&mode=live&start=7.776166666666667) [string in JavaScript using either single](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=5&mode=live&start=10.302285714285713) [quotes or double quotes. These two ways to](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=5&mode=live&start=12.372714285714281) [define string literals in JavaScript are](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=5&mode=live&start=15.492272727272727) [equivalent. Modern JavaScript has a third](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=5&mode=live&start=18.101181818181825) [way to define strings, and that's using](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=5&mode=live&start=20.28975000000001) [the back tick character. On my keyboard,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=5&mode=live&start=22.745)[it's right above the Tab key. Strings](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=5&mode=live&start=25.904153846153857) [defined within the back tick character are](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=5&mode=live&start=28.8859) [called template strings because they can](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=5&mode=live&start=30.803200000000007) [be used as a template with dynamic values](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=5&mode=live&start=32.94066666666666) [as they support what we call](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=5&mode=live&start=36.12) [interpolation. You can inject any dynamic](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=5&mode=live&start=38.88) [expression in JavaScript within these](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=5&mode=live&start=41.21249999999999)[dollar sign curly braces holders. So for](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=5&mode=live&start=43.085) [example, we can use Math. random here, and](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=5&mode=live&start=45.552818181818196) [the final string will have the value of](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=5&mode=live&start=48.495615384615384) [the expression included exactly where it](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=5&mode=live&start=51.56084615384615) [was injected in the string. If you test](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=5&mode=live&start=54.0405) [this string in Node, you'll see a random](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=5&mode=live&start=57.105357142857144) [value every time you do it. With template](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=5&mode=live&start=59.68764285714286) [strings, you can also have multi-lines in](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=5&mode=live&start=63.48327272727271) [the strings, something that was not](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=5&mode=live&start=67.39061538461539) [possible with the regularly quoted](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=5&mode=live&start=70.47830769230768) [strings. Back ticks look very similar to](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=5&mode=live&start=73.05138461538459) [single quotes, so make sure to train your](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=5&mode=live&start=74.82461538461536) [eyes to spot template strings when they are used in examples.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=5&mode=live&start=77.293)

[Classes](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=6&mode=live)

[JavaScript offers many programming](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=6&mode=live&start=1.294) [paradigms, and object-oriented programming](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=6&mode=live&start=3.093428571428571) [is one of them. Everything in JavaScript](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=6&mode=live&start=4.890538461538461) [is an object, including functions. Modern](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=6&mode=live&start=8.023307692307691) [JavaScript also added support for the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=6&mode=live&start=10.67175) [class syntax, a class is a template or](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=6&mode=live&start=13.13625) [blueprint for you to define shared](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=6&mode=live&start=16.360545454545452)[structure and behavior between similar](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=6&mode=live&start=18.701636363636368) [objects. You can define new classes, make](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=6&mode=live&start=21.753749999999997) [them extend other classes, and instantiate](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=6&mode=live&start=23.92460000000001) [objects out of them using the new keyword.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=6&mode=live&start=25.6168) [You can customize the construction of](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=6&mode=live&start=28.616) [every object and define shared functions](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=6&mode=live&start=30.674545454545445) [between these objects. Here is a standard](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=6&mode=live&start=32.9365) [class example that demonstrate all these](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=6&mode=live&start=36.762000000000015) [features. We have a Person class and a](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=6&mode=live&start=39.32999999999999) [Student class that extends the Person](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=6&mode=live&start=42.28)[class. Every student is also a person.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=6&mode=live&start=45.10685714285715) [Both classes define a constructor](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=6&mode=live&start=48.09950000000002) [function. The constructor function is a](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=6&mode=live&start=50.200750000000035) [special one that gets called every time we](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=6&mode=live&start=52.31474999999999) [instantiate an object out of the class,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=6&mode=live&start=54.93742857142857) [which we do using the new keyword, as you](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=6&mode=live&start=56.69742857142855) [can see here. We are instantiating one](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=6&mode=live&start=59.260749999999994)[object from the Person class and two other](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=6&mode=live&start=61.72183333333331) [objects from the Student class. The](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=6&mode=live&start=64.86590909090908) [arguments we pass here when we instantiate](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=6&mode=live&start=67.21209090909092) [these objects are accessible in the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=6&mode=live&start=69.3967272727273) [classes constructor function. The Person](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=6&mode=live&start=72.15950000000001) [class expects a name argument, it stores](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=6&mode=live&start=74.60169230769232) [the value on the instance using the this](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=6&mode=live&start=76.75661538461542) [keyword here, and the Student class](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=6&mode=live&start=79.84254545454547) [expects name and the level arguments. It](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=6&mode=live&start=82.62436363636368) [stores the level value on its instance and](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=6&mode=live&start=85.15999999999997) [since it extends the Person class, it'll](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=6&mode=live&start=88.00583333333333) [call the super method with the name](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=6&mode=live&start=90.71424999999998) [argument, which will invoke the Person](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=6&mode=live&start=93.31136363636364) [class constructor function and store the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=6&mode=live&start=95.4659090909091) [name as well. Both classes define a greet](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=6&mode=live&start=98.283125) [function that uses the values they store](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=6&mode=live&start=101.28799999999998) [on each instance. On the third object,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=6&mode=live&start=103.43) [which we instantiated from the Student](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=6&mode=live&start=106.15554545454549) [class here, we also defined a greet](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=6&mode=live&start=108.60772727272726) [function directly on the object. When we](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=6&mode=live&start=111.73927272727269) [test this script, o1 will use the greet](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=6&mode=live&start=114.68114285714289) [method from its class, the Person class,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=6&mode=live&start=117.95657142857151) [o2 will use the greet method from the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=6&mode=live&start=120.65938461538464) [Student class, and o3 will use its own directly defined greet method.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=6&mode=live&start=124.335)

[Promises and Async/Await](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=7&mode=live)

[Node is event driven. Most of the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=7&mode=live&start=1.89) [functions that you'll be working with in](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=7&mode=live&start=3.567083333333334) [Node return promises, and you'll have to](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=7&mode=live&start=5.38) [consume them using the promise syntax](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=7&mode=live&start=7.532500000000001) [with. then and. catch. However, a more](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=7&mode=live&start=9.722090909090909) [preferable way to consume promises is](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=7&mode=live&start=12.678636363636363) [using the new async/await syntax, which](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=7&mode=live&start=15.413000000000004)[makes your promise consuming code a bit](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=7&mode=live&start=18.019636363636366) [more readable and easier, especially when](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=7&mode=live&start=20.082090909090915) [you start dealing with loops and other](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=7&mode=live&start=22.179090909090913) [complexities. Here's an example code that](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=7&mode=live&start=25.009636363636375) [is consuming a Promise object using the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=7&mode=live&start=26.726499999999998) [regular Promise syntax. Here we have a](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=7&mode=live&start=28.564) [simple fetch function that reads an HTTPS](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=7&mode=live&start=31.01781818181818) [response for a URL. Don't worry about the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=7&mode=live&start=33.40672727272728) [implementation of this function, just](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=7&mode=live&start=36.038) [notice how it returns a Promise object.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=7&mode=live&start=38.21300000000001)[This is a modern alternative to using](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=7&mode=live&start=41.258) [callbacks for the async nature of this](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=7&mode=live&start=43.41633333333331) [function. To consume the fetch function,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=7&mode=live&start=45.67516666666667) [we use the. then syntax, which will expose](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=7&mode=live&start=47.82666666666668) [the data available after the async action.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=7&mode=live&start=50.99990909090909) [Alternatively, we can also consume any](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=7&mode=live&start=54.043) [promise using the async/await feature as](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=7&mode=live&start=56.9134) [seen here. We use the keyword await before](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=7&mode=live&start=59.52799999999999) [the promise and that will give us access](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=7&mode=live&start=62.331999999999965) [to the data available after the async](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=7&mode=live&start=64.97314285714288) [action. We can use this data directly](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=7&mode=live&start=67.23664285714291) [after the await line, just like this,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=7&mode=live&start=69.37015384615384) [which is a lot simpler than callbacks and](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=7&mode=live&start=71.482) [using. then as well. However, to make this](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=7&mode=live&start=74.15466666666671) [await feature work, you have to wrap your](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=7&mode=live&start=76.69346153846153) [code with a function labeled with the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=7&mode=live&start=79.0983846153846) [async keyword and then call the function](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=7&mode=live&start=81.42699999999996) [to execute the async action. Testing this](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=7&mode=live&start=84.0192) [code now, the same fetch promise will be](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=7&mode=live&start=87.9686) [consumed twice, once with the regular.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=7&mode=live&start=91.06500000000001) [then syntax, and another time with the new](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=7&mode=live&start=93.5763) [async/await syntax. The async/await syntax](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=7&mode=live&start=97.92270000000002) [is definitely easier to read and it will](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=7&mode=live&start=99.41372727272726) [make your life especially easier if you](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=7&mode=live&start=101.941) [need to work with promises that depend on](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=7&mode=live&start=103.76216666666664) [each other or promises that need to be within the loop.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=7&mode=live&start=108.063)

[Wrap Up](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=8&mode=live)

[This module was as quick review of the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=8&mode=live&start=1.251) [modern JavaScript features that were](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=8&mode=live&start=3.502636363636365) [introduced to the language in the past few](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=8&mode=live&start=4.8733076923076935) [years and are currently available natively](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=8&mode=live&start=6.978538461538466) [in Node. We've talked about block scopes](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=8&mode=live&start=8.978800000000001) [and how they are a bit different than](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=8&mode=live&start=11.804) [function scopes and how it's wise to use](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=8&mode=live&start=13.926461538461536) [the let and const keyword within them.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=8&mode=live&start=16.4035) [We've seen how arrow functions are](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=8&mode=live&start=19.088) [different than regular functions. We've](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=8&mode=live&start=20.9996) [explored the modern ways to work with](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=8&mode=live&start=22.59166666666667) [object literals and talked about](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=8&mode=live&start=24.815333333333342) [destructuring and the rest/spread](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=8&mode=live&start=26.6575) [properties. We saw how to work with](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=8&mode=live&start=28.9435)[template strings and how to create and use](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=8&mode=live&start=31.36857142857142) [classes, and finally, saw an example of](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=8&mode=live&start=33.84) [consuming promises with regular promise](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=8&mode=live&start=36.846499999999985) [syntax and with the async/await as well.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=8&mode=live&start=38.99033333333333) [In the next module, we'll explore the npm](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=8&mode=live&start=41.984) [tool. Npm is Node's Package Manager and it](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=8&mode=live&start=45.14666666666667) [has a website hosting hundreds of](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=8&mode=live&start=47.93075000000002) [thousands of Node packages. We'll explore](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=8&mode=live&start=50.03627272727273) [the npm tool itself and talk about some of the most popular npm packages out there.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=06c2caf9-7c4c-4c7f-bb9b-4ba203eab02b&clip=8&mode=live&start=52.431909090909116)

[NPM: Node Package Manager](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=0&mode=live)

[What Exactly Is NPM?](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=0&mode=live)

[Welcome back. Let's talk about npm, Node's](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=0&mode=live&start=0) [Package Manager. Npm enables JavaScript](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=0&mode=live&start=4.812888888888889) [developers to do three main things, share](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=0&mode=live&start=8.016333333333334) [their code with others, re-use their own](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=0&mode=live&start=12.141545454545454) [code across projects, and use code written](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=0&mode=live&start=15.421363636363635) [by others in their projects. So npm is](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=0&mode=live&start=18.41366666666666) [basically all about code sharing and](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=0&mode=live&start=21.636899999999997) [reusability. If you have a piece of](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=0&mode=live&start=24.116699999999994) [JavaScript code that you'd like to share](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=0&mode=live&start=25.747999999999998) [with others or just re-use in other](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=0&mode=live&start=27.168999999999993) [projects, npm is the tool you need to help](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=0&mode=live&start=29.337428571428568) [with that. But npm is also about](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=0&mode=live&start=32.28218181818182) [composability of bigger applications using](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=0&mode=live&start=34.55145454545456) [smaller packages. You can use others work](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=0&mode=live&start=36.47200000000001) [to complete yours, so you don't have to](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=0&mode=live&start=39.790000000000035) [start from complete scratch. In general,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=0&mode=live&start=42.80372727272729) [npm is an asset for any team that is](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=0&mode=live&start=44.72342857142858) [working on any JavaScript project, it](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=0&mode=live&start=46.831357142857165) [makes it easy to separate and manage the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=0&mode=live&start=48.62136363636364) [different versions of code. The npm](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=0&mode=live&start=51.521) [project runs at npmjs. com. This is the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=0&mode=live&start=54.83814285714285) [site that hosts the many useful npm](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=0&mode=live&start=57.21071428571425) [packages that you're going to love and](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=0&mode=live&start=59.65590909090909) [appreciate. It also hosts a lot of empty](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=0&mode=live&start=62.59336363636364) [and useless packages because there is no](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=0&mode=live&start=64.42599999999999) [quality control here. Anyone can publish](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=0&mode=live&start=65.839) [anything. And we are about to publish](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=0&mode=live&start=69.787) [something in this module, but I'll try to](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=0&mode=live&start=71.65192307692305) [make it a bit useful. Npm is the official](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=0&mode=live&start=73.51876923076924) [Node package manager. The npm project](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=0&mode=live&start=77.64769230769235) [started with a small set of Node scripts](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=0&mode=live&start=79.93900000000002) [to manage common tasks around folders that](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=0&mode=live&start=82.37900000000008) [contain code for Node, and it since](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=0&mode=live&start=84.91691666666665) [evolved into a fully featured package](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=0&mode=live&start=87.616) [manager that is super useful for all](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=0&mode=live&start=90.25109090909093) [JavaScript code, not just Node. If you](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=0&mode=live&start=93.05850000000001) [browse the registry of the npm packages](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=0&mode=live&start=95.19875000000003) [that are hosted on npmjs. com, you'll find](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=0&mode=live&start=97.9569230769231)[packages that are for Node and packages](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=0&mode=live&start=101.63876923076931) [that are libraries and frameworks, meant](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=0&mode=live&start=104.03699999999996) [to be used in a browser or a mobile](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=0&mode=live&start=105.90745454545454) [application. If you dig deep enough,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=0&mode=live&start=108.2065454545454) [you'll even see examples of apps for](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=0&mode=live&start=109.86700000000003) [robots, routers, and countless other](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=0&mode=live&start=111.83400000000007) [places where JavaScript can be executed. A](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=0&mode=live&start=113.95100000000001)[typical Node project will have tens, if](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=0&mode=live&start=117.1815) [not hundreds, of npm packages. Some npm](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=0&mode=live&start=120.51700000000001) [packages represent big frameworks, like](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=0&mode=live&start=123.84944444444444) [express or sales. Some provide utility](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=0&mode=live&start=126.2995) [functions, like lodash here. Some just](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=0&mode=live&start=129.5785) [provide useful libraries, the request](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=0&mode=live&start=132.64437499999997) [package here is an example of that. Many](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=0&mode=live&start=134.80733333333336) [npm packages are small and specialize](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=0&mode=live&start=137.511) [around one problem and focused on how to](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=0&mode=live&start=140.05500000000004) [solve that problem well. Let's give credit](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=0&mode=live&start=143.57588888888884) [where credit is due. Npm simply](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=0&mode=live&start=146.4664) [revolutionized the way JavaScript](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=0&mode=live&start=148.64919999999998) [developers work. The life of a JavaScript](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=0&mode=live&start=150.3216) [developer was much harder before npm. Npm](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=0&mode=live&start=153.375) [is a very important part of Node and a](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=0&mode=live&start=156.1225000000001) [good understanding of how it works will](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=0&mode=live&start=159.09486666666666) [prove to be very valuable for you as a](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=0&mode=live&start=160.8621333333333) [Node developer. So what exactly is a](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=0&mode=live&start=164.487) [package manager and why do we need it?](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=0&mode=live&start=167.0887692307692) [Let's actually start with a more basic](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=0&mode=live&start=169.578) [question, what is a package? The name](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=0&mode=live&start=171.92708333333326) [package is what npm uses to label the bits](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=0&mode=live&start=174.37914285714285) [of reusable code. A Node package is](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=0&mode=live&start=177.86278571428574) [basically a folder that contains scripts](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=0&mode=live&start=180.13533333333328) [that can be run by Node, which is to say](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=0&mode=live&start=181.8023333333332) [that any folder that has some JavaScript](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=0&mode=live&start=184.40257142857155) [code in it is basically a Node package.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=0&mode=live&start=186.33955555555556) [Another name that is commonly used to](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=0&mode=live&start=189.568) [describe a code folder in Node is module.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=0&mode=live&start=192.52480000000008) [Some modules are built in Node, so npm is](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=0&mode=live&start=195.904) [not needed to manage those, but most other](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=0&mode=live&start=198.67214285714292) [modules that you'll be using are external](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=0&mode=live&start=201.1615) [to Node and npm is what we can use to](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=0&mode=live&start=203.38166666666655) [manage them. When you have a project that](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=0&mode=live&start=206.68559999999994) [has a lot of these code folders that we](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=0&mode=live&start=208.68460000000005) [are going to start referring to as](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=0&mode=live&start=210.682) [packages from now on, you'll need to](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=0&mode=live&start=213.08745454545453) [manage them somehow, especially when these](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=0&mode=live&start=215.5561) [packages start depending on other](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=0&mode=live&start=217.74429999999998) [packages, and when you start working with](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=0&mode=live&start=219.14499999999995) [multiple versions and sources of these](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=0&mode=live&start=220.958) [packages. That's where npm can be helpful.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=0&mode=live&start=223.66142857142862) [When developers talk about npm, they can](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=0&mode=live&start=227.528) [be talking about one of many things. They](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=0&mode=live&start=229.86100000000005) [can be talking about the npmjs website](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=0&mode=live&start=232.44533333333334) [that hosts a public registry of the many](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=0&mode=live&start=234.20466666666658) [open source npm packages. This website](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=0&mode=live&start=236.58350000000004)[provides a few graphical features like](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=0&mode=live&start=238.8134) [searching for packages, for example. Every](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=0&mode=live&start=241.38260000000002) [package page has some meta information](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=0&mode=live&start=243.97980000000004) [about the package, like the number of](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=0&mode=live&start=246.591) [downloads and other information managed by](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=0&mode=live&start=249.07790909090915) [the package. If the package has a read me](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=0&mode=live&start=251.13366666666664) [file, it'll be displayed here as well.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=0&mode=live&start=253.98966666666655) [Developers could also be talking about the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=0&mode=live&start=257.345) [npm command line interface, the CLI tool](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=0&mode=live&start=259.41127272727255) [that we can use in our projects to manage](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=0&mode=live&start=261.5837142857143) [the packages. This tool has many commands](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=0&mode=live&start=264.55885714285716) [that you can see here. We are going to](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=0&mode=live&start=266.53450000000004) [learn a few of them in this course module.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=0&mode=live&start=268.8930000000001)[Npm is also the name of the company, npm,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=0&mode=live&start=271.242) [Inc, that hosts and maintains the npm](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=0&mode=live&start=273.8443846153847) [registry and CLI tool, and is doing more](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=0&mode=live&start=276.0502499999999) [business around the npm registry and tool.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=0&mode=live&start=278.84824999999967) [They offer private repositories and more](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=0&mode=live&start=281.24890909090925) [enterprise level services. Let's now talk](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=0&mode=live&start=283.716) [about the npm CLI tool that gives us this global npm command.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=0&mode=live&start=288.99)

[The NPM Command](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=1&mode=live)

[As a Node developer, you will be working](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=1&mode=live&start=1.466) [with the npm command a lot. This command](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=1&mode=live&start=3.9580000000000006) [comes installed with Node itself, so you](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=1&mode=live&start=6.2829999999999995) [don't need to do anything to install it.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=1&mode=live&start=7.878999999999998) [If you have Node installed, you should](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=1&mode=live&start=10.070500000000003) [have the global npm command installed as](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=1&mode=live&start=12.1812) [well. You can check the version with -v.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=1&mode=live&start=14.292400000000004) [Npm gets updated more frequently than](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=1&mode=live&start=17.299500000000005) [Node, so sometimes you might need to](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=1&mode=live&start=19.601416666666665) [update npm itself separately from Node to](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=1&mode=live&start=22.187333333333328) [get the latest release. You do that using](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=1&mode=live&start=24.61415384615384) [the command npm install -g, for global,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=1&mode=live&start=27.14523076923075) [npm. Yep, you can use npm to update npm.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=1&mode=live&start=30.371928571428562) [If you get an EACCESS error here, that](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=1&mode=live&start=35.041) [means you most likely installed Node](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=1&mode=live&start=37.796076923076896) [itself with some admin privileges. You can](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=1&mode=live&start=39.853846153846156) [use sudo in that case or start a whole](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=1&mode=live&start=42.204769230769244) [terminal with admin privileges. On Mac OS,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=1&mode=live&start=45.513999999999996) [if you install Node through Homebrew or](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=1&mode=live&start=48.222090909090916) [NVM, you usually don't need to sudo any](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=1&mode=live&start=50.73763636363639)[Node or npm commands. If you are facing an](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=1&mode=live&start=53.41400000000002) [EACCESS error, you can also fix the npm](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=1&mode=live&start=56.22800000000001) [permissions so that you don't have to run](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=1&mode=live&start=58.612) [npm with sudo. There's an article in the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=1&mode=live&start=61.185818181818185) [npmjs documentation site, right here, that](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=1&mode=live&start=64.03450000000001) [has some details on that. Let's quickly](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=1&mode=live&start=66.46466666666667) [explore the first command of npm, the one](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=1&mode=live&start=69.812) [that we just used, install. To do that,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=1&mode=live&start=72.26800000000001) [I'm going to create a test directory,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=1&mode=live&start=74.78509090909093) [test-npm, cd into that, and run npm](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=1&mode=live&start=77.07663636363642) [install, and by the way, install has a](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=1&mode=live&start=79.84214285714287) [shortcut, you can just do npm i, which is](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=1&mode=live&start=83.093) [cool. And we're going to install one](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=1&mode=live&start=86.07560000000002) [package called express. So this npm](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=1&mode=live&start=89.54166666666667)[install command is our client that just](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=1&mode=live&start=92.12872727272726) [downloaded the package from its source,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=1&mode=live&start=94.50809090909088) [which by default is the npmjs. com](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=1&mode=live&start=96.95508333333336) [registry itself, but you can configure the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=1&mode=live&start=99.905) [command for other sources. And after it](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=1&mode=live&start=101.98272727272727) [downloaded that package, npm placed the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=1&mode=live&start=104.21775) [package in a special folder under the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=1&mode=live&start=106.31324999999998) [project named node\_modules. So this is the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=1&mode=live&start=109.31471428571429) [process that's known as installed a](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=1&mode=live&start=112.09781818181816) [package, but there is nothing magic about](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=1&mode=live&start=114.07454545454539) [it really, it just places the package](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=1&mode=live&start=116.03230769230771) [under this node\_modules oflder. Node](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=1&mode=live&start=117.932) [itself is designed to use this](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=1&mode=live&start=120.35245454545455) [node\_modules folder by default to look for](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=1&mode=live&start=123.257) [any packages it needs to use. When Node](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=1&mode=live&start=126.20023076923077) [needs to require a package, like express](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=1&mode=live&start=129.29438461538462) [here, it does not communicate with npm at](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=1&mode=live&start=131.29423076923072) [all, it just uses the node\_modules folder](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=1&mode=live&start=134.1548181818182) [and the packages that were placed inside](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=1&mode=live&start=137.161) [that node\_modules folder. Did you notice](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=1&mode=live&start=140.7421999999999) [how when I installed the express package](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=1&mode=live&start=143.15545454545452) [here, npm warned me that this folder does](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=1&mode=live&start=145.20518181818176) [not have a package. json file? This](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=1&mode=live&start=148.35884615384623) [package. json file is important. So let's](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=1&mode=live&start=151.16527272727274) [redo this example with a package. json](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=1&mode=live&start=153.64518181818184) [file. I have a folder in the 3-npm folder](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=1&mode=live&start=157.08319999999995) [here called 1-npm-command, and this folder](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=1&mode=live&start=161.06536363636368) [has the package. json file. So let's cd](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=1&mode=live&start=163.19662500000004) [into this folder and redo the npm install](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=1&mode=live&start=165.95976923076924) [express command and note what happens to](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=1&mode=live&start=169.50315384615388) [the package. json file. Did you see that?](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=1&mode=live&start=173.2195555555555) [The package. json file had a new section](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=1&mode=live&start=176.46184615384615) [here. This is the section where npm is](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=1&mode=live&start=178.41753846153844) [documenting this new dependency for this](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=1&mode=live&start=181.30036363636367)[project, express. And not only that, the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=1&mode=live&start=183.48909090909092) [npm install process will also take care of](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=1&mode=live&start=185.87290909090916) [installing any sub-dependencies for the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=1&mode=live&start=188.48327272727275) [main install package. Take a look at what](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=1&mode=live&start=190.091) [you now should see under the node\_modules](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=1&mode=live&start=192.9266923076924) [folder. Although we asked npm to install a](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=1&mode=live&start=195.5611818181818) [single dependency, express, npm installed](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=1&mode=live&start=199.009909090909) [many other dependencies. What exactly are](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=1&mode=live&start=201.78785714285718) [these? These are the packages that express](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=1&mode=live&start=204.67136363636362) [itself depends on, and since we made our](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=1&mode=live&start=207.2925454545454) [project depend on express, these other](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=1&mode=live&start=210.58981818181823) [packages are now in the project's](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=1&mode=live&start=213.29044444444446) [sub-dependencies. Okay so let me quickly](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=1&mode=live&start=216.38177777777787)[review what happened when we invoked the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=1&mode=live&start=218.15908333333337) [command npm install express. Npm first](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=1&mode=live&start=219.926) [created a new node\_modules folder because](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=1&mode=live&start=223.2092) [that folder did not exist before. The](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=1&mode=live&start=226.30075) [first npm install will do that. Npm then](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=1&mode=live&start=229.38483333333332) [downloaded the express package from npmjs.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=1&mode=live&start=232.39149999999998) [com and placed it under the newly created](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=1&mode=live&start=235.0056363636364) [node\_modules folder. It then modified the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=1&mode=live&start=238.97) [package. json file to document this exact](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=1&mode=live&start=241.6106) [dependency and the version used for this](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=1&mode=live&start=244.45159999999998) [dependency, and it also created a](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=1&mode=live&start=246.973) [package-lock. json file. So let's talk](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=1&mode=live&start=250.79633333333334) [about these two files, package. json and package-lock. json.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=1&mode=live&start=255.20800000000003)

[The package.json and package-lock.json Files](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live)

[The package. json file is the one file](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live&start=1.161) [that you'll see in every npm package. It's](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live&start=3.775933333333333) [a JSON file that can be used to provide](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live&start=6.301230769230769) [information about a package and it's](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live&start=8.436307692307693) [required by npm. This file is mostly](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live&start=10.348500000000001) [modified by the npm command itself, but in](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live&start=13.149666666666672) [a few cases, you'll need to manually edit](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live&start=16.090153846153846)[this file as well. In the previous](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live&start=19.0766) [example, we started with a simple package.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live&start=22.086999999999996) [json file that only had the required](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live&start=24.541666666666654) [properties, name and version. The name of](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live&start=27.14855555555555) [an npm package is its unique identifier.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live&start=29.9369) [If you need to publish this package, that](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live&start=32.886) [name has to be unique, and not used](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live&start=35.25953846153849)[before, across the whole registry. The](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live&start=38.071999999999996) [version property is a semantic versioning](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live&start=40.691125) [string. We'll talk about this string in](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live&start=43.115875) [the next video. When we installed the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live&start=45.693999999999996) [express dependency, npm automatically](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live&start=48.40944444444445) [modified our package. json and added a](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live&start=50.03788888888891) [dependencies section documenting the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live&start=53.143799999999985)[version of express that it used. Here is](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live&start=54.943) [the package. json file for the popular](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live&start=58.67445454545455) [express package. As you can see, this file](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live&start=60.96154545454548) [includes meta information about express,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live&start=63.666999999999994) [things like description, license, and key](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live&start=65.377) [words, but the most important information](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live&start=67.46560000000001) [in this file is the dependencies section.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live&start=69.79888888888888) [These are the packages that express](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live&start=73.092) [depends on and this is the same list of](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live&start=74.93584615384613) [packages that we got when we installed](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live&start=77.83193333333334) [express locally in the previous test. This](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live&start=80.43920000000001) [is really the most important benefit of](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live&start=83.10425000000001) [the package. json file. This file makes](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live&start=86.11600000000001) [the building of the project dependencies a](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live&start=89.03999999999999) [reproducible task. This means by sharing](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live&start=91.84699999999997) [this package. json file with other](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live&start=93.71409090909088) [developers or with build servers, the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live&start=95.31172727272721) [process of building the project](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live&start=97.47749999999996) [dependencies on these other machines can](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live&start=99.377) [be automated through the dependencies](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live&start=101.5268) [section of the file here. Let me show you](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live&start=103.24538461538461) [how that works with a local example. Let](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live&start=105.81384615384614) [me add one more dependency in the 1-npm](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live&start=109.38008333333333) [folder example here. This time let's add](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live&start=111.86874999999996) [the lodash package. The command that we](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live&start=114.19923076923077) [need here is npm install lodash. Npm is](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live&start=116.6443846153846) [now downloading lodash and it just placed](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live&start=119.58100000000003) [it under the node\_modules folder and](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live&start=122.18772727272727) [updated the package. json file to document](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live&start=124.40009090909089) [this new dependency. Now, the 1-npm folder](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live&start=127.39872727272729)[right now has three things, the package.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live&start=130.95409090909095) [json file, the other package-lock. json](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live&start=133.80919999999998) [file, and the node\_modules folder. Now](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live&start=136.506) [usually when you share your project with](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live&start=139.657) [other developers, you don't share your](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live&start=141.904) [node\_modules folder. This is a big folder](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live&start=143.844) [with code written by others. It does not](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live&start=146.1155) [belong to your team's get repo, for](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live&start=148.8834666666666) [example. So what your team will get when](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live&start=151.32693333333322) [you share this project is just the JSON](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live&start=153.94968750000004) [file. So let me remove this node\_modules](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live&start=156.5481875000001) [folder to simulate that. So a team member](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live&start=159.47820000000002) [just pulled this code, they now have the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live&start=162.2612857142857) [package. json file, and to build their](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live&start=164.353857142857) [version of node\_modules, all they have to](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live&start=166.71325000000007) [do is run the npm install command without](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live&start=169.284) [any arguments, just like this. This](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live&start=172.2048000000001)[command will install all the dependencies](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live&start=174.24009090909095) [listed in package. json, along with their](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live&start=176.19772727272738) [sub-dependencies. In fact, thanks to the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live&start=180.5405714285714) [package-lock. json file, they will get the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live&start=182.8308333333333) [exact same versions even for the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live&start=185.1) [sub-dependencies tree. For example,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live&start=188.66100000000003) [express depends on this bytes package here](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live&start=190.4721818181818) [that was installed when we ran the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live&start=192.6568181818181) [npm-install command. Let's assume between](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live&start=195.70814285714286) [the time that you added the express](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live&start=197.50072727272726) [dependency and the time a team member](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live&start=199.41809090909086) [pulled your code to use it, a new version](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live&start=201.08480000000003) [of this bytes npm package was released.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live&start=203.174) [Your team member will not get that new](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live&start=205.6905) [version when they run npm install. They](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live&start=208.34499999999997) [are going to get the exact same version](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live&start=210.3386153846154) [that you used because of package-lock.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live&start=212.57553846153857)[json. So the version of bytes that was](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live&start=214.5545) [used here is 3. 0. 0. If you look at the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live&start=217.9965) [content of this package-lock. json file,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live&start=222.26209090909094) [you'll see information not only about this](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live&start=224.283) [project's direct dependencies, but rather](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live&start=226.77188888888887) [the whole dependency tree for the project.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live&start=228.5048) [Search for bytes, for example, you'll see](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live&start=230.889) [how the exact version of the bytes package](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live&start=233.2124166666667) [is included here, and you'll also](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live&start=235.84454545454545) [understand how bytes was added to the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live&start=237.78963636363633) [project because it's a dependency of](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live&start=240.1316363636364) [body-parser, which is a dependency of one](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live&start=242.164) [of your top-level dependencies expressed](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live&start=244.47260000000003) [in this case. While adding dependencies to](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live&start=246.87599999999998) [package. json when you install them, you](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live&start=250.29940000000005) [can also tell npm that a dependency is](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live&start=252.62675) [only a development dependency, which means](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live&start=255.61675) [it is not needed in a production](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live&start=257.935) [environment. To do that, you run the same](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live&start=260.728) [npm install command, but with a -D](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live&start=263.4975000000001) [argument, D for development. For example,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live&start=265.868) [let me install the nodemon package with a](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live&start=268.1616363636363) [-D argument here. You'll notice how npm](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live&start=271.53475000000003) [added this nodemon package under a new](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live&start=274.94550000000015) [section in package. json. This time it's](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live&start=278.10833333333323) [devDependencies. This is where you should](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live&start=280.90954545454537) [place things like your testing framework,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live&start=283.01063636363614) [your formatting tools, or anything else](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live&start=285.28060000000005) [that you use only while developing your](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live&start=287.635) [project. Now let's quickly take a look at](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live&start=291.2277499999998) [the help page for the npm install command,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live&start=293.6144999999999) [and you do that using npm help install. In](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live&start=295.96077777777776) [here, you'll see all the usage pattern and](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live&start=299.91114285714286) [the options that you can use with the npm](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live&start=301.2562857142858) [install command. And one of these options](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live&start=303.2422307692307) [that you can see right here is the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live&start=305.2463846153844) [--production flag, or you can use the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live&start=307.4786923076925) [NODE\_ENV environment variable and set that](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live&start=309.415) [to production, and what that will do is it](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live&start=312.0309999999999) [will completely ignore your](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live&start=314.8986363636364)[devDependencies because these are](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live&start=316.039) [development dependencies, so you don't](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live&start=318.0383333333334) [need them in production. This is handy](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live&start=319.85374999999993) [because this nodeman package is not](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live&start=321.7571666666664) [something that you need in production.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live&start=323.5370000000001) [It's only use is in development to](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live&start=325.391) [automatically restart Node whenever a file](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live&start=328.73350000000016) [is saved in the project. Nodemon is one](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live&start=330.8608461538462) [solution to the problem that you need to](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live&start=332.71376923076934) [manually restart Node when you make](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live&start=334.94500000000005) [changes to a file, and it's a good](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live&start=336.713) [compromise in development environments.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live&start=339.4823333333332) [But it's totally not needed in a](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live&start=340.867) [production environment. Before we move on](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live&start=343.53011111111107)[to the next topic, which is this semantic](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live&start=345.35223076923086) [versioning string that we've been seeing](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live&start=347.4746923076926) [in package. json, let me show you a](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live&start=349.39923076923066) [command you can use to automatically](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live&start=352.054) [create a package. json file for a brand](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live&start=353.81246153846143) [new project. So let me create another test](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live&start=356.1818181818182) [folder here, I can use the make directory](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live&start=358.7243636363639) [command here on this machine, and I'm](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live&start=361.1796363636363) [going to call this my-project, and cd into](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live&start=363.6647272727273) [it. So this is a completely empty](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live&start=367.5396363636364) [directory. Now instead of manually](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live&start=369.9330909090909) [creating a package. json file, you can run](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live&start=371.524) [the npm init command. This command will](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live&start=375.4939999999998) [ask you a few questions about your project](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live&start=378.33599999999996) [and use your answers to create an initial](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live&start=380.6213333333332) [package. json file for you. It tries to](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live&start=383.31733333333335) [use defaults from your folder, for](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live&start=385.90840000000003) [example, if your project is already a Git](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live&start=387.6472000000001) [repo, it'll figure that out and include](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live&start=390.4371666666667) [the repo URL. You can also run this](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live&start=393.08992307692307) [command with --yes to just use the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live&start=396.5576153846153)[defaults instead of interactively](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live&start=399.61680000000007) [answering questions. I'll do that for this](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live&start=401.37560000000013) [example. Check it out. It created a](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live&start=403.3866666666667) [package. json file with the name of this](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live&start=405.23625) [directory, an initial version, and this](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live&start=407.75425) [scripts section, which is an important one](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live&start=409.8690000000001) [that we're going to talk about in a few](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live&start=412.26423529411767) [videos, and it's a very good one. But](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live&start=414.3813529411767) [first, let's talk about these little](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live&start=416.38322222222223) [version strings, and understand the meanings of these elements.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=2&mode=live&start=418.5145555555555)

[Semantic Versioning (SemVer)](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=3&mode=live)

[Npm uses semantic versioning, or SemVer](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=3&mode=live&start=1.521) [for short, when it's time to update](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=3&mode=live&start=4.276714285714285) [packages. Every package has a version.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=3&mode=live&start=7.491714285714287) [This is one of the required information](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=3&mode=live&start=9.208083333333336) [about a package. That version in npm is](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=3&mode=live&start=10.968) [written with the SemVer format. The SemVer](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=3&mode=live&start=14.912615384615389) [string is basically a simple contract](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=3&mode=live&start=18.010727272727273) [between a package author and the user's of](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=3&mode=live&start=19.90890909090909) [that package. When that number gets bumped](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=3&mode=live&start=22.618833333333328) [up to release a new version of the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=3&mode=live&start=25.084)[package, the SemVer communicates how big](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=3&mode=live&start=27.646666666666672) [of a change to the package itself will](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=3&mode=live&start=29.73157142857143) [this new release be. The first number,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=3&mode=live&start=32.94585714285715) [which is called the major number, is used](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=3&mode=live&start=35.278) [to communicate that breaking changes](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=3&mode=live&start=37.211333333333336) [happened in the release. Those are changes](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=3&mode=live&start=39.6035) [that will require users to change their](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=3&mode=live&start=42.59425) [own code to make it work with the new](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=3&mode=live&start=44.55483333333336) [release. The second number, which is](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=3&mode=live&start=47.91881818181816) [called the minor number, is used to](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=3&mode=live&start=50.081)[communicate that new features were added](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=3&mode=live&start=52.04100000000001) [to this release, but nothing major. All](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=3&mode=live&start=54.11733333333333) [the changes are still backward compatible](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=3&mode=live&start=56.928250000000006) [and it's safe for your users to install](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=3&mode=live&start=58.95775000000002) [these minor releases and they will not](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=3&mode=live&start=61.555) [require the users to change their code to](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=3&mode=live&start=63.669) [make it work with these releases. The last](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=3&mode=live&start=66.68149999999997) [number, which is called the patch number,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=3&mode=live&start=69.75450000000001) [is used to communicate that the release](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=3&mode=live&start=72.08025000000002) [only contained bug fixes and security](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=3&mode=live&start=74.69900000000001) [fixes, no new features and no breaking](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=3&mode=live&start=77.132) [changes. You'll often see a few different](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=3&mode=live&start=81.24799999999996) [special characters before the version](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=3&mode=live&start=83.42436363636362) [strings in the package. json file. These](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=3&mode=live&start=84.748) [special characters represent a range of](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=3&mode=live&start=88.02120000000004) [acceptable versions and are put to use](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=3&mode=live&start=90.369) [when you instruct npm to update your](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=3&mode=live&start=92.57399999999998)[dependency tree. For example, the tilde](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=3&mode=live&start=95.40845454545456) [character means that an update can install](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=3&mode=live&start=98.2426363636364) [the most recent patch version. Remember,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=3&mode=live&start=101.85900000000001) [patch is the third number. For the version](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=3&mode=live&start=104.7605) [string on the screen here, it means npm](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=3&mode=live&start=107.01249999999995) [can install any version that starts with](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=3&mode=live&start=109.62199999999997) [1. 2 and is greater or equal to 1. 2. 3.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=3&mode=live&start=112.093) [So a 1. 2. 4 version would be okay and so](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=3&mode=live&start=116.91331578947364) [would 1. 2. 5 or anything in that class,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=3&mode=live&start=121.50684615384614) [however, a 1. 3. 0 version will not be](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=3&mode=live&start=124.77038461538457) [used. So basically this version range](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=3&mode=live&start=128.57071428571427) [string is equivalent to 1. 2. x where x is](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=3&mode=live&start=131.149) [greater or equal to 3. On the other hand,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=3&mode=live&start=135.80566666666664) [a caret symbol in front of a SemVer](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=3&mode=live&start=139.2832307692308) [string, is a more relaxed constraint. It](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=3&mode=live&start=141.58169230769246) [will get the package updated to the most](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=3&mode=live&start=143.97172727272724) [recent minor version. Remember, minor is](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=3&mode=live&start=146.96550000000002) [the middle number. For example, caret 1.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=3&mode=live&start=149.44850000000008) [2. 3 here will match any 1. x. y where x](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=3&mode=live&start=152.24223529411762) [is greater than or equal to 2 and y can be](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=3&mode=live&start=156.51088235294108) [anything. So you might get a 1. 3. 0 or a](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=3&mode=live&start=160.3069999999999) [1. 4. 5, for example, but npm will not](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=3&mode=live&start=164.23388888888888) [update all the way to 2. 0. I'll admit,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=3&mode=live&start=168.31488888888887) [this might be confusing at first, just](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=3&mode=live&start=172.04627272727274)[remember that tilde is for safe patch](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=3&mode=live&start=173.9967272727273) [level updates, whereas caret is for more](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=3&mode=live&start=176.96900000000002) [relaxed minor level update. Npm has a site](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=3&mode=live&start=180.35) [that may make understanding this a bit](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=3&mode=live&start=184.19233333333335) [easier, it's hosted here at semver. npmjs.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=3&mode=live&start=186.5029166666667) [com. You can pick a package to see all of](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=3&mode=live&start=189.01314285714292) [its available versions, then enter a range](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=3&mode=live&start=192.64883333333333) [string to test. For lodash, for example, a](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=3&mode=live&start=195.19975000000002) [tilde 4. 16. 3 matches all patch level](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=3&mode=live&start=198.2733846153846) [updates that start with 4. 16 and has the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=3&mode=live&start=201.442) [patch number greater than or equal to 3.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=3&mode=live&start=204.493) [While caret 4. 16. 3 will match what the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=3&mode=live&start=207.4554) [tilde version matched, but it will also](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=3&mode=live&start=211.06980000000001) [include all the 4. 17 versions. You might](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=3&mode=live&start=214.2334545454546) [find it easier to use the x notation, for](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=3&mode=live&start=217.68833333333336) [example, your version range string can](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=3&mode=live&start=220.48883333333347) [simply be 4. 16. x, or even 4. x. The](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=3&mode=live&start=223.5014285714286) [tilde and caret are helpful in](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=3&mode=live&start=228.70736363636365) [communicating the exact version a range](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=3&mode=live&start=230.76754545454554) [started with. I think SemVer is great and](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=3&mode=live&start=233.00016666666667) [responsible npm developers should respect](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=3&mode=live&start=236.4368333333334) [it when they release new versions of their](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=3&mode=live&start=238.40175) [code. But it's good to treat what it](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=3&mode=live&start=241.35041666666666) [communicates as a promise rather than a](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=3&mode=live&start=243.20192307692307)[guarantee because even a patch release](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=3&mode=live&start=244.99166666666667) [might leak, breaking changes through its](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=3&mode=live&start=248.10366666666664) [own dependencies. A minor version, for](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=3&mode=live&start=250.9776666666667) [example, might introduce new elements that](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=3&mode=live&start=253.1668) [conflicts with elements you previously](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=3&mode=live&start=255.073) [thought are okay to use. Testing your code](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=3&mode=live&start=257.64850000000007) [is the only way to provide some form of guarantee that it's not broken.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=3&mode=live&start=261.313923076923)

[Installing and Using NPM Packages](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=4&mode=live)

[You have two options when it comes to](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=4&mode=live&start=1.615) [installing an npm package. You can install](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=4&mode=live&start=4.151000000000001) [it either locally or globally. When we](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=4&mode=live&start=6.831249999999999) [worked under this 1-npm-command directory,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=4&mode=live&start=9.845) [all the three packages that we installed](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=4&mode=live&start=11.495000000000001) [under this folder here were local. This is](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=4&mode=live&start=13.987400000000001) [the default behavior of the npm install](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=4&mode=live&start=17.035200000000003) [command. It'll just install the package](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=4&mode=live&start=19.814900000000016) [locally under the project where you run](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=4&mode=live&start=22.02485714285714) [the command. If the package is to be used](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=4&mode=live&start=24.562857142857137)[within a Node folder, basically if you](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=4&mode=live&start=27.075999999999993) [need to use it just for one project, you](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=4&mode=live&start=28.864) [should probably install it locally. I'd](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=4&mode=live&start=32.50000000000001) [say 99% of the packages that you use](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=4&mode=live&start=34.89676923076923) [should be installed locally. The only](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=4&mode=live&start=37.91092307692305) [exception is when you need to install](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=4&mode=live&start=40.21327272727273) [global tools. For example,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=4&mode=live&start=42.99672727272729) [create-react-app is a package hosting a](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=4&mode=live&start=44.65822222222222) [tool. React developers use that tool to,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=4&mode=live&start=47.25688888888888) [well, create a fully configured react](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=4&mode=live&start=50.486000000000004) [application. This is an example of a](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=4&mode=live&start=53.28200000000001) [package that's usually installed globally.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=4&mode=live&start=56.00454545454547) [You don't need to be in a specific](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=4&mode=live&start=57.885) [directory to use this tool. You can use it](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=4&mode=live&start=60.052384615384604) [anywhere. Also, once your generated react](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=4&mode=live&start=62.65463636363636) [application is running, you are not really](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=4&mode=live&start=64.52609090909091) [depending on the create-react-app tool](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=4&mode=live&start=67.10720000000003) [itself anymore. You still depend on other](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=4&mode=live&start=68.99036363636364)[packages related to create-react-app, but](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=4&mode=live&start=71.58290909090908) [not on the package hosting the command. To](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=4&mode=live&start=73.788) [install and update packages globally, you](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=4&mode=live&start=78.03200000000001) [add the -g flag, which is short for](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=4&mode=live&start=80.52200000000005) [global. Once a tool package is installed](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=4&mode=live&start=83.82466666666669) [globally, its command will be available](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=4&mode=live&start=86.69933333333339) [for you to run from anywhere. So for](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=4&mode=live&start=89.05590909090913) [create-react-app, we npm install -g](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=4&mode=live&start=92.9895) [create-react-app. And once a tool package](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=4&mode=live&start=96.98575000000001) [is installed globally, its command will be](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=4&mode=live&start=99.50833333333334) [available for you to run from anywhere.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=4&mode=live&start=101.921) [The commands a package add to your system](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=4&mode=live&start=104.20109090909095) [are listed right here when you install](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=4&mode=live&start=106.85661538461538) [that package. So this create-react-app](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=4&mode=live&start=109.22369230769229) [command is now a command that I can run](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=4&mode=live&start=111.28642857142856) [from anywhere. Regardless of whether the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=4&mode=live&start=115.44571428571422) [package is installed globally or locally,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=4&mode=live&start=117.90280000000001) [once it's installed, you can require it](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=4&mode=live&start=120.202) [from any Node script. Under this 2-usage](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=4&mode=live&start=124.15636363636368) [folder here, we have a simple empty](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=4&mode=live&start=127.76253846153844) [package. json file. Let's install the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=4&mode=live&start=130.90446153846148) [lodash package locally. Remember how to do](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=4&mode=live&start=133.4032727272727) [that? Npm install lodash, and that's it,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=4&mode=live&start=136.091909090909) [that will install lodash locally under the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=4&mode=live&start=139.06363636363636) [2-usage folder, and place that package](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=4&mode=live&start=142.04299999999998) [under the node\_modules folder. Let's take](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=4&mode=live&start=144.51199999999992) [a look under the node\_modules folder,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=4&mode=live&start=147.42979999999997) [lodash is there. And note how this package](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=4&mode=live&start=150.572) [has no sub-dependencies at all. The only](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=4&mode=live&start=153.5000000000001) [package in our dependency tree right now](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=4&mode=live&start=156.21545454545455) [is lodash. Now within the current folder,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=4&mode=live&start=159.31454545454542) [we can require the lodash package from any](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=4&mode=live&start=161.9286363636363) [file. Here's a test that does exactly](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=4&mode=live&start=165.0552) [that. This test. js file requires the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=4&mode=live&start=168.7379000000001)[lodash library and then uses its sum](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=4&mode=live&start=171.77499999999998) [function to sum the integers in an array](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=4&mode=live&start=174.5993076923077) [and I'll output the result after that.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=4&mode=live&start=177.1057692307692) [Since lodash is already installed under](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=4&mode=live&start=179.4528) [the node\_modules folder, this file will](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=4&mode=live&start=181.64039999999997) [run fine and output the result. Now try to](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=4&mode=live&start=184.91409090909096) [run the same file after deleting the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=4&mode=live&start=189.651)[node\_modules folder. So rm -rf](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=4&mode=live&start=192.55833333333337) [node\_modules, all of it, and now you'll](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=4&mode=live&start=194.50414285714288) [find out that if you try to run Node test.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=4&mode=live&start=197.1061428571429) [js, you'll find out that you can't run](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=4&mode=live&start=200.87825) [this file. Lodash is no longer available](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=4&mode=live&start=203.92525000000003) [for Node to use. The node\_modules folder](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=4&mode=live&start=207.2175555555555) [is simply the connection between npm and](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=4&mode=live&start=210.53745454545455)[Node. You can actually place the lodash](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=4&mode=live&start=213.56018181818186) [dependency under the parent folder's](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=4&mode=live&start=216.42309090909097) [node\_modules folders. So the node\_modules](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=4&mode=live&start=218.449) [folder doesn't have to be in the exact](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=4&mode=live&start=220.15549999999996) [directory where you are, Node will check](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=4&mode=live&start=222.75969230769232) [all the parents for their own node\_modules](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=4&mode=live&start=224.85430769230774) [folder. So you can basically make a](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=4&mode=live&start=227.33418181818178) [directory in your home directory called](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=4&mode=live&start=230.103) [node\_modules, just like that, and that](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=4&mode=live&start=232.15499999999992) [directory would satisfy all the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=4&mode=live&start=234.51372727272727)[dependencies for all your projects, but](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=4&mode=live&start=236.99054545454544) [really this is not a recommended approach.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=4&mode=live&start=239.69733333333332) [If your Node script requires lodash, like](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=4&mode=live&start=242.236) [this, lodash should be a local dependency](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=4&mode=live&start=244.48299999999998) [under the project's main node\_modules](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=4&mode=live&start=247.19) [folder, and the version you install should](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=4&mode=live&start=249.94499999999994) [be documented in package. json so that all](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=4&mode=live&start=252.61018181818181) [members on the team have a similar](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=4&mode=live&start=257.372) [experience working the project dependencies.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=4&mode=live&start=264.372)

[Creating and Publishing an NPM Package](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live)

[I think we're ready to bring out the big](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=1.182) [guns. Well actually, this is a lot easier](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=3.6354000000000006) [than it sounds. Let's create and then](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=5.4445) [publish an npm package. Try to do this](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=8.316) [exercise with me on your own. Pause the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=11.381800000000002) [video as needed and mirror what I do. I've](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=13.580599999999999) [included a test file under the exercise](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=17.546833333333332)[files, right here under the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=19.561666666666653) [3-create-package directory. The goal is to](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=21.079636363636364) [make this file work and output what's](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=23.279454545454545) [expected, as you see here in the comment.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=25.98063636363636) [So if we execute this file right now, it](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=29.273) [will not work because the frame-print](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=31.742214285714272) [package does not exist. This is the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=33.492714285714285) [package that we will be creating. In this](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=36.1437142857143) [line, we're requiring this package and](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=39.110727272727274) [capturing the top level API of this](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=41.19490909090911) [package as the print variable. And then](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=44.2201111111111)[we're using the print variable as a](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=47.43172727272727) [function call. So the top level API in the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=49.99627272727273) [package that we need to create should be a](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=52.78741176470588) [function. And here is the expected output.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=55.43394117647058) [It just prints the message in the argument](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=57.09046153846153) [in a frame of stars. Alright, so let's](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=59.2372) [start from a make directory command. Now](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=63.694800000000015) [usually you need to name the package as](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=67.3265) [the string that we are using here to](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=69.63449999999999) [require it. So make directory frame-print.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=73.13633333333334) [So under frame-print, we need to create a](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=77.255) [new file, let's call this file index. js.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=79.85992307692311) [Now the name index. js is a bit special in](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=82.97112500000001) [Node and npm. By default, when you require](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=87.91487500000007) [a folder, Node will look for an index. js](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=91.14550000000003) [file under that folder, which will work in](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=94.291) [our case. So just to test this index. js,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=97.73020000000002) [let's place a console. log statement here](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=100.71476923076926) [and just say Testing. So let me actually](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=102.94178571428571) [split this file in the editor here. Okay,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=106.18807142857142) [so we've got this index. js file under the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=109.75274999999999) [frame-print directory, and we have the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=114.36) [index. js file that is under the test](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=116.40649999999998) [directory, which we're going to use to](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=119.4413076923077) [test the frame-print directory. Now to get](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=122.90038461538465) [this line here to work, this frame-print](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=125.81375000000001) [package should exist under the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=127.99950000000005) [node\_modules folder inside the test](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=130.30200000000002) [folder. We don't have that, we don't have](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=133.09866666666673) [a node\_modules folder inside that folder.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=135.3832307692308) [For testing purposes, instead of using](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=136.862) [this line, we can require the adjacent](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=139.23049999999992) [frame-print directory using relative](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=142.2945) [paths. So instead of requiring this](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=145.07650000000004) [directly from node\_modules, we can say](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=147.62427272727274)[let's go up one level and then require](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=149.847) [frame-print from the same level as the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=153.29438461538464) [parent of this test folder where we're](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=156.37260000000003) [testing. With that, we can run this index.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=159.6052000000001) [js file under the test folder and it will](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=161.943) [require the frame-print that we are](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=164.613) [testing right here. Alright, let's test](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=167.76900000000006) [that, so Node test/index. js, and you'll](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=170.67354545454543) [notice right away that we are in business.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=173.7688181818181) [The console. log line is now showing up in](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=176.9722307692308) [our test. Very good. We're still seeing a](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=180.41761538461535) [problem that says print is not a function,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=183.29392307692294) [because we did not export any API yet. So](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=185.81171428571432) [instead of console. log testing, let's go](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=188.58246153846156) [ahead and export an API. Now in a Node](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=191.1896923076924) [module, you can change the API using the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=194.43753846153842) [exports special objects, so I can do](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=197.20861538461529) [something like a is 42 in here. However,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=199.38315384615385) [if you need to change the top level](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=201.79507142857142) [export, you need to use the module.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=204.02764285714284) [exports = notation. So our top level](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=206.80445454545452)[export here, which we are capturing in the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=211.63954545454533) [print variable, is a function. So let's go](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=214.48609090909096) [ahead and do a function here. I'll name](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=216.80299999999997) [this function print. This function](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=219.7038) [receives a single argument, so we'll call](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=221.4758) [this argument msg. Now inside this](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=225.98814285714286) [function, let's console. log Testing from](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=230.6198)[function, and let me go ahead and run the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=234.70940000000002) [command again and make sure Testing from](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=237.4492857142858) [function appears. And it does. And you'll](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=239.39945454545455) [notice that the error about print not](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=242.2446363636364) [being a function is gone now, because our](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=244.9083076923077) [top level API is now a function. So now](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=247.79692307692306) [all we need to do is to make this function](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=250.79949999999994) [output the message with a star of frames.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=254.43019999999999) [For that, we can use a few console. log](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=258.387) [statements. So we can do stars and we'll](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=261.2588999999999) [do another one, just like that, and inside](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=264.8577692307692) [the frame we'll just console. log the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=268.6888) [message, just like that. Let's go ahead](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=272.2581000000001) [and test, Node test. The output now](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=275.72059999999993) [matches what was expected here. Okay, so](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=278.97187499999995) [this is a very simple package and really](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=281.6697333333334) [the logic here doesn't matter. What](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=283.90866666666693) [matters is, we now need to make this](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=285.6646923076923) [package work without our modification to](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=288.5182307692307) [the test here, basically by doing that.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=290.9625555555555) [And I'm going to assume that we're done](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=294.524) [developing this simple package. We need to](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=296.50200000000007) [publish this package and use it through](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=299.04881818181815) [npm. So what I want to do here, I'd like](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=302.6837272727272) [to go inside test and do something like](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=305.52274999999986) [npm install frame-print, and once this](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=307.8761) [command is done, I should be able to run](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=311.17070000000007) [my test and see the exact same output](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=315.15612499999986) [that's expected. So, to get this npm](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=318.2736249999997) [install command to install our own](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=320.94174999999996) [frame-print, we need to publish that](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=323.2082499999999) [package. Now since the package name is](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=325.5071538461539) [unique at npmjs. com, to avoid conflict as](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=328.1967692307694) [we're all doing this exercise, I'm going](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=331.73333333333335) [to add the prefix to this package here and](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=334.43728571428574) [use my own username at npmjs. com. This](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=336.4725714285715) [way, when we npm install the package you](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=339.24676923076925) [can use your own username and you can](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=342.6) [publish your own package as well. So you](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=345.696) [actually need to create an account at](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=348.71625) [npmjs. com if you don't have one. To](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=351.1601250000001) [publish any package at npm, you need to](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=353.9431818181818) [have credentials. So go ahead and do that.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=356.65663636363644) [So once you have an account, you can use](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=359.645) [your username and password to publish the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=362.21578571428586) [packages. So here's what you need to do in](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=365.03600000000006) [npm to accomplish that. I'm going clear](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=367.99133333333344) [this command. We'll come back to that in](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=369.63469230769226) [just a little bit, and now from anywhere](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=371.00453846153835) [here in your shell you need to do npm](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=373.367875) [login. Npm login is going to connect your](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=376.3991875000001) [npmjs. com credentials with your local npm](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=379.54300000000006) [tool here so that you can publish to your](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=382.2405) [account. So npm login will ask you for](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=385.35675)[username and password. Go ahead and put](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=388.5149) [these in and the email as well. This](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=391.6912727272727) [should match the email that you used when](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=395.36175000000003) [you created your account and now I am](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=397.1277500000001) [logged in to npmjs. Very good. Now we can](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=399.88909090909095) [publish the package. So this frame-print](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=403.93949999999995) [directory here is not yet a package](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=407.0024999999998) [because it does not have a package. json](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=409.6352307692308) [file. So we need to create a package. json](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=411.83769230769246) [file. Let me CD into it, frame-print, and](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=414.36785714285696) [to create a package. json we can simply](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=416.97069230769233) [use "npm init". The package name is no](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=420.61746153846155) [longer frame-print, so type in your npm](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=423.59874999999994) [username dash frame-print. The version can](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=425.858) [be 1. 0. 0, this is the first release. You](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=428.76079999999985) [can add descriptions, entry point test](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=433.5247) [command, git repository, and I'm going to](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=435.9828999999999) [keep everything default here. Okay, we](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=439.15049999999997) [have a package. json, and guess what? Once](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=441.9052222222222) [you have a package. json, all you have to](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=445.10985714285715) [do is npm publish, just like that. This](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=448.2405714285715) [will publish your npm package to npmjs.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=452.15833333333325) [com. So to test that the publish process](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=456.5794166666664) [was successful, you need to go to this](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=459.0720000000001) [URL: npmjs. com slash package slash the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=461.30561538461535) [name of the package that you used and you](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=463.91392307692286) [should see your package published. This](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=467.4018888888888) [means that npm can now install this](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=469.83866666666665) [package on any machine. So if you haven't](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=472.6783333333333) [done the first half of this exercise, you](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=475.24757142857135) [can just install this package from npm and](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=477.14071428571407) [just use it. Now that we have a package](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=480.3486666666666) [published, we can go back to the test](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=483.40971428571424) [directory here, so I no longer need this](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=485.668) [index. js file. So focus on this index. js](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=490.5130909090907) [file, under the test directory here, it is](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=494.1209999999999) [using the name of the package that I just](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=496.39949999999993)[published, but remember that this package](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=498.5932499999997) [is still in npmjs. com itself. We need to](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=500.5015454545454) [bring it here locally using npm install](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=503.54300000000006) [for this file to access it. So the command](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=505.97900000000016) [that we need in this case is just npm](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=508.78220000000005) [install the name of the package, and this](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=510.92780000000016) [will download the package and place it](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=513.0403076923077) [under the newly created node\_modules](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=514.9965384615384) [directory right here, as you can see. This](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=516.7741818181818) [is our package and it is exactly the code](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=519.6952307692308) [that we've written, but now this package](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=522.388307692308) [was downloaded from npm, and once we have](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=524.6453846153844) [the package downloaded from npm we can go](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=527.3641538461533) [ahead and test the script as is and this](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=530.1820000000002) [script will just work. So this is really](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=533.4455999999999) [how simple it is to publish and use an npm package.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=5&mode=live&start=536.5879999999996)

[NPX and the NPM Run Scripts](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live)

[Let's talk about npx and the npm run](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=1.546) [scripts. Npx is another binary that you](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=4.909555555555556) [get when you install Node, it's part of](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=7.067857142857141) [the npm toolset. And the npm scripts](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=9.385) [feature is useful and often underrated](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=12.211250000000003) [feature of npm. It enables you to automate](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=14.559583333333334) [the way your team uses your app. You can](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=17.19625) [use npm scripts to start, stop, restart,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=20.62792307692308) [or test you app in a standard way that](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=23.478) [encapsulates best practices. For this](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=27.713250000000006) [exercise, I prepared this 4-scripts](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=30.051153846153845) [directory here under the npm folder. In](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=32.36653846153846) [this folder you should see 4 files,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=35.46872727272728) [package. json and package-lock. json, this](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=37.734818181818206) [is so that you can install all the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=39.74563636363637) [dependencies of this exercise. A server.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=42.518) [js file which creates a simple express web](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=44.92290909090909) [server, and a test. js file, which tests](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=48.22738461538461) [the Math square root function. Now you](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=51.6950769230769) [don't really need to test the functions](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=54.134916666666655) [that are available to you in JavaScript](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=56.337) [like these. These functions are already](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=58.794) [tested, but this is just an exercise to](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=60.64966666666666) [see examples of how you can use npm](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=62.957) [scripts. Take a look at package. json,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=66.85477777777774)[you'll see a scripts section here with 3](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=70.08) [entries, start, test, and check. You can](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=73.65876923076924) [add more scripts in this section if you](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=76.60146153846158) [need to. These scripts are defined with](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=79.77715384615384) [other CLI tools like node, jest, and](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=82.39192307692305) [eslint, in these examples. To run these](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=85.68677777777775) [scripts, we first need to satisfy the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=88.74549999999998) [dependencies listed here in the files. We](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=91.12666666666661) [do that using the npm install command](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=93.21084615384612) [without any arguments, just like this.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=95.17623076923068) [This will create a node\_modules directory](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=97.04249999999998) [and place all the dependencies we have](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=99.02390909090909) [here under that. So let's test these](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=101.79527272727269) [scripts one a time. The start script is](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=104.18157142857143) [going to run this command: node server.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=106.57871428571428) [js. This is the same command that you can](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=108.9045384615385) [just run here to start server. js. In](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=111.97553333333333) [fact, go ahead and test that, it will say](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=114.44379999999997)[server is running. And the Npm start](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=117.11935714285714) [script is going to do the exact same](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=119.04285714285713) [action. So to run the npm start script,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=121.661) [you do npm run start, just like that. Now](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=124.699) [for some of the special scripts, start is](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=127.59957142857141) [an example, test is another example, they](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=130.1723333333333) [actually have shortcuts, so you don't need](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=132.36718181818182)[the run command, you can just do npm](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=134.27245454545456) [start. So go ahead and test that. This is](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=136.3294166666667) [equivalent to running node server. js](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=138.84584615384617) [command, and it will run the server for](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=141.18538461538466) [you. And you can go ahead and test the web](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=143.91979999999995) [server on port 800 and it should be](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=146.53579999999982) [running. Let's try the other script: npm](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=149.69199999999992)[run test is going to run the jest command.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=152.71099999999998) [Now if you try the jest command here, it](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=156.185) [will not work. It will say command not](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=159.5517500000001) [found, although jest was a dependency](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=162.47691666666663) [here, and the binary for jest exists](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=164.64041666666657) [somewhere under the node\_modules folder.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=167.44736363636363) [However, the jest CLI tool here is not a](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=169.486) [global one because we installed it locally](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=172.29815384615392) [under this folder. The cool thing with npm](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=174.78263636363639) [scripts is you don't need to worry about](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=178.075) [that, as long as jest is installed locally](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=180.671) [under the node\_modules, the npm scripts](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=183.56619999999998) [section is going to find it. So if you run](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=186.41079999999994) [npm test (another one of the special npm](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=190.0155333333333) [commands that has a shortcut for npm](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=192.61708333333334) [scripts), this will actually fire up jest.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=194.5566666666667) [It will find jest under the node\_modules,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=196.5250769230769) [and it will fire it up, and run the test.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=198.53192307692305) [test. js file, which is a special name](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=201.50880000000004) [that jest is going to find. Now if you](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=203.928) [need to run jest right here, outside of](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=208.0169999999999) [npm scripts, you have a few options, but](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=211.539) [the easiest option of all is to use the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=214.72299999999996) [npx command. So if you do npx jest, npx is](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=218.06747058823535) [short for npm execute, npx will also find](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=221.65158823529427) [the jest binary under the node\_modules](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=224.54925000000003) [folder and it will just use it. So npx](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=226.7195) [jest works as well. The eslint binary here](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=230.09714285714287) [in the check script is the same story. You](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=233.62571428571434) [can either use it with npm directly, or if](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=236.77199999999996) [you use it through the npm scripts, it'll](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=239.25959999999992) [work as well. Now the check script here is](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=242.40180000000004) [not a special npm script. So to run it you](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=245.7818181818181) [need to do npm run check. So this will run](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=249.05090909090907) [the command eslint server. js and it will](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=252.08657142857146) [check the server. js file for any eslint](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=254.61571428571438) [errors. Now usually when you do eslint you](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=257.20446153846154) [need an eslint configuration, but I think](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=259.6996923076923)[I have a global one here, so it'll just](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=261.18853846153837) [work. And it's working and checking that I](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=263.53657142857134) [have a console statement in server. js.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=266.105714285714) [Now eslint is really helpful, if this](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=268.77450000000005) [command does not work for you, what you](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=271.341875) [need to do is configure eslint. And to](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=273.50537500000013) [configure eslint, you need access to the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=275.8306666666667)[eslint command itself. Now we don't have](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=278.2900000000001) [it, again, this is installed locally under](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=280.5736666666666) [the node\_modules folder, so to configure](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=282.7255833333332) [eslint, we can use npx eslint. And what](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=285.8102727272728) [you need here is to initialize eslint with](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=289.66915384615385) [a configuration file. So you can use the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=291.77376923076935) [--init argument here, and this will ask](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=294.23099999999994) [you a few questions about how you like to](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=296.56619999999987) [configure eslint. For example, I am using](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=299.80949999999984) [a popular style guide, so I can use the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=301.7796666666666) [arrow functions here to pick "use a](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=303.98046666666653) [popular style guide", and I'm using](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=306.69469230769243) [airbnb. I like airbnb because it also](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=309.16438461538485) [supports React and I use React. So we'll](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=311.3480000000002) [go ahead and say No to React here, just](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=313.8231666666667) [airbnb. And the format can be anything, I](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=316.9874166666667) [like to have it in JavaScript. So what](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=319.1374615384617) [this command is going to do, it will](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=321.19023076923077) [install some other dependencies, as you](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=323.23515384615393) [can see here. Those dependencies will have](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=324.896) [the airbnb configuration, and it will also](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=326.982) [create an eslintrc file for your project](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=330.683090909091) [to work with eslint. So what's important](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=334.33833333333337) [to learn here is that we use npx to access](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=337.20600000000013) [the local binary eslint that's included in](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=341.27323076923096) [this project, and we were able to](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=344.03791666666666) [configure eslint through that. And if](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=346.36133333333316) [everything worked for you, if you run npm](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=348.4637692307693) [run check again, it should use your eslint](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=351.56284615384635) [and say that console. log statement is](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=354.60653846153855) [unexpected. It's a warning, you're not](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=357.2406923076925) [supposed to leave console log statements](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=359.56533333333323) [around. So the npm scripts section in here](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=361.9033333333331) [is really a good way for a team of](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=364.11693749999995) [developers to have a standard way of](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=366.462) [running things. This is how we run the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=368.68100000000004) [server, this is how we test the server,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=370.52785714285716) [this is how we check the server, and this](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=372.145) [is really just the basic usage, but there](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=374.43807142857156) [is more to the story. Certain names in the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=376.43092857142864) [npm run section are special. You can see](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=378.5877142857146) [the full list of these special commands](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=382.036) [using npm help npm-scripts, so let's take](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=384.073) [a look at that. So you'll see them here](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=386.79700000000014) [with prefixes like pre and post. So for](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=390.70345454545446) [example, you have pretest and posttest.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=393.8935) [These command will be run by the npm test](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=396.064) [command, before and after the command. So](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=399.2566000000001) [let's go ahead and test that, I'm going to](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=401.70115384615383) [do a posttest, and under this command I'll](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=404.5465384615384) [do something like, node -e to execute a](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=407.3476923076922) [script, and I'll just console. log in a](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=410.312) [string here, I'll console. log "Done](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=413.91815384615404) [Testing", just like that. So guess what?](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=416.75162500000005) [Now when we run the npm test script](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=420.809) [itself, it will automatically run the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=424.13146153846156) [posttest, npm test. And it will run the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=426.7026363636364) [jest command, and when it's done, it will](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=430.65972727272714) [execute the posttest script and output the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=433.92346153846154) [console. log message that we're done](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=436.577) [testing. So these pre and post versions of](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=438.9744285714287) [the npm run scripts give you an easy way](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=440.85006666666675) [for some flexibility around major npm](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=443.0497) [events like installing, publishing, and](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=446.12589999999994) [testing. And you can use them to customize](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=448.23890909090903) [what's happening around these events. They](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=450.5385454545452) [are very helpful when you need to](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=452.39475000000016) [integrate your project with external](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=454.591) [servers like a build or continuous](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=456.20850000000013)[integration server, or if you need to do](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=458.15318181818185) [custom actions before or after you release or deploy something new.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=6&mode=live&start=460.77063636363647)

[Updating NPM Packages](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=7&mode=live)

[In any Node project, it's usually a good](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=7&mode=live&start=0.349) [idea to update your npm dependencies](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=7&mode=live&start=2.9157692307692304) [before testing each release to get the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=7&mode=live&start=4.863636363636363) [updates that have been made to your](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=7&mode=live&start=7.2690909090909095) [dependencies. You want to at least get any](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=7&mode=live&start=9.578285714285716) [bug and security fixes in the patch number](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=7&mode=live&start=12.134857142857147) [of these dependencies. It's also much](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=7&mode=live&start=14.987333333333337) [easier to deal with these updates if you](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=7&mode=live&start=17.139500000000005) [do them frequently. The npm update is the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=7&mode=live&start=19.927500000000016) [command you can use to do that. It](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=7&mode=live&start=22.66008333333333) [respects all the semantic versioning](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=7&mode=live&start=25.436833333333333) [strings that are in package. json. For](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=7&mode=live&start=27.511000000000003) [this exercise, I have this 5-update](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=7&mode=live&start=30.40983333333333) [directory here under npm and it has a](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=7&mode=live&start=32.86883333333332)[package. json file with 2 exact](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=7&mode=live&start=36.385230769230766) [dependencies, lodash and request. If you](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=7&mode=live&start=39.3196923076923) [notice, these version strings for lodash](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=7&mode=live&start=41.94216666666667) [and request do not have an caret or tilde](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=7&mode=live&start=43.94066666666668) [prefixes. This makes them exact, they're](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=7&mode=live&start=47.98349999999999) [equivalent to doing equal sign here, which](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=7&mode=live&start=51.01927272727273) [means I am interested in exactly this](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=7&mode=live&start=53.29618181818181)[version. So the first step is to install](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=7&mode=live&start=56.04285714285715) [these dependencies. So we do that with npm](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=7&mode=live&start=59.58457142857146) [install. This will download the exact](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=7&mode=live&start=61.71892307692309) [versions that we're interested in and](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=7&mode=live&start=62.96784615384618) [place them under the node\_modules](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=7&mode=live&start=65.10827272727272) [directory. You can verify what versions](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=7&mode=live&start=67.04054545454542) [were installed using the npm ls command.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=7&mode=live&start=69.74408333333331)[Now the npm ls command is going to ls the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=7&mode=live&start=72.988) [whole dependency tree. So basically all](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=7&mode=live&start=76.45569230769226) [your top-level dependencies, and all of](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=7&mode=live&start=78.37620000000001) [their dependencies, and this request](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=7&mode=live&start=80.13660000000004) [package has some sub-dependencies. But if](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=7&mode=live&start=82.69) [you scroll up a little bit here, you](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=7&mode=live&start=85.38671428571429) [should see to top-level dependencies right](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=7&mode=live&start=87.13357142857144) [here at the beginning of the tree. And npm](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=7&mode=live&start=88.64233333333334) [installed the exact versions specified in](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=7&mode=live&start=91.61836363636364) [the package. json, which means, if I issue](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=7&mode=live&start=93.87545454545456) [the npm update command, nothing is going](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=7&mode=live&start=96.59864285714286) [to be updated because package. json asked](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=7&mode=live&start=98.83114285714286) [for exactly these versions. Now by](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=7&mode=live&start=102.23344444444443) [default, when you install any npm package,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=7&mode=live&start=105.17416666666665) [let's, for example, install the express](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=7&mode=live&start=107.72624999999995) [package, when npm installs that, it writes](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=7&mode=live&start=110.017) [it with the caret notation. So this was](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=7&mode=live&start=112.81) [added to package. json, but it was added](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=7&mode=live&start=115.36046153846152) [with the caret notation, which means that](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=7&mode=live&start=117.69441666666667) [any update in the minor section of the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=7&mode=live&start=119.72033333333334) [version is okay. We just got the latest](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=7&mode=live&start=122.58815384615384) [version of express, so npm update will](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=7&mode=live&start=126.00846153846153) [also not do anything. We don't have](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=7&mode=live&start=128.6872) [anything that can be updated. We have the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=7&mode=live&start=130.873125) [exact versions that we're interested in.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=7&mode=live&start=132.97299999999998) [Before playing with the version strings,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=7&mode=live&start=134.889) [let me remove this express dependency that](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=7&mode=live&start=136.74409090909097) [I just installed. You do that with npm](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=7&mode=live&start=139.44883333333334) [uninstall express. And this will remove it](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=7&mode=live&start=144.08416666666673) [from under the node\_modules directory and](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=7&mode=live&start=146.42883333333333) [it will also remove it from package. json,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=7&mode=live&start=147.85183333333333) [so we no longer depend on this express](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=7&mode=live&start=151.37156250000007) [package. To explore the update process,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=7&mode=live&start=155.12306250000015) [let's add a prefix here to the request](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=7&mode=live&start=157.50969230769226) [package, I'm going to add a caret to the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=7&mode=live&start=160.578) [request package, so this is the default](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=7&mode=live&start=162.28864285714286) [behavior when you install request, and for](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=7&mode=live&start=163.9394) [lodash, I am going to add a tilde. So the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=7&mode=live&start=166.3908) [caret in request means that any minor](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=7&mode=live&start=169.7254000000001) [update is okay. So anything in this](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=7&mode=live&start=172.04516666666666) [section will be updated, while the tilde](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=7&mode=live&start=174.35633333333325) [in lodash means only patch updates are](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=7&mode=live&start=177.23290909090912) [okay. You can see all the versions that](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=7&mode=live&start=180.86336363636374) [are available in an npm package using the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=7&mode=live&start=183.70115384615383) [command npm show, the name of the package,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=7&mode=live&start=186.38739999999999) [for example request, and this will show](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=7&mode=live&start=189.181) [everything about request, if you're](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=7&mode=live&start=191.99220000000003) [interested in just the versions you add](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=7&mode=live&start=193.75650000000002) [the word versions. So npm show request](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=7&mode=live&start=195.71475000000007) [versions. And this will give us an array](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=7&mode=live&start=197.73714285714289) [of all the versions available in request.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=7&mode=live&start=200.1034285714287) [Now the current version that we have is](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=7&mode=live&start=202.10318181818175) [here, and the latest version right now is](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=7&mode=live&start=204.7033076923077) [2. 87. 0. Because we used the caret in](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=7&mode=live&start=208.3445384615385) [request, the next update process is going](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=7&mode=live&start=212.20323076923077) [to take us from 2. 85. 0 to 2. 87. 0](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=7&mode=live&start=215.112) [because this is a minor update and that's](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=7&mode=live&start=218.4376666666667) [okay with the caret notation. What about](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=7&mode=live&start=221.032) [lodash? Let's check that out. So npm show](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=7&mode=live&start=224.37800000000007) [lodash versions, and the latest version](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=7&mode=live&start=228.2346666666666) [for lodash right now is 4. 17. 10 and what](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=7&mode=live&start=230.97972222222222) [I have here is 4. 16. 2 with tilde](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=7&mode=live&start=234.29694444444448) [notation, which means only patch updates](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=7&mode=live&start=237.37807692307692) [are going to be applied. So we're not](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=7&mode=live&start=239.65530769230767) [going to go all the way to 4. 17, but, we](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=7&mode=live&start=242.61784210526315) [can get 4. 16. 6 because that's a security](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=7&mode=live&start=246.5222631578947) [and bug level fix. So we'll go from 4. 16.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=7&mode=live&start=249.79950000000002) [2 to 4. 16. 6. Before running the npm](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=7&mode=live&start=253.15824999999992) [update command, anyway, I like to verify](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=7&mode=live&start=255.94262499999982) [what packages are going to be updated and](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=7&mode=live&start=257.80250000000007) [to what exact versions are they going to](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=7&mode=live&start=260.07683333333335) [be updated. And instead of doing this](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=7&mode=live&start=262.97216666666674) [manually in your head and checking the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=7&mode=live&start=264.9547500000001) [versions, there is an npm command, called](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=7&mode=live&start=266.717) [npm outdated. This will tell you what](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=7&mode=live&start=270.2714444444445) [packages will be updated. It will not](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=7&mode=live&start=272.8853333333332) [update the packages, but it will you that](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=7&mode=live&start=274.97419999999994) [if you run the npm update, these wanted](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=7&mode=live&start=277.13473333333314)[packages are what you're going to get. So](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=7&mode=live&start=279.4673636363637) [the current packages are what you have.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=7&mode=live&start=282.04375) [The wanted packages are what you're going](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=7&mode=live&start=284.737) [to get if you run the npm update command,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=7&mode=live&start=286.22649999999993) [and in here it will also show you the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=7&mode=live&start=288.3052307692308) [absolute latest packages if you're](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=7&mode=live&start=290.9567692307692) [interested in those. Because of semantic](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=7&mode=live&start=292.68933333333337) [versioning, in here, we're not really](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=7&mode=live&start=294.976) [getting the latest package, but the rather](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=7&mode=live&start=296.8180000000001) [the latest bug fix that we can have. And](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=7&mode=live&start=299.27463636363643) [again this is the absolute minimum thing](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=7&mode=live&start=302.80315384615386) [you should do when you're planning to](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=7&mode=live&start=304.568230769231) [update your packages. However, just be](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=7&mode=live&start=306.47754545454546) [careful and test because sometimes even](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=7&mode=live&start=308.42318181818183) [patch-level updates might introduce new](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=7&mode=live&start=310.7235) [bugs in your system. Alright, so to](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=7&mode=live&start=312.936) [update, we just run npm update and this](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=7&mode=live&start=315.8247857142858) [will update the packages according to](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=7&mode=live&start=318.8082142857145) [semantic versionings and once it's done,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=7&mode=live&start=321.2850000000001) [you can run npm ls (I'm going to pipe that](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=7&mode=live&start=324.001) [on less), and this will give you the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=7&mode=live&start=326.17433333333327) [latest dependency tree, starting from your](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=7&mode=live&start=328.28369999999995) [top-level dependencies here, that were](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=7&mode=live&start=330.3290999999998) [updated to the latest according to](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=7&mode=live&start=332.31233333333324)[semantic versioning. The package. json](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=7&mode=live&start=334.7758333333331) [file was also updated to reflect the new](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=7&mode=live&start=336.72274999999996) [versions that we're starting with right](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=7&mode=live&start=339.7247499999999) [now. And note how the npm update command](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=7&mode=live&start=341.64791666666656) [used the caret notation here, although I](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=7&mode=live&start=344.1793333333333) [was using the tilde notation before, so be](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=7&mode=live&start=346.72966666666656) [careful about that. Now what if I'm](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=7&mode=live&start=350.0949999999999) [interested in an update that is beyond the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=7&mode=live&start=353.5974285714287) [version string? I can do that with npm](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=7&mode=live&start=357.740285714286) [install, the name of the package, and I](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=7&mode=live&start=360.4124000000001) [can actually place any version here. So I](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=7&mode=live&start=362.5942666666669) [can say 4. 17, or just 4, and that will](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=7&mode=live&start=365.3744999999999) [give me the latest on the 4. Or I can just](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=7&mode=live&start=368.719) [say, latest, npm install lodash at latest,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=7&mode=live&start=371.99428571428575) [and this will give me the absolute latest](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=7&mode=live&start=374.3082857142858) [lodash library, as you can see here, 4.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=7&mode=live&start=377.0333333333334) [17. 10, and this matches the latest](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=7&mode=live&start=379.9144615384615) [version for lodash, right here, with npm](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=7&mode=live&start=383.09569230769233) [show lodash version, the singular version](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=7&mode=live&start=385.9676666666666) [here is going to give me the latest](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=7&mode=live&start=387.7666666666665) [version available for lodash, and it's the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=7&mode=live&start=390.0680000000001)[current version that I have in package.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=7&mode=live&start=391.99650000000025) [json, and this happened because I](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=7&mode=live&start=394.07700000000006) [specified that I am interested in the latest version of lodash.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=7&mode=live&start=395.882)

[Wrap Up](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=8&mode=live)

[It's a wrap on this npm course module, we](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=8&mode=live&start=0.849) [covered a lot of topics under npm, but](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=8&mode=live&start=3.4647857142857146) [they were really all important and will be](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=8&mode=live&start=5.93846153846154) [needed when working with Node projects.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=8&mode=live&start=8.65969230769231) [I'd like to remind you thought that npm is](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=8&mode=live&start=10.85466666666667) [just one package manager that you can use,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=8&mode=live&start=14.175357142857143) [there are a few others, most notably the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=8&mode=live&start=16.506214285714286) [yarn project by Facebook. The commands for](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=8&mode=live&start=19.29885714285714) [these other package managers might be](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=8&mode=live&start=21.922399999999996) [slightly different, but the concepts are](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=8&mode=live&start=23.60719999999999) [similar. Npm is what you get by default](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=8&mode=live&start=25.842166666666667) [when you install Node, but you can easily](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=8&mode=live&start=28.82275) [switch to other managers if you like them](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=8&mode=live&start=30.780749999999998)[better. So in this module, we talked about](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=8&mode=live&start=33.16884615384615) [what is npm and why is it needed. We](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=8&mode=live&start=35.815) [explored the basic commands for working](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=8&mode=live&start=39.015785714285684) [with npm. We discussed the purpose of](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=8&mode=live&start=41.12445454545454) [package. json and package-lock. json. We](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=8&mode=live&start=43.437636363636344) [learned about semantic versioning and how](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=8&mode=live&start=45.689299999999996) [the npm commands work with them. We](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=8&mode=live&start=48.20989999999998) [learned how to locally and globally](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=8&mode=live&start=50.9455) [install npm packages, and how to use these](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=8&mode=live&start=53.261) [installed packages in Node. We created a](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=8&mode=live&start=56.575000000000024)[simple npm package and published that on](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=8&mode=live&start=59.525749999999995) [npmjs. com. We learned about using npx to](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=8&mode=live&start=62.544499999999985) [execute locally installed executable npm](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=8&mode=live&start=66.27749999999997)[commands. And we saw how to use npm](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=8&mode=live&start=68.66958333333328) [run-scripts to have a standard way to run](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=8&mode=live&start=71.19853333333336) [and test the tasks in a project. And](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=8&mode=live&start=73.542) [finally, we learned how to check and](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=8&mode=live&start=76.1694285714286) [update your project dependency tree. In](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=8&mode=live&start=78.60416666666667) [the next module, we'll talk about the most](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=8&mode=live&start=81.32333333333332) [important aspect about Node. js, which is](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=8&mode=live&start=84.51000000000005) [how it works with slow operations without blocking other operations.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=3bc78f2b-919d-4a94-aafd-2d124821758a&clip=8&mode=live&start=89.41928571428572)

[Modules and Concurrency](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=0&mode=live)

[Introduction](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=0&mode=live)

[In this module, we're going to talk about](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=0&mode=live&start=0) [two of the core fundamentals of Node. Its](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=0&mode=live&start=3.117866666666667) [modules system, and how to define and](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=0&mode=live&start=6.1665833333333335) [require modules using the exports and](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=0&mode=live&start=8.410666666666668) [require objects. And we'll also talk about](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=0&mode=live&start=10.391363636363637) [how Node handles slow operations and allow](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=0&mode=live&start=12.83563636363637) [the execution of many things at once](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=0&mode=live&start=15.571083333333332) [without using any threads, which is a big](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=0&mode=live&start=18.423) [deal. Let's start with the simple module](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=0&mode=live&start=21.689666666666678) [system and talk about the three important](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=0&mode=live&start=23.5235) [keywords here, the module keyword, the exports keyword, and the require keyword.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=0&mode=live&start=25.455333333333336)

[Defining and Using Node Modules](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live)

[Let's explore how to define and use](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=0.985) [modules in Node, but before we do that,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=2.9300000000000006) [let me start with a basic question. What](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=5.207125) [exactly is a module? In Node, the word](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=8.0092) [module is basically a fancy word that](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=11.283428571428573) [means a file, or a folder, that contains](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=13.672928571428576) [code. That's it. So this file here with](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=16.5645) [this simple console. log line is a module.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=20.048846153846153) [I am currently under the 4-modules folder](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=23.831) [under the 1-define-use folder. And the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=27.301727272727284) [first file right there is a module.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=29.855) [However, the reason the word module is a](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=31.85) [bit better to use than using just the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=34.552857142857164) [terms file or folder here is because Node](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=37.320461538461544) [actually does not just execute the file as](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=40.282307692307725) [is, it wraps the file with a function](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=43.075500000000005) [first. This is something that you need to](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=45.76750000000001) [remember, so let me show you what I mean.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=48.36412500000002) [You know the keyword arguments in](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=51.27) [JavaScript? If you access that keyword](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=53.8337142857143) [inside a function, like what I am doing in](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=55.51814285714285) [this file here, the keyword arguments will](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=57.781) [represent all the arguments passed into](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=60.95390909090908) [this function, regardless of how many of](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=63.473571428571425) [them get passed to it. So if I execute](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=65.94657142857145) [this file, 2-arguments, under this folder,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=69.5606) [you'll notice how, right here, this is the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=72.332) [representation of the arguments keyword,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=74.43163636363636)[and it's representing all the arguments](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=75.9736) [that we passed here to the dynamic](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=78.23740000000004) [arguments function. So this arguments](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=81.68842857142856) [keyword here is a handy way to write](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=83.62984615384613) [functions that accept a dynamic number of](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=85.93076923076916) [arguments. Okay, here's a weird question](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=88.84054545454542) [now, and this is one of the questions I'd](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=91.642) [ask in a Node interview. What would Node](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=94.07007142857145) [do if you console. log the keyword](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=96.38684615384616) [arguments on the top-level of a Node file](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=98.64515384615389) [like this? If your answer is, arguments is](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=101.533) [not defined here because we are not inside](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=104.60350000000001) [a function, you would not be getting that](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=107.66950000000004) [Node job. Your answer is correct in a](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=110.21157142857146) [browser, but Node has a different story.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=112.579) [Because Node internally wraps every file](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=116.15319999999997) [it executes with a function, this console.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=119.11825) [log line here will actually output](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=122.4625) [something. Let's try it. Node 3-wrapper.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=125.012) [js. It outputs exactly five arguments,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=128.151) [which Node passed to that hidden wrapper](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=132.786) [function when it executes your file. You](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=136.17723076923082) [should remember that every time you hear](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=139.45545454545456) [the word module. This is not just a file,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=142.05563636363644) [it's a function that receives arguments](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=145.48553846153854) [and it will also return something. Let me](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=147.8010769230771) [write in comments here what Node does](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=151.099)[internally to this file. There is a](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=153.922) [function wrapper here, so basically there](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=156.52249999999998) [the function call, and this function](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=158.65000000000003) [receives a set of arguments, and your code](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=160.6760000000001) [becomes the body of this function. And](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=164.22900000000004) [then Node will call this function. The](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=167.60363636363635) [arguments that this wrapping function](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=169.89009090909093)[receives are, in order, exports, module,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=172.33777777777777) [require, \_\_filename, and then \_\_dirname.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=176.74111111111108) [Have you used any of these arguments](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=179.9037272727273) [before in your Node file? You can use the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=184.154) [exports or module. exports to define the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=187.70346153846148) [API of a module, you can use require to](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=190.38907142857147) [require other modules inside this one, and](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=193.71328571428586) [the \_\_filename has the path of this file,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=196.47392307692314) [and the \_\_dirname has the path to the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=199.709) [folder hosting this file. All of these](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=202.96033333333338) [objects, which you can use inside this](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=205.7881818181818) [file, are not global objects. They are](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=208.59327272727268) [just arguments to the wrapping function.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=211.88800000000006) [They are customized for each file, and](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=214.782) [they're different in each file. So when](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=217.47233333333332) [inside a file I do something like exports.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=220.3075) [a = 42, I am just using one of the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=223.9615) [arguments of the wrapping function. The](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=228.18600000000004) [keyword exports here is not some globally](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=230.4725) [available keyword. It's just the first](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=233.493) [argument to the hidden wrapping function.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=236.03359999999998) [This wrapping function is also the reason](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=238.55) [why, in Node, when we define a variable in](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=241.2546923076924) [any file on the top-level like, for](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=244.86820000000003) [example, let g = 1. This g variable will](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=247.89033333333342) [not be a global variable at all. It's just](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=251.5566363636364) [a variable inside a function. The scope of](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=254.9293076923077) [this variable is the hidden wrapping](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=257.86653846153837) [function. This is different than what a](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=260.26099999999997) [browser would do when you define a](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=263.27799999999985) [variable top-level like this. Browsers do](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=266.05800000000005) [not have this hidden wrapping function. So](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=268.4755) [when you define a variable like this in a](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=271.27149999999995) [browser in a script, that variable will be](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=273.4449999999997) [global. It will be available to all the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=275.6217692307693) [scripts you include after defining it](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=278.0433076923079) [because you're basically putting it on the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=280.0773636363636) [global scope. But that's the browser, not](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=282.58311111111107) [Node. Node has the wrapping function. And](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=285.5798888888887) [this g here is not global at all. It's](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=288.5172857142856) [just a local variable inside the wrapping](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=292.39088888888887) [function. It is really important that you](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=296.08611111111094) [remember that. This variable here is just](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=298.357) [scoped to the built-in wrapping function.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=301.4325454545454) [All right, so besides making five](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=304.426) [arguments available to you inside any](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=307.22418181818165) [file, the wrapping function also](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=310.20866666666666) [internally return something. And the thing](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=313.47200000000004) [it returns here is the module. exports](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=317.06909090909096)[property. This is what the built-in](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=320.8936363636365) [wrapping function return by default, all](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=323.4104999999999) [the time, for every file, it will return](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=325.7252727272727) [module. exports. And "module" here is just](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=328.47945454545436) [the module argument that gets passed to](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=330.57915384615376) [the function as well, and it's the object](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=332.554769230769) [that Node uses to manage the dependencies](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=334.8729230769229) [and to manage the APIs of modules. Note](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=337.072875) [that you don't need to use the return](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=340.54475) [keyword here yourself, Node will always](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=342.84675000000016) [make this function return the module.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=344.9465454545454) [exports object, and this is the object we](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=347.41963636363624) [can use to define the API of this module.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=350.27319999999986) [The exports object here is just an alias](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=353.317) [for module. exports. When Node invokes the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=357.27190909090905) [wrapping function, it simply passes](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=360.74344444444444) [module. exports here as the value of the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=363.229) [first argument here. This is why we can](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=366.9002727272729) [use the exports keyword itself to export a](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=369.7216428571429) [new property on the API, but what we're](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=372.0330714285716) [really modifying when we do that is the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=374.3385384615384) [module. exports object, which is the one](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=376.97463636363636) [being returned. So just like I did](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=380.1513636363636) [exports. a = 42 here, I can do module.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=383.24366666666674) [exports, and let's export another property](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=387.1760666666668) [for this module's API, let's do b = 37. So](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=389.2785555555556) [both a and b are part of the API of this](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=393.2363333333333)[module because exports is just an alias to](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=398.0494444444443) [module. exports, and we're returning](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=401.25822222222206) [module. exports. To use this API that we](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=403.3805) [just defined in these 2 lines here, there](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=406.92849999999976) [is another file here in the same folder,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=409.0115000000001) [4-require, and this is invoking the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=411.2131111111111) [require function, and passing in as a](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=414.58577777777776) [string, the path of the module. The result](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=417.7540909090908) [of this require call, is really the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=420.92966666666666) [module. exports object that Node returned](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=423.459) [from our module. So the module's API here](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=425.7475) [becomes the module. exports that the file](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=428.9595) [returned, and we can see the console. log](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=431.14699999999993) [in here. Let's go ahead and test that real](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=433.42600000000004) [quick, node 4-require, and as you can see](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=435.6445000000003) [here, we're getting the properties of the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=438.3456666666666) [module that we defined here on lines 7 and](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=440.73566666666665) [8. This alias relation between exports and](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=443.6006666666666) [module. exports is the reason why if we](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=446.59227272727287) [re-assign the exports object directly, if](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=450.13769230769236) [we do exports = something, we're not](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=452.7730769230771) [really changing the module. exports object](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=455.6546666666667) [anymore, we're just re-assigning the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=457.904) [alias, we're making this variable point to](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=460.0835) [a new local object in here and no longer](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=463.16193333333337) [point to module. exports. So if, for](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=467.2071333333336) [example, you want your top-level API to be](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=470.2262307692308) [a function instead of an object, which is](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=473.48284615384637) [a valid case that we use all the time. We](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=475.68899999999985) [want our top-level API to be a function,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=478.05046153846155) [not just an object. You can't do it this](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=480.23815384615403) [way, this is not okay. This will not work,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=482.76300000000003) [again, because you're not really modifying](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=485.676) [module. exports, you're just breaking the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=487.899)[assignment reference between exports and](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=490.3836666666665) [module. exports, but you can totally do](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=492.54933333333327) [module. exports = a function, and that](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=495.7809999999998) [would be okay, because module. exports is](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=498.7773333333333) [what being returned, and I can change the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=501.5971666666665) [value of module. exports itself. So this](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=504.6308333333333) [line here is okay. And as you can see, the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=507.0688) [top-level API does not have to be an](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=509.8628000000001) [object. In the next module, I'll go over a](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=512.0086666666666) [few examples of modules in Node and show](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=514.3624666666665) [you how you can require them and use their API.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=1&mode=live&start=516.5215)

[Examples of Module APIs](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=2&mode=live)

[Here are some examples that define and use](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=2&mode=live&start=1.47) [multiple types of API objects. I am now](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=2&mode=live&start=4.600461538461539) [under the 2-examples folder under the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=2&mode=live&start=8.052909090909091) [4-modules folder, and in here we have 8](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=2&mode=live&start=11.04472727272727) [files, 4 different API exports and how to](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=2&mode=live&start=14.242499999999998) [use them. The first file here is the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=2&mode=live&start=17.176499999999997) [simple case. When you want your API to be](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=2&mode=live&start=19.45520000000001) [a simple object, you don't really need to](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=2&mode=live&start=21.773) [use module. exports, you can just use](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=2&mode=live&start=24.23045454545454) [exports, so you put exports and then you](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=2&mode=live&start=26.191692307692307) [put properties on your API. And to use](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=2&mode=live&start=28.27107692307692) [this module, when you call the require](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=2&mode=live&start=31.81346153846153) [function on this module, you get back a](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=2&mode=live&start=35.07216666666667) [simple API object so you can read the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=2&mode=live&start=38.63349999999999) [elements of the API as properties on that](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=2&mode=live&start=41.705071428571436) [object, Node 1-use. js. We are getting the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=2&mode=live&start=44.48278571428573) [values that are exported through the API](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=2&mode=live&start=48.50499999999999) [here because the API is just an object.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=2&mode=live&start=51.8914) [The second example here, the top-level API](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=2&mode=live&start=54.937) [is an array so I needed to use module.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=2&mode=live&start=58.342499999999994) [experts because I am reassigning the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=2&mode=live&start=62.7254) [default export, which is usually an empty](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=2&mode=live&start=65.65759999999999) [object, and now I'm saying my top level](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=2&mode=live&start=67.9610714285714) [API is an array. To use this kind of API,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=2&mode=live&start=70.08278571428563) [under 2-use here. js, when you require the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=2&mode=live&start=74.2415384615385) [module, you get back the value that you](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=2&mode=live&start=77.61261538461538) [need. That value itself becomes your API,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=2&mode=live&start=80.89384615384616)[and note how you can just inline the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=2&mode=live&start=83.59415384615383) [require call inside some other function](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=2&mode=live&start=86.568) [because it's just a function call that](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=2&mode=live&start=88.37999999999995) [returns a value. That value is your API](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=2&mode=live&start=90.66846153846154) [and in this case it's an array. So node](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=2&mode=live&start=93.54969230769234) [2-use. js and you get the array directly](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=2&mode=live&start=97.14750000000002) [here from the console log line. Your API](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=2&mode=live&start=100.50420000000001) [can also be just a string. Look at this](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=2&mode=live&start=104.33780000000006) [file. This API is returning a template](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=2&mode=live&start=108.48145454545455) [string. Note that these characters are the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=2&mode=live&start=111.44118181818186) [back deck characters, not the single quote](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=2&mode=live&start=113.61066666666665) [characters, right? Because this is a](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=2&mode=live&start=115.52254545454544) [multi-line template string and the whole](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=2&mode=live&start=117.0803636363636) [API is just returning this string. So if I](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=2&mode=live&start=119.51818181818182) [want to use this API when I require the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=2&mode=live&start=123.02882352941178) [file, I get back an object which is a](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=2&mode=live&start=125.71929411764711) [string, so if I console. log this object,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=2&mode=live&start=128.25470588235294) [it will be a string. So node 3-use. js.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=2&mode=live&start=130.33611764705893)[That is the string that this API is using.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=2&mode=live&start=133.64684615384618) [But let's say you do want an HTML](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=2&mode=live&start=138.169) [template, but you want it to be dynamic.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=2&mode=live&start=140.40099999999998) [You want to tell your module that you'd](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=2&mode=live&start=142.633) [like it to generate an HTML template for a](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=2&mode=live&start=144.6392857142857) [certain title, for example, instead of a](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=2&mode=live&start=147.12949999999998) [generic title. How do you do that? You do](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=2&mode=live&start=149.42899999999992) [it by exporting a function. Check this one](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=2&mode=live&start=152.3936666666667) [out, 4-function here. It's the exact same](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=2&mode=live&start=155.17081818181816) [template text and it's being done through](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=2&mode=live&start=157.8047272727272) [a template string as well, but the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=2&mode=live&start=159.83372727272732) [difference is that the top level API here](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=2&mode=live&start=161.9527142857143) [is now a function and I used the shorthand](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=2&mode=live&start=164.9195714285715) [notation for the arrow function here to](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=2&mode=live&start=168.33684615384615) [have an arrow function that receives the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=2&mode=live&start=171.04423076923078) [title as a single argument and then return](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=2&mode=live&start=173.049) [a template string that injects the title](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=2&mode=live&start=175.42566666666667) [value right here inside the title tag. To](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=2&mode=live&start=178.08100000000002) [use this API that is basically a function,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=2&mode=live&start=181.21746153846152) [when you require this function here, in](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=2&mode=live&start=184.415) [4-use, right, you get back a function. I](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=2&mode=live&start=187.61499999999998) [called it here templateGenerator, it's a](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=2&mode=live&start=191.2509090909091) [function, and you can invoke this function](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=2&mode=live&start=193.86636363636364) [with any argument that you want because](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=2&mode=live&start=196.75163636363638) [the top-level API is itself a function. I](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=2&mode=live&start=199.41545454545457) [captured the result of the require call](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=2&mode=live&start=202.89116666666675) [into a variable and I am now executing](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=2&mode=live&start=205.77733333333336) [that variable because it's just a function](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=2&mode=live&start=208.47866666666678) [and the result of executing this function](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=2&mode=live&start=211.32191666666665) [is what the function returned here, which](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=2&mode=live&start=214.357) [is the template. So this becomes my](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=2&mode=live&start=216.50039999999993)[template and I can console. log that. So](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=2&mode=live&start=218.68409090909088) [node 4-use. js and you get the exact same](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=2&mode=live&start=221.263) [template, but now it is being customized](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=2&mode=live&start=224.5480000000001) [with a custom title that I get to pass to](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=2&mode=live&start=227.1794615384615) [the function that this API is exporting.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=2&mode=live&start=231.2117692307691) [So this API is now a lot more flexible](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=2&mode=live&start=233.14928571428567) [than the previous one, which just](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=2&mode=live&start=235.59066666666666)[hard-coded a value for me. So these are](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=2&mode=live&start=237.9646666666667) [just a few examples of how flexible this](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=2&mode=live&start=240.87992307692306) [module. exports object is and how you can](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=2&mode=live&start=243.37838461538453) [use it to return any kind of API in a node module.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=2&mode=live&start=250.003)

[Node's Global Object](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=3&mode=live)

[If defining a variable on the top-level](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=3&mode=live&start=1.417) [scope in a node module does not make a](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=3&mode=live&start=3.8034615384615384) [global one, is there a way to define a](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=3&mode=live&start=6.874625) [global value in Node? The answer is yes,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=3&mode=live&start=9.9515) [but you should really avoid doing that.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=3&mode=live&start=12.756454545454543) [The only global variables in Node are the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=3&mode=live&start=15.272) [variables attached to this special global](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=3&mode=live&start=18.666000000000004) [object. This global object is the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=3&mode=live&start=21.159363636363636) [equivalent to the window object in](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=3&mode=live&start=23.548454545454547) [browsers, and it's the only global concept](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=3&mode=live&start=25.88025) [in Node. If you inspect this global](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=3&mode=live&start=28.533833333333337) [object, I'm using a. dir trick here to](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=3&mode=live&start=30.97521428571428) [only show the top-level properties on this](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=3&mode=live&start=33.668357142857126) [object rather than inspecting it as a](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=3&mode=live&start=36.39027272727271) [tree, because it's a big one, if you](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=3&mode=live&start=38.99507692307692) [execute this file, node 1-dir. js, you'll](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=3&mode=live&start=41.46338461538461) [see a few things here on the global](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=3&mode=live&start=44.19576923076922) [object. There is the process object, for](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=3&mode=live&start=47.80930769230766) [example, and there are other features like](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=3&mode=live&start=49.535000000000004) [buffers and timers. All of these here are](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=3&mode=live&start=51.20483333333333) [globally available in all Node modules](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=3&mode=live&start=54.37150000000002) [because they're attached of this special](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=3&mode=live&start=57.05654545454545) [global object. So when you use a](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=3&mode=live&start=60.051636363636355) [setTimeout call, setTimeout, you're](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=3&mode=live&start=64.31227272727273) [actually using global. setTimeout, but](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=3&mode=live&start=66.92209090909091) [because it's part of the global object, we](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=3&mode=live&start=69.4378) [can use it directly. We don't need to do](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=3&mode=live&start=72.56015384615385) [global. because that's the concept of the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=3&mode=live&start=75.23453846153848) [global object in Node. Things will just be](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=3&mode=live&start=77.4315) [available globally. You can also attach](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=3&mode=live&start=80.78766666666664) [new things to this global object yourself.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=3&mode=live&start=83.3100909090909) [In the 2-set. js file here I have a simple](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=3&mode=live&start=85.93) [example. I am doing global. answer = 42,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=3&mode=live&start=89.18999999999994) [making answer a new global value now that](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=3&mode=live&start=92.90900000000003) [you can access in ANY node module. Here's](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=3&mode=live&start=96.6825) [how you can test that, in the 2-test. js](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=3&mode=live&start=99.72649999999999) [file here, I am requiring the file that](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=3&mode=live&start=102.94757142857144) [added the global value, and then console](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=3&mode=live&start=105.5847142857143) [logging answer directly. Not as part of an](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=3&mode=live&start=108.37650000000002) [API. And guess what? If we execute 2-test](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=3&mode=live&start=111.64278571428574) [here, because answer was set on the global](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=3&mode=live&start=114.8216428571429) [object, you can access it from anywhere](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=3&mode=live&start=117.91586666666666) [directly. Pretty Cool right? WRONG. Don't](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=3&mode=live&start=120.61273333333332) [do that. Global values like this are bad.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=3&mode=live&start=123.95514285714283) [This is true here and it's also true in](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=3&mode=live&start=127.21314285714286) [the browser environment. You should not](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=3&mode=live&start=130.3295) [make your code depend on any global state.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=3&mode=live&start=132.42650000000003) [Just treat this global object as a](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=3&mode=live&start=135.36100000000002) [built-in thing that Node itself uses, and](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=3&mode=live&start=138.1306666666667) [you shouldn't. Do not attach anything to it.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=3&mode=live&start=143.922)

[The Event Loop](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=4&mode=live)

[Let's work under folder 4-event-loop. The](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=4&mode=live&start=0.621) [first file here, 1-log. js has a single](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=4&mode=live&start=3.8343333333333343) [console. log line. Execute this simple](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=4&mode=live&start=8.106000000000002) [file. Node 1-log. js line. What I want you](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=4&mode=live&start=11.303999999999998) [to notice now is that Node has started an](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=4&mode=live&start=14.6722) [operating system process here and it's now](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=4&mode=live&start=17.865000000000002) [done with that operating system process.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=4&mode=live&start=20.357000000000014) [Node has finished the process and the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=4&mode=live&start=22.680800000000005) [operating system terminated that process.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=4&mode=live&start=25.611) [A Node process, by default, will not keep](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=4&mode=live&start=28.012)[running in the background unless it has a](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=4&mode=live&start=31.708538461538467) [reason to. This 1-liner script here did](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=4&mode=live&start=35.16330769230768) [not really give the Node process a reason](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=4&mode=live&start=37.55776923076924) [to continue running. Let's now give the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=4&mode=live&start=40.007) [process a reason to continue running. We](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=4&mode=live&start=43.14676923076923) [can do so by starting an interval timer.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=4&mode=live&start=46.19511111111111) [We've learned about timers in a previous](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=4&mode=live&start=49.052) [module. Under the file 2-interval, there](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=4&mode=live&start=51.013750000000016) [is a simple interval call here that](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=4&mode=live&start=53.38566666666668) [executes a console. log line every 5](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=4&mode=live&start=56.314) [seconds. Go ahead and execute this file](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=4&mode=live&start=59.34412500000002) [now, node 2-interval, and note how the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=4&mode=live&start=62.617307692307705) [Node process now did not exit. It is](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=4&mode=live&start=65.931) [running and it will continue running](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=4&mode=live&start=69.43930769230765)[forever until it gets crashed by an](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=4&mode=live&start=72.03750000000001) [unexpected error, or the user kills it](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=4&mode=live&start=74.87600000000003) [manually with CTRL+C. The real reason that](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=4&mode=live&start=77.78637500000002) [process did not exist is that Node's Event](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=4&mode=live&start=80.62015384615383) [Loop is itself busy now. What is this](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=4&mode=live&start=83.76846153846147) [Event Loop thing, you ask? It is your best](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=4&mode=live&start=86.92875000000004) [friend in Node. It's the hidden magic that](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=4&mode=live&start=90.53814285714284)[will take care of anything asynchronous](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=4&mode=live&start=93.46300000000002) [for you and you don't have to worry about](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=4&mode=live&start=95.50300000000004) [working with threads. In other languages,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=4&mode=live&start=98.62336363636364) [if you need to do asynchronous work, you](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=4&mode=live&start=100.52007692307693) [have to manage threads yourself, you have](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=4&mode=live&start=102.79761538461541) [to start them, do the async work inside of](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=4&mode=live&start=105.01908333333333) [them, monitor them, make sure they don't](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=4&mode=live&start=107.97783333333334) [access shared data or if they do you want](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=4&mode=live&start=110.23825000000004) [to make sure that there are no race](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=4&mode=live&start=112.85499999999996) [conditions. It is a complicated task. Now](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=4&mode=live&start=115.05233333333325) [some languages make it easier than others,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=4&mode=live&start=117.46849999999998) [but I think the big winner in that domain](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=4&mode=live&start=119.92671428571428) [is Node because you just use Node's API](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=4&mode=live&start=122.77714285714283) [and Mr. Event Loop here will do all the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=4&mode=live&start=125.66800000000002) [heavy lifting. The Event Loop is just a](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=4&mode=live&start=129.32200000000006) [simple infinite loop that's built inside](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=4&mode=live&start=132.16199999999995) [Node and its main task is to monitor any](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=4&mode=live&start=134.1899999999999) [asynchronous operations that need to be](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=4&mode=live&start=137.13599999999994) [run, and figure out when they're ready to](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=4&mode=live&start=139.16216666666668) [be consumed. In this example, the Event](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=4&mode=live&start=142.0508333333334)[Loop will monitor the setInterval timer,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=4&mode=live&start=144.70209090909097) [and every 5 seconds it'll take the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=4&mode=live&start=147.017) [interval's callback, which is the first](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=4&mode=live&start=148.71566666666675) [argument to setInterval, the arrow](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=4&mode=live&start=150.29454545454544) [function here, and it'll send this arrow](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=4&mode=live&start=152.12227272727264) [function to V8, and V8 will execute what's](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=4&mode=live&start=154.98153846153843) [inside that function. Because this is an](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=4&mode=live&start=159.10769230769222) [every 5-second kind of thing, the Node](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=4&mode=live&start=161.83838461538463) [process is going to continue to run](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=4&mode=live&start=163.90930769230772) [forever, and it will not exit. So while](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=4&mode=live&start=166.09372727272722) [this Node process is running, if you go](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=4&mode=live&start=168.5922727272727) [to, in another terminal, and try the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=4&mode=live&start=170.94136363636352) [command ps -ef to to list all the running](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=4&mode=live&start=173.63585714285722) [processes, and pipe the output of this](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=4&mode=live&start=177.26841666666667) [command on grep node to just filter the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=4&mode=live&start=180.2883333333334) [list to any processes that are matching](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=4&mode=live&start=183.33400000000006) [the word "Node", you'll see the process](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=4&mode=live&start=185.64400000000015) [hosting our script, right here. You see](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=4&mode=live&start=189.57699999999994)[that? It is still running. Now I have a](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=4&mode=live&start=193.56371428571427) [few other processes that are matching](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=4&mode=live&start=196.7754285714285) ["Node", I think these are actually the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=4&mode=live&start=199.14199999999997) [Atom editor itself here. Believe it or](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=4&mode=live&start=202.16599999999988) [not, this Atom editor here is a Node](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=4&mode=live&start=204.70475000000002) [application! It is a complicated one, but](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=4&mode=live&start=206.86675000000005) [it simply run with Node using an](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=4&mode=live&start=208.96284615384621) [application called Electron, which allows](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=4&mode=live&start=211.093) [you to use web and Node technologies to](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=4&mode=live&start=212.883) [build cross-platform desktop applications](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=4&mode=live&start=216.10625) [for Mac, Windows, and Linux. How cool is](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=4&mode=live&start=218.25674999999995) [that. Okay, so our process here is the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=4&mode=live&start=221.62400000000002) [last one here because we started it last,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=4&mode=live&start=224.52692857142858) [so it will have the highest process ID.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=4&mode=live&start=226.35835714285724) [You can kill our continuously-running Node](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=4&mode=live&start=228.89866666666666) [process using the Linux kill command](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=4&mode=live&start=231.69) [itself and giving it the process ID here,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=4&mode=live&start=234.11) [but you can also kill any active Node](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=4&mode=live&start=237.31015384615384) [process using Ctrl+C on its output here,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=4&mode=live&start=240.4307692307692) [and that action will stop the event loop](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=4&mode=live&start=243.1047142857143) [and then remove the process from the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=4&mode=live&start=246.11214285714289)[operating system. Run the same ps -ef grep](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=4&mode=live&start=248.99899999999997) [Node command now and you'll see that the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=4&mode=live&start=251.95600000000007) [process that was hosting the interval file](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=4&mode=live&start=254.76) [is gone. Node's Event Loop works with](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=4&mode=live&start=257.54600000000005) [multiple phases and queues. At this point,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=4&mode=live&start=260.27977777777767) [what I want you to remember is that EVERY](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=4&mode=live&start=262.6451428571428) [Node process starts this infinite loop](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=4&mode=live&start=265.0905714285712) [that we call the Event Loop, but when the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=4&mode=live&start=266.7952307692308) [process has no asynchronous operations to](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=4&mode=live&start=269.408) [perform, the Event Loop will exit and the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=4&mode=live&start=271.92418181818186) [Operating System will terminate that Node process.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=4&mode=live&start=277.021)

[Errors vs. Exceptions](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=5&mode=live)

[Do you know the difference between errors](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=5&mode=live&start=1.468) [and exceptions? An error is simply a](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=5&mode=live&start=4.478777777777778) [problem, so applications should not really](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=5&mode=live&start=7.239416666666667) [catch that problem, they should just let](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=5&mode=live&start=9.519916666666667) [it happen, while an exception is a](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=5&mode=live&start=11.84353846153846) [condition, and applications usually catch](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=5&mode=live&start=14.111) [that condition and do something with it.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=5&mode=live&start=16.003777777777778) [Let's talk about that in Node. In the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=5&mode=live&start=18.58833333333334) [5-errors directory here, I have 3 files,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=5&mode=live&start=21.357307692307693) [the first file is 1-loop, and this file is](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=5&mode=live&start=23.55638461538462) [simply looping over an array of files.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=5&mode=live&start=26.811750000000004) [Those are actual files that I have in my](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=5&mode=live&start=29.61) [home directory, and they might be](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=5&mode=live&start=32.28954545454545) [MAC-specific, so you'll want to change](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=5&mode=live&start=34.044999999999995) [these files to something that you have in](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=5&mode=live&start=35.78499999999999) [your local home directory. Then in this](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=5&mode=live&start=38.6162) [section, I am looping over this files](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=5&mode=live&start=40.91776923076923) [array using a forEach call, and for each](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=5&mode=live&start=42.78623076923078) [file, we are basically reading the content](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=5&mode=live&start=45.59908333333334) [of the file. I use this path. resolve call](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=5&mode=live&start=48.416) [to find the path of the file, and then,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=5&mode=live&start=50.8568) [using the readFileSync method, which is](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=5&mode=live&start=53.89045454545454) [probably the first time we're seeing this](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=5&mode=live&start=56.70336363636361) [method, it's equivalent to readFile, but](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=5&mode=live&start=58.96850000000001) [it will do the reading synchronously, not](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=5&mode=live&start=60.74788888888889) [asynchronously. We're going to talk a](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=5&mode=live&start=63.911111111111104) [little bit more about that in a future](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=5&mode=live&start=65.44835714285715) [module, but for now, let's focus on](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=5&mode=live&start=67.18492857142859) [thinking about what's going to happen if](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=5&mode=live&start=69.26430769230772) [this code has an error, has a problem. So](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=5&mode=live&start=71.437) [let's quickly run this code and make sure](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=5&mode=live&start=74.60950000000005) [it doesn't have any problems as is. It is](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=5&mode=live&start=77.09979999999999) [running, and it's reading 2 files data.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=5&mode=live&start=79.38644444444444) [Very good. Now, what if I injected a file](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=5&mode=live&start=81.446) [here, that does not exist? So this file](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=5&mode=live&start=85.49985714285717) [now, in the middle, does not exist in my](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=5&mode=live&start=88.49899999999998) [home directory. What do you think the code](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=5&mode=live&start=90.73999999999994) [is going to do? The code is going to try](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=5&mode=live&start=92.91199999999998) [and read a file that does not exist, and](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=5&mode=live&start=96.00757142857141) [Node will crash and exit. So after reading](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=5&mode=live&start=99.03275000000001) [the first file successfully, for the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=5&mode=live&start=102.11875000000002) [second file, Node crashed and exited, so](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=5&mode=live&start=104.853)[we're not reading the third file here. And](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=5&mode=live&start=108.36383333333333) [this is normal. When Node executes an](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=5&mode=live&start=111.21849999999995) [error like this one, which is basically](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=5&mode=live&start=113.27799999999998) [not planned for, it will just crash. And](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=5&mode=live&start=115.00874999999994) [this is important to remember here because](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=5&mode=live&start=117.72875000000002) [although this process started the infinite](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=5&mode=live&start=120.40936363636365) [event loop to do any async actions, it](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=5&mode=live&start=123.15245454545459)[immediately stopped that loop when it](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=5&mode=live&start=126.25036363636364) [encountered this unexpected error. And I](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=5&mode=live&start=128.322) [say unexpected error here because the code](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=5&mode=live&start=131.65800000000007) [did not account for the possibility of an](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=5&mode=live&start=134.88174999999998) [error. We can make this code account for](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=5&mode=live&start=137.54774999999992) [the error by simply making an exception](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=5&mode=live&start=139.9018461538462) [for it. We write code to represent this](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=5&mode=live&start=142.1754) [exception. So let's assume that trying to](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=5&mode=live&start=146.50660000000008) [read a file that does not exist is not](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=5&mode=live&start=148.89280000000002) [really a problem for this code. We're](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=5&mode=live&start=151.66) [going to upgrade this case from a problem,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=5&mode=live&start=153.98992307692313) [which is an error, into a condition, which](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=5&mode=live&start=156.78407692307692) [is an exception. And the easiest way to do](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=5&mode=live&start=159.97238461538464) [that is through a try/catch statement. So](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=5&mode=live&start=163.21650000000005) [if you look at the second file under this](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=5&mode=live&start=165.57299999999998) [folder here 2-try, you'll notice that this](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=5&mode=live&start=168.3449999999999) [file is injecting the same not-found file,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=5&mode=live&start=170.75590909090909) [and it's exactly the same code except now,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=5&mode=live&start=173.358) [I've put the code inside a try/catch](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=5&mode=live&start=175.9437142857144) [statement. So try this code, and then](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=5&mode=live&start=178.4229090909091) [catch an error. And inside this catch](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=5&mode=live&start=182.20227272727263) [block we can do whatever we want with this](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=5&mode=live&start=185.30146666666667) [error object. Once you catch the error](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=5&mode=live&start=188.63026666666667) [like this, the node process will not crash](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=5&mode=live&start=191.33461538461535) [and exit when it encounters any errors](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=5&mode=live&start=194.478) [within the catch block. When we run this](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=5&mode=live&start=197.1195454545455) [file, Node 2-try. js, and because it is](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=5&mode=live&start=200.02328571428572) [going to generate an error, but that error](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=5&mode=live&start=202.81185714285718) [is wrapped inside a try/catch statement,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=5&mode=live&start=205.0340909090909) [the catch block will be executed. So note](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=5&mode=live&start=206.844) [how the Node process did not crash and](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=5&mode=live&start=210.79018181818182) [exit. We just got a file-not-found message](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=5&mode=live&start=213.6389090909091) [for the second file, and then the Node](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=5&mode=live&start=215.6703846153846) [process continued to read the third file,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=5&mode=live&start=217.95572727272727)[because the file-not- found is no longer a](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=5&mode=live&start=220.27081818181819) [problem here, it's just an exception. It](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=5&mode=live&start=223.0334545454545) [is okay to encounter files that do not](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=5&mode=live&start=225.46099999999998) [exist, and just continue with your code.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=5&mode=live&start=227.88499999999996) [So this is a great feature, but it's also](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=5&mode=live&start=230.21819999999997) [a dangerous one. This code means that](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=5&mode=live&start=233.58179999999984) [we're okay with files not being found when](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=5&mode=live&start=235.64515384615382) [we attempt to read them, but it also means](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=5&mode=live&start=237.52946153846145) [that we're okay with any errors that](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=5&mode=live&start=240.08684615384607) [happens when we read a file, not just the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=5&mode=live&start=242.098)[error about files not being found. If for](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=5&mode=live&start=244.61800000000002) [example, the file is found, but has](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=5&mode=live&start=247.3178181818182) [corrupt data, we'll treat that other error](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=5&mode=live&start=249.77316666666667) [exactly the same, making the console. log](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=5&mode=live&start=252.12575) [line here not really an accurate one. Let](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=5&mode=live&start=254.88854545454544) [me simulate that. The second argument for](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=5&mode=live&start=258.5005) [readFileSync accepts encoding string. So](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=5&mode=live&start=262.2909999999999) [you can pass in utf-8 here to say I'd like](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=5&mode=live&start=264.711125) [to encode the content of this file when I](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=5&mode=live&start=267.25237499999986) [read it with utf-8. Let's pass an invalid](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=5&mode=live&start=270.6984285714285) [encoding label. If you execute the code](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=5&mode=live&start=275.0492857142855) [now, because we did try/catch, and because](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=5&mode=live&start=278.37899999999996) [we're generically saying file-not-found](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=5&mode=live&start=281.4358888888888) [when you encounter an error, we're going](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=5&mode=live&start=283.0656666666665) [to see the file-not-found message for all](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=5&mode=live&start=285.3784615384616) [of them. But really the error that](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=5&mode=live&start=287.2867692307693) [happened was not file-not-found, the error](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=5&mode=live&start=289.8669999999999) [that's happening here is that the second](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=5&mode=live&start=292.10069230769227) [argument here is an invalid encoding](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=5&mode=live&start=294.2206153846152) [label. So this console. log message is no](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=5&mode=live&start=296.41016666666667) [longer accurate. A more accurate message](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=5&mode=live&start=300.3228333333333) [here would be "Something went wrong and we](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=5&mode=live&start=302.84133333333335) [are going to ignore it" because this is](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=5&mode=live&start=305.922) [just a generic catching of the error. And](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=5&mode=live&start=308.4857333333334) [this is not good. Here's the thing, if you](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=5&mode=live&start=310.98019999999997) [want your code to only catch the case when](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=5&mode=live&start=313.2409999999998) [the file is not found, you should make](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=5&mode=live&start=315.62357142857144) [this catch statement here a bit more](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=5&mode=live&start=317.8767142857143) [specific. And in the third file here](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=5&mode=live&start=319.7161538461538) [you're going to see an example of that. So](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=5&mode=live&start=321.50276923076916) [take a look at 3-throw and you'll notice](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=5&mode=live&start=323.85773333333344) [the exact same code, except we're now not](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=5&mode=live&start=326.1028181818182) [generically catching the error message. We](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=5&mode=live&start=329.36536363636367) [have an if statement. And this if](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=5&mode=live&start=331.78200000000004)[statement is basically saying only ignore](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=5&mode=live&start=334.42025) [the error if it's a file not found error.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=5&mode=live&start=336.49475000000007) [Otherwise, throw the error object again,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=5&mode=live&start=340.11999999999995) [and this throw line is what Node would](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=5&mode=live&start=342.708) [have done with the error if we did not](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=5&mode=live&start=344.91013333333325) [have a try/catch statement, making this](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=5&mode=live&start=347.4566666666667) [code only ignore a specific case and](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=5&mode=live&start=349.31566666666686)[perform the default behavior otherwise. In](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=5&mode=live&start=351.99762499999997) [Node, the default behavior for an error is](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=5&mode=live&start=354.72142857142853) [to let the process exit because the state](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=5&mode=live&start=357.27685714285735) [of that process is unknown and it's not](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=5&mode=live&start=359.68076923076933) [safe to continue running with an unknown](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=5&mode=live&start=361.83215384615414) [state. So let's try this one. Node](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=5&mode=live&start=364.5081818181817) [3-throw. This is fine because this is](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=5&mode=live&start=367.4249090909091) [actually a file-not-found error, and now](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=5&mode=live&start=369.8812727272729) [let's simulate a bad encoding string, run](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=5&mode=live&start=372.32975) [this process again, and the process will](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=5&mode=live&start=375.5864999999998) [crash and exit, because this is a problem,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=5&mode=live&start=378.3516153846153) [this is an unknown error. It's a problem.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=5&mode=live&start=381.287) [And the safest to do for a problem is to just let the process crash and exit.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=5&mode=live&start=384.317)

[Node Clusters](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=6&mode=live)

[Okay, you might be wondering now, if it's](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=6&mode=live&start=0.748) [a normal thing for a Node process to crash](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=6&mode=live&start=2.9028571428571426) [and exit and we should definitely let it](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=6&mode=live&start=5.423153846153845) [do so. How is this going to be an](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=6&mode=live&start=7.834230769230764) [acceptable thing in production? Remember](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=6&mode=live&start=10.794090909090913) [when we talked about why Node is named](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=6&mode=live&start=12.4773) [Node? Because you don't run a single Node](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=6&mode=live&start=15.167699999999996) [process in production. You run many. One](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=6&mode=live&start=17.474500000000006) [working process existing should not mean](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=6&mode=live&start=19.76928571428571) [the system is down. You should be running](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=6&mode=live&start=21.94471428571428) [a cluster of Node processes. And that](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=6&mode=live&start=24.639888888888894) [cluster will have a master process, which](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=6&mode=live&start=26.71436363636364) [should be monitoring your application](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=6&mode=live&start=28.528636363636373) [worker processes. This is true even if](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=6&mode=live&start=31.193799999999996) [you're running a Node application on a](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=6&mode=live&start=34.04892857142859) [single server. It's often the case where](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=6&mode=live&start=36.042428571428616) [production servers will have many CPU](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=6&mode=live&start=38.272000000000006) [cores. You should be running a Node](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=6&mode=live&start=40.26400000000001) [process for each core. If you're not](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=6&mode=live&start=42.65039999999998) [running a cluster in that case, you're not](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=6&mode=live&start=44.718) [really utilizing the full power of your](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=6&mode=live&start=46.57933333333334) [machine. And even if your single](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=6&mode=live&start=49.36028571428572) [production server has a single core, you](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=6&mode=live&start=51.68045454545456) [should be running a cluster anyway because](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=6&mode=live&start=54.215916666666665) [that cluster has the simple job of](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=6&mode=live&start=56.04233333333333) [monitoring the actual Node process and](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=6&mode=live&start=58.12799999999999) [starting a new one when a process crashes](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=6&mode=live&start=60.21199999999998) [and exists. You can run a simple cluster](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=6&mode=live&start=63.913285714285706) [in Node using the built-in cluster module,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=6&mode=live&start=66.63749999999996) [and I go in depth about that topic in the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=6&mode=live&start=68.55778571428571) [Advanced Node. js course here at](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=6&mode=live&start=71.15564285714284) [Pluralsight. Alternatively, you can use](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=6&mode=live&start=73.55575) [one of the many tools that wrap the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=6&mode=live&start=75.14215384615386) [cluster module to run your Node](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=6&mode=live&start=77.23446153846157) [application in production. PM2 is one](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=6&mode=live&start=79.32037499999998) [example of these tools. If you run your](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=6&mode=live&start=81.29146153846156) [Node application through a tool like PM2,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=6&mode=live&start=83.62869230769238) [that tool can automatically use all the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=6&mode=live&start=85.99841666666667) [available cores in your server, and it](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=6&mode=live&start=88.498) [will automatically create a new process](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=6&mode=live&start=90.47841666666666) [every time an active process crashes and](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=6&mode=live&start=92.30766666666666) [exits. PM2 can also reload your](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=6&mode=live&start=95.2103333333333) [application without any downtime. A tool like PM2 is really a must in production.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=6&mode=live&start=97.64555555555553)

[Node’s Asynchronous Patterns](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=7&mode=live)

[Node originally used the callback pattern](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=7&mode=live&start=1.228) [for everything asynchronous. Today, Node](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=7&mode=live&start=4.0280000000000005) [is changing and its incrementally adopting](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=7&mode=live&start=6.3306) [other patterns as they surface in the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=7&mode=live&start=9.0384) [JavaScript language itself. Let me show](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=7&mode=live&start=12.0335) [you some examples of that. Under the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=7&mode=live&start=14.393749999999999) [async-patterns here, there are 6 files.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=7&mode=live&start=17.140500000000003) [Let's start with 1-sync. This is the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=7&mode=live&start=19.857) [pattern usually used in other programming](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=7&mode=live&start=23.081500000000005) [environments. Slow actions are usually](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=7&mode=live&start=25.845357142857154) [handled with threads directly and the code](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=7&mode=live&start=27.68490909090909) [does not have any patterns to consume data](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=7&mode=live&start=30.098) [coming from these slow actions. You can do](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=7&mode=live&start=32.95707692307692) [that as well in Node. We've seen this](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=7&mode=live&start=35.809692307692316) [readFileSync method in previous videos.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=7&mode=live&start=38.65153846153849) [It's the synchronous version that Node](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=7&mode=live&start=40.3778) [makes available to read file. You don't](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=7&mode=live&start=42.4094) [need any pattern to consume its data. You](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=7&mode=live&start=44.52723076923076) [get the data when you call that method,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=7&mode=live&start=46.84507142857143) [and the whole program here does not go](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=7&mode=live&start=48.781642857142856)[through the Event Loop. We're directly](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=7&mode=live&start=50.75672727272726) [using the Operating System synchronous](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=7&mode=live&start=52.28618181818179) [file reading API. When you execute this](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=7&mode=live&start=54.805499999999995) [code, you'll see the File data console.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=7&mode=live&start=58.385153846153855) [log line before the TEST console. log line](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=7&mode=live&start=61.132923076923106) [because it's all synchronous. Now look at](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=7&mode=live&start=64.765) [the 2-cb-pattern file here. This one is](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=7&mode=live&start=67.96300000000001) [using the readFile method from the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=7&mode=live&start=70.99633333333337) [built-in fs module. This method is](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=7&mode=live&start=73.36414285714284) [asynchronous. It needs to go through the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=7&mode=live&start=75.46799999999999) [Event Loop. We can't access the data](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=7&mode=live&start=77.74999999999994) [directly after calling this method. This](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=7&mode=live&start=80.568) [is why Node came up with this callback](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=7&mode=live&start=83.04599999999999) [pattern where the last argument of any](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=7&mode=live&start=85.54199999999997) [asynchronous function, like readFile here,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=7&mode=live&start=88.10263636363638) [is itself a function, which is known as a](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=7&mode=live&start=90.29036363636367) [callback function. This callback function](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=7&mode=live&start=93.85374999999998) [is always the last argument of the host](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=7&mode=live&start=95.84525) [function. The Event Loop will make this](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=7&mode=live&start=99.15524999999994) [callback executed when the operating](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=7&mode=live&start=101.32100000000001) [system is ready with data for us as I](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=7&mode=live&start=102.781) [explained in the first module of this](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=7&mode=live&start=105.61335294117646) [course. One thing I want you to notice](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=7&mode=live&start=107.81629411764703) [about the callback pattern is how the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=7&mode=live&start=109.64999999999999) [callback function always receives an error](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=7&mode=live&start=111.169) [object as its first argument. The data](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=7&mode=live&start=113.98572727272723) [comes after that in the second argument](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=7&mode=live&start=116.92576923076922) [and sometimes in many arguments after](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=7&mode=live&start=119.0004615384615) [that. This first error argument is](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=7&mode=live&start=121.0750909090909) [standard in the Node idiomatic callback](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=7&mode=live&start=123.74236363636359) [pattern, which is why it's that pattern is](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=7&mode=live&start=126.08127272727272) [often referred to as the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=7&mode=live&start=128.762) [error-first-callback pattern. If there is](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=7&mode=live&start=131.81485714285716) [an error in the code, the error-first](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=7&mode=live&start=133.9789375) [argument will be an error object. And If](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=7&mode=live&start=136.179125) [there is no error in the code, this first](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=7&mode=live&start=138.5802857142857) [argument will be passed as null. When we](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=7&mode=live&start=140.8990714285714) [execute this file, you'll see the TEST](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=7&mode=live&start=143.61892307692307) [line first, and then the File data line](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=7&mode=live&start=146.34461538461537) [because of how readFile is async.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=7&mode=live&start=150.34169230769234) [Basically this code was executed in two](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=7&mode=live&start=153.434) [iterations of the Event Loop. The first](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=7&mode=live&start=156.21999999999997) [iteration executed readFile itself and the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=7&mode=live&start=158.9070909090909) [console. log TEST line, and that first](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=7&mode=live&start=160.99836363636356) [iteration only defined the callback](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=7&mode=live&start=164.62400000000005) [function. And also, in that same](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=7&mode=live&start=167.8490000000001) [iteration, Node will ask the operating](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=7&mode=live&start=170.15435714285712) [system for data. Later on, once the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=7&mode=live&start=172.14678571428567) [operating system is ready with data, and](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=7&mode=live&start=174.3565384615384) [this could be a few seconds later, the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=7&mode=live&start=176.48023076923062) [event loop will go through another](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=7&mode=live&start=179.06600000000003) [iteration where it will now invoke the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=7&mode=live&start=181.045) [callback function and execute the console.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=7&mode=live&start=184.14218181818185) [log on line 4 here. This callback pattern](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=7&mode=live&start=186.6903333333333) [is good, but limited, and it introduces](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=7&mode=live&start=189.80366666666654) [some complexities and inconveniences. One](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=7&mode=live&start=193.19144444444447) [famous inconvenience about callbacks is](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=7&mode=live&start=195.59216666666666) [the fact that we need to nest them inside](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=7&mode=live&start=197.15799999999996) [each other if we're to make asynchronous](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=7&mode=live&start=200.17649999999998) [actions that depend on each other. Here's](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=7&mode=live&start=202.83533333333324) [an example under 3-cb-nesting. js. We](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=7&mode=live&start=206.14499999999995) [start with the same readFile method here](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=7&mode=live&start=208.90142857142857) [to read the data of a file, and then once](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=7&mode=live&start=210.3464285714286) [we have that data, we'll use another fs](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=7&mode=live&start=212.71207692307698) [method here, writeFile, to create a copy](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=7&mode=live&start=214.96623076923092) [of this file. Note how I needed to nest](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=7&mode=live&start=217.63800000000003) [the callback of the second operation](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=7&mode=live&start=221.21823076923076) [within the callback of the first](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=7&mode=live&start=223.60346153846152) [operation, and If I have yet another async](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=7&mode=live&start=225.5575384615384) [operation to be done after the writeFile,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=7&mode=live&start=228.048) [I'll have to do more nesting here. This](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=7&mode=live&start=230.63850000000005) [problem is famously known as the pyramid](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=7&mode=live&start=233.50008333333335) [of doom in computer programming and it's](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=7&mode=live&start=235.3976666666667) [not ideal. It makes the code harder to](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=7&mode=live&start=237.53600000000003) [write, read, and maintain. Luckily, since](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=7&mode=live&start=240.34666666666678) [the JavaScript language adopted the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=7&mode=live&start=242.8702222222222) [promise pattern which we talked about in](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=7&mode=live&start=244.88309090909092) [the modern JavaScript course module, Node](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=7&mode=live&start=246.80872727272737) [is doing that as well! Look at](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=7&mode=live&start=249.011375) [4-promisify. js. Node today comes with a](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=7&mode=live&start=252.00757142857142) [tool that you can use to promisify any](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=7&mode=live&start=254.45957142857145) [built-in asynchronous API method. And this](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=7&mode=live&start=257.8442857142857) [is a very good start. In this example, I](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=7&mode=live&start=260.5875714285714) [am using the promisify function to create](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=7&mode=live&start=263.1326428571426) [a new version of readFile, one that does](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=7&mode=live&start=265.3216666666667) [need a callback, but rather returns a](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=7&mode=live&start=268.003) [promise. And since it is returning a](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=7&mode=live&start=271.20725000000016) [promise, I am able to consume this promise](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=7&mode=live&start=273.42000000000013) [using the async/await feature. You can](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=7&mode=live&start=275.76) [promisify any asynchronous action that's](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=7&mode=live&start=278.74733333333336) [designed according to Node's idiomatic](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=7&mode=live&start=281.11788888888884) [callback pattern (callback-last argument,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=7&mode=live&start=283.310111111111) [err-first argument within that callback).](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=7&mode=live&start=285.3747142857143) [Not only that, Node also ships first-level](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=7&mode=live&start=288.344) [support for promises in some modules as](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=7&mode=live&start=291.0561818181818) [well. This fs module is one of them. You](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=7&mode=live&start=293.7948181818182) [don't really need to use the promisify](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=7&mode=live&start=297.2657692307692) [function here, you can just use the native](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=7&mode=live&start=299.37115384615373)[promises returned by the fs module itself.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=7&mode=live&start=302.05459999999994) [Look at 5-fs-promises. js and compare with](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=7&mode=live&start=304.807) [the 4-promisify. js file, we're](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=7&mode=live&start=308.891181818182) [destructuring the readFile method here](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=7&mode=live&start=311.6297) [from a special object. The promises object](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=7&mode=live&start=313.65319999999997) [that's attached to the top-level API of](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=7&mode=live&start=316.6125384615384) [the fs module. By doing so, you get a](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=7&mode=live&start=319.7404615384614) [promise-based readFile out of the box, and](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=7&mode=live&start=323.3554999999999) [you can consume it with the async/await as](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=7&mode=live&start=325.90441666666663) [we did before. How cool is that. This is](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=7&mode=live&start=328.09974999999974) [the near future of all of Node's APIs.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=7&mode=live&start=330.8785714285714) [Promises are better than Callbacks. The](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=7&mode=live&start=333.486) [code is easier to read here, and promises](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=7&mode=live&start=335.24649999999986) [open the door to so much flexibility to](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=7&mode=live&start=337.729) [nest operations and even loop over them.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=7&mode=live&start=340.6169999999999) [Take a look at 6-promise-nesting. js and](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=7&mode=live&start=343.37) [compare it with 3-cb- nesting. js, and see](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=7&mode=live&start=346.4080000000002) [how I made the exact same copy example,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=7&mode=live&start=349.7353333333333) [but with promises this time. And look how](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=7&mode=live&start=352.918) [much more readable this is. We just await](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=7&mode=live&start=355.7499999999999) [on readFile, and then we await on](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=7&mode=live&start=358.55036363636367) [writeFile. And if we need to await](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=7&mode=live&start=360.9545454545456) [further, we just do it line by line. There](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=7&mode=live&start=362.86442857142856) [is no nesting going on here and that would make this code a lot easier to deal with.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=7&mode=live&start=365.2035333333333)

[Event Emitters](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=8&mode=live)

[There is a library in Node called Event](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=8&mode=live&start=1.418) [Emitter, and it's an important one. So](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=8&mode=live&start=3.605999999999999) [let's talk about it here in this video.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=8&mode=live&start=5.546222222222222) [Under the 7-event-emitters folder here,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=8&mode=live&start=7.94) [there is an example. js for us to work an](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=8&mode=live&start=9.847500000000004) [example on event emitting. And this is how](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=8&mode=live&start=13.906142857142859) [we use the Event Emitter. We require the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=8&mode=live&start=16.77053846153846)[events library, which is built-in, we](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=8&mode=live&start=18.79761538461538) [don't need to npm install anything here,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=8&mode=live&start=20.52554545454545) [and we usually name the result of](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=8&mode=live&start=22.602333333333334) [requiring the event library, the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=8&mode=live&start=24.75366666666666) [EventEmitter class, just like this. The](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=8&mode=live&start=26.357083333333335) [events library is one of the most](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=8&mode=live&start=28.601583333333345) [important built-in libraries in Node](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=8&mode=live&start=31.005636363636363) [because most of the other modules](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=8&mode=live&start=32.339727272727266) [implement the Event Emitter module. For](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=8&mode=live&start=34.48614285714285) [example, streams in Node are event](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=8&mode=live&start=37.51475) [emitters. We've seen a few streams when we](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=8&mode=live&start=39.49925000000001)[talked about the process object, remember?](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=8&mode=live&start=43.83884615384615) [event emitters as well, and in the next](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=8&mode=live&start=47.275) [module, we'll work with more streams. So](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=8&mode=live&start=49.316714285714305) [let's understand event emitters on their](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=8&mode=live&start=51.14977777777778) [own first. After requiring the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=8&mode=live&start=52.960444444444455) [EventEmitter class, like this, we create](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=8&mode=live&start=54.71845454545455) [an event emitter object, let me put it in](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=8&mode=live&start=57.027363636363646) [a constant, name it myEmitter, and we use](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=8&mode=live&start=60.71775000000002) [the new keyword on the EventEmitter class.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=8&mode=live&start=63.96979999999999) [So myEmitter is now an object that can](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=8&mode=live&start=66.69) [emit events. An event emitting object has](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=8&mode=live&start=70.08599999999996) [many methods, but here are the 2 most](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=8&mode=live&start=73.01000000000003) [important ones. You can emit a string.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=8&mode=live&start=76.33000000000008) [This string is a name that can be anything](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=8&mode=live&start=78.85866666666664) [and you use it to identify a certain](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=8&mode=live&start=81.91626666666659) [event. So let's emit a TEST\_EVENT string](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=8&mode=live&start=85.89973333333333) [here. Now, the other method on any emitter](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=8&mode=live&start=89.54346666666666) [object, is how you can subscribe to events](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=8&mode=live&start=92.89253846153849) [emitted by this object, and you do that](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=8&mode=live&start=96.098) [using the. on method. You say, myEmitter.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=8&mode=live&start=99.22200000000002) [on this TEST\_EVENT string, and then you](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=8&mode=live&start=102.26946153846153) [pass in a callback function in here as a](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=8&mode=live&start=105.73553846153841) [second argument. The myEmitter object will](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=8&mode=live&start=110.05299999999997) [invoke this callback function every time](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=8&mode=live&start=112.62063636363636) [the event represented by this string is](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=8&mode=live&start=115.05609090909091) [fired. So let me put a console. log line](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=8&mode=live&start=118.47485714285715) [here and log something like TEST\_EVENT was](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=8&mode=live&start=122.22253846153845) [fired. Here's how this event emitting](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=8&mode=live&start=125.64260000000002) [business is a lot more flexible than](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=8&mode=live&start=129.81740000000002) [single callbacks. You can do this. on](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=8&mode=live&start=133.50542857142864) [operation multiple times! This gives you](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=8&mode=live&start=136.978375) [the flexibility of defining different](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=8&mode=live&start=139.5217) [behaviors in different functions in](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=8&mode=live&start=141.20620000000008) [response to a single event. Okay here is](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=8&mode=live&start=143.38074999999998)[another one of them interview questions.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=8&mode=live&start=147.074) [If we invoke this file now, how many times](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=8&mode=live&start=149.458) [will we see the "TEST\_EVENT was fired](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=8&mode=live&start=152.38942857142868) [message"? Think about it. And let me](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=8&mode=live&start=155.0415) [execute this file (node example. js) to](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=8&mode=live&start=158.62375000000006) [test, and that console. log line was](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=8&mode=live&start=162.3675714285714) [invoked ZERO times. The reason here is](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=8&mode=live&start=166.2325714285714) [order. We subscribed to the TEST\_EVENT](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=8&mode=live&start=169.55154545454548) [three times, but that TEST\_EVENT was not](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=8&mode=live&start=172.04536363636367) [fired after we subscribed to it. It was](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=8&mode=live&start=175.11749999999995) [emitted once BEFORE we subscribed, but no](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=8&mode=live&start=178.44173333333333) [one was listening at that point. If you](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=8&mode=live&start=180.7788) [emit the event after subscribing to it,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=8&mode=live&start=183.33114285714285) [you should now see the three callbacks](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=8&mode=live&start=185.2531428571428) [getting executed. Here is another](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=8&mode=live&start=187.92088888888887) [interview question. If I don't emit this](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=8&mode=live&start=191.15811111111103) [event after the subscription that I just](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=8&mode=live&start=194.23338461538464) [did, and I just keep this line here, what](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=8&mode=live&start=196.72592307692312) [can I do to this line to make it trigger](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=8&mode=live&start=198.85376470588233) [the subscribers callbacks that happened](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=8&mode=live&start=201.25575) [after it, without moving it to after the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=8&mode=live&start=203.2995)[subscribe calls? I can use the Event Loop.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=8&mode=live&start=207.38850000000005) [I can delay the execution of this line to](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=8&mode=live&start=210.26459999999994) [the next tick of the event loop by using a](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=8&mode=live&start=212.943) [simple setImmediate call, for example.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=8&mode=live&start=215.72700000000006) [Here's how to do that. If we wrap this](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=8&mode=live&start=217.119) [emit line with a setImmediate call, the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=8&mode=live&start=221.67428571428576) [callback of setImmediate will be placed on](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=8&mode=live&start=225.11366666666666) [the event loop, and it'll be invoked after](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=8&mode=live&start=228.29399999999993) [the rest of this program is executed. So](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=8&mode=live&start=231.35324999999997) [these three subscribe calls will happen](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=8&mode=live&start=234.06083333333333)[before the emit call in that case, and we](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=8&mode=live&start=236.0578333333333) [see the "TEST\_EVENT was fired" message.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=8&mode=live&start=239.3656) [This is event emitting. Very simple yet](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=8&mode=live&start=241.831) [very powerful because it allows for](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=8&mode=live&start=244.42163636363642) [modules to work together without depending on any APIs.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=8&mode=live&start=247.902)

[Wrap Up](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=9&mode=live)

[This was an important module in the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=9&mode=live&start=0.393) [course. We talked about how to define and](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=9&mode=live&start=3.237625000000001) [use modules in Node and we've seen some](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=9&mode=live&start=5.8725) [examples to define and use multiple types](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=9&mode=live&start=8.5487) [of APIs. We talked about the special](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=9&mode=live&start=11.682599999999995) [global object and how you should avoid](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=9&mode=live&start=14.325142857142858) [using it. We then talked about Node's](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=9&mode=live&start=16.77114285714286) [Event Loop, the hidden magic that allows](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=9&mode=live&start=19.130000000000003) [you to easily do asynchronous programming](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=9&mode=live&start=21.454) [in Node without using any threads. We](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=9&mode=live&start=24.074999999999996)[briefly talked about error handling and](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=9&mode=live&start=27.038076923076925) [how to make exceptions for problems. We](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=9&mode=live&start=29.09053846153847) [talked about the concept of Clusters in](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=9&mode=live&start=31.366307692307693) [Node and how a master process can restart](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=9&mode=live&start=32.92946153846154) [other workers when they have problems. We](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=9&mode=live&start=35.585333333333324) [looked at Node's asynchronous pattern and](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=9&mode=live&start=39.02045454545455) [saw how the promise pattern is a lot more](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=9&mode=live&start=41.15918181818183) [flexible and readable than the callback](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=9&mode=live&start=44.232083333333335) [one. And finally, we went through a simple](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=9&mode=live&start=46.20858333333334) [example for the Event Emitter module,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=9&mode=live&start=48.26933333333331) [which is an important one because most](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=9&mode=live&start=49.812583333333336) [other modules in Node use the Event](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=9&mode=live&start=51.95866666666669) [Emitter module one way or another. In the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=9&mode=live&start=54.35133333333333) [next module of this course, we'll talk](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=9&mode=live&start=57.26323076923077) [about Web servers and how Node provides](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=9&mode=live&start=59.29053846153849) [some utilities to program these type of servers.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=299838e7-4887-49f8-8dd4-052acbaed8f3&clip=9&mode=live&start=63.449)

[Working with Web Servers](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=0&mode=live)

[Hello World... The Node’s Version](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=0&mode=live)

[Node makes it very easy for you to do](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=0&mode=live&start=0) [network programming and create a full and](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=0&mode=live&start=3.7549285714285707) [customizable web server, and it's all](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=0&mode=live&start=6.652166666666667) [built in the runtime. We've seen this](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=0&mode=live&start=9.085666666666665) [hello world example in the second module](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=0&mode=live&start=11.43775) [of this course when we talked about](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=0&mode=live&start=13.140499999999998) [requiring scripts. I've placed here under](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=0&mode=live&start=15.284142857142855)[the folder 5-web to talk a little bit more](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=0&mode=live&start=17.178692307692312) [about the http module. As you know, this](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=0&mode=live&start=19.95) [http module is a built-in one, it comes](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=0&mode=live&start=22.224461538461536) [with Node. This is why we were able to run](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=0&mode=live&start=24.3176) [this code without needing to npm install](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=0&mode=live&start=26.55626666666666) [anything, but if instead of http here, we](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=0&mode=live&start=28.543166666666675) [wanted to use another web framework, say](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=0&mode=live&start=31.06027272727273) [express for example, we would need to npm](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=0&mode=live&start=33.59618181818181) [install the express package, in this](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=0&mode=live&start=36.57883333333332) [folder, before we can use it. But we don't](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=0&mode=live&start=38.8538333333333)[need to install anything for the built-in](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=0&mode=live&start=40.823285714285696) [http module. The require call here](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=0&mode=live&start=42.656888888888886) [returned something. It's just a function](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=0&mode=live&start=46.502222222222215) [call and if you remember from the previous](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=0&mode=live&start=48.687999999999995) [module of the course, this require call](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=0&mode=live&start=50.49599999999999) [returns the API of the module that we are](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=0&mode=live&start=52.827999999999996) [requiring. In here, we're capturing the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=0&mode=live&start=55.98699999999999)[API of the http module into a local](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=0&mode=live&start=57.799923076923065) [variable, which we also named http. We](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=0&mode=live&start=60.139) [don't have to, but that's usually the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=0&mode=live&start=62.8494) [convention. The local http variable now](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=0&mode=live&start=65.51572727272728) [has all the methods defined on the public](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=0&mode=live&start=67.7728181818182) [API of the http module. For example, one](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=0&mode=live&start=70.56808333333336) [of these methods is createServer, which](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=0&mode=live&start=73.2385)[we're using here. The createServer is a](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=0&mode=live&start=75.12349999999999) [function that accepts an argument and its](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=0&mode=live&start=77.28781818181821) [argument is also a function. This is why](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=0&mode=live&start=79.426) [we have an inline function reference here.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=0&mode=live&start=82.04360000000004) [This might be a bit confusing. If you](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=0&mode=live&start=84.334) [heard the term that functions are first](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=0&mode=live&start=86.93338461538457) [class citizens in JavaScript, this here is](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=0&mode=live&start=89.182)[exactly what we mean by that. We can pass](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=0&mode=live&start=91.36599999999999) [functions as arguments to other functions.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=0&mode=live&start=94.734) [Another term that you might've heard of](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=0&mode=live&start=97.166) [here is the term higher order functions.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=0&mode=live&start=99.44899999999998) [Those are functions that receive other](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=0&mode=live&start=101.732) [functions as arguments, or return other](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=0&mode=live&start=104.26333333333332) [functions. In our code sample here, the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=0&mode=live&start=106.82733333333331) [createServer function is a higher order](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=0&mode=live&start=109.79150000000001) [function because it receives another](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=0&mode=live&start=111.99650000000005) [function as an argument. So let me improve](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=0&mode=live&start=113.85816666666666)[this code a little bit by extracting this](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=0&mode=live&start=116.8948333333333) [anonymous function that we're passing to](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=0&mode=live&start=119.80745454545456) [createServer, and give it a name instead.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=0&mode=live&start=122.0505) [So I'm going to capture it in a const](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=0&mode=live&start=125.19) [here, and let's name it requestListerner](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=0&mode=live&start=127.20085714285713) [here, and I'm just going to paste the code](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=0&mode=live&start=128.67350000000002) [that I just cut from createServer. Now the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=0&mode=live&start=131.87300000000008) [createServer method can be passed the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=0&mode=live&start=135.71654545454544) [requestListener variable itself, which](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=0&mode=live&start=138.74827272727273) [holds a reference to the function. This is](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=0&mode=live&start=140.43336363636368) [equivalent to what we had before.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=0&mode=live&start=143.71500000000003) [Important side note here, you pass in the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=0&mode=live&start=145.9770000000001) [function reference here, you do not call](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=0&mode=live&start=149.28200000000004) [it, like that, this is a big difference.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=0&mode=live&start=152.42675000000008) [By calling the function, the argument](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=0&mode=live&start=155.43163636363627) [value here becomes what the function](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=0&mode=live&start=157.4526666666667) [returns, not the function itself. What we](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=0&mode=live&start=159.13466666666676) [want here is to pass a reference to the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=0&mode=live&start=161.77599999999993) [function itself, which is basically a](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=0&mode=live&start=165.16645454545454) [pointer to where the function is defined.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=0&mode=live&start=166.62118181818175) [Listener functions receive two objects,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=0&mode=live&start=169.28787500000004) [the request object, and the response](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=0&mode=live&start=172.116) [object. Now I named them req and res here,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=0&mode=live&start=174.13199999999992) [but you can really name them anything.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=0&mode=live&start=176.28986666666665) [These are positional arguments, the first](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=0&mode=live&start=177.884) [argument represents the request side of a](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=0&mode=live&start=180.18399999999994) [request event, and the second argument](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=0&mode=live&start=183.00672727272723) [represents the response side of a request](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=0&mode=live&start=185.51581818181808) [event. They're famously named req and res.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=0&mode=live&start=188.03492307692315) [So the requestListener here is a function](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=0&mode=live&start=190.486) [that will be invoked every time there is a](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=0&mode=live&start=193.0935) [request event. This is important.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=0&mode=live&start=196.54888888888885) [Remember, when we talked about Event](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=0&mode=live&start=198.54) [Emitters in the previous module? Well,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=0&mode=live&start=200.05309090909086) [guess what? This server object that we get](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=0&mode=live&start=201.60946153846155) [as a result of calling the createServer](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=0&mode=live&start=203.97315384615396) [method is an Event Emitter, and one of the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=0&mode=live&start=206.30425) [events it emits is named "request". In](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=0&mode=live&start=209.752) [fact, this same code can be rewritten](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=0&mode=live&start=212.19553846153846) [using the event emitter API. Instead of](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=0&mode=live&start=214.70069999999998) [passing the requestListener function to](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=0&mode=live&start=217.57559999999992)[createServer, we can use a call to server.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=0&mode=live&start=219.98099999999997) [on, the event name is "request", and pass](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=0&mode=live&start=224.29684615384616) [the requestListener right here. Every time](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=0&mode=live&start=229.2556153846155) [we have a request event coming to this](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=0&mode=live&start=232.62900000000002) [server, we're instructing the server](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=0&mode=live&start=236.20500000000004) [object to execute our requestListener](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=0&mode=live&start=238.676) [function. Are you connecting the dots now?](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=0&mode=live&start=241.206) [I actually like this version better than](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=0&mode=live&start=243.47449999999992) [using the shorthand notation of](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=0&mode=live&start=245.55328571428572) [createServer. I think it's just more](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=0&mode=live&start=247.13471428571435) [readable. Inside the request handling](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=0&mode=live&start=249.2019090909091) [function here, we can read information](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=0&mode=live&start=250.95281818181823) [about the request using this req object.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=0&mode=live&start=253.2855) [For example, we can read what URL the user](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=0&mode=live&start=256.061) [is requesting, what parameters are they](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=0&mode=live&start=258.7266363636364) [sending along, what IP are they coming](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=0&mode=live&start=260.6083333333334) [from, and many other things. We can write](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=0&mode=live&start=262.86466666666684) [data back to the requester using the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=0&mode=live&start=265.58207692307695) [response object here, which is what we're](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=0&mode=live&start=268.02315384615383) [doing using the. end method. This. end](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=0&mode=live&start=270.7402307692307) [method is equivalent to doing. write, and](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=0&mode=live&start=273.6860769230769) [then doing res. end. It's just a shorthand](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=0&mode=live&start=277.20384615384603) [notation to writing a single line and](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=0&mode=live&start=280.75514285714286) [ending the connection. Since this is an](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=0&mode=live&start=283.45214285714286) [HTTP communication thing, we need to](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=0&mode=live&start=285.81171428571434) [follow the HTTP protocol. That protocol,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=0&mode=live&start=287.61728571428586) [for example, requires an explicit signal](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=0&mode=live&start=289.46440000000007) [that the communication is over. This is](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=0&mode=live&start=291.3946000000002) [exactly why we needed to use the. end](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=0&mode=live&start=293.6463333333333) [method here. This. end method is not](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=0&mode=live&start=296.21966666666657) [optional because without it, the HTTP](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=0&mode=live&start=298.3905) [session will think that we're still](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=0&mode=live&start=300.22349999999994) [streaming data to it. And of course we](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=0&mode=live&start=302.32677777777786) [talked about how the createServer only](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=0&mode=live&start=304.7603333333333) [creates the server method, it does not](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=0&mode=live&start=306.2533333333332) [make it actively listening to requests. To](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=0&mode=live&start=308.37145454545447) [run the server and activate it, we needed](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=0&mode=live&start=310.5331538461538) [to call the. listen method on the server](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=0&mode=live&start=312.2703846153846) [object. This listen method accepts many](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=0&mode=live&start=314.84809090909096) [arguments. The first argument is the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=0&mode=live&start=317.4117272727274) [operating system port on which we want the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=0&mode=live&start=319.054) [server to listen to incoming requests, and](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=0&mode=live&start=320.998) [the last argument, (if you remember, the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=0&mode=live&start=322.80610000000013) [idiomatic callback pattern), this is our](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=0&mode=live&start=325.0738) [callback that will get invoked if the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=0&mode=live&start=327.313) [server reserved the port and started](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=0&mode=live&start=329.70991666666674) [listening on it successfully. This last](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=0&mode=live&start=331.7995) [argument callback can be used as a](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=0&mode=live&start=334.0645) [confirmation that the server is ready.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=0&mode=live&start=336.35939999999994)[That's why in here we're console logging](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=0&mode=live&start=338.103) [the confirmation message. The reason we](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=0&mode=live&start=340.3899000000001) [needed to use that callback for a](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=0&mode=live&start=342.14376923076924) [confirmation here is because the listen](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=0&mode=live&start=343.9492307692308) [method itself here is an asynchronous one.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=0&mode=live&start=346.09069999999997) [Note also that when we ran this file, the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=0&mode=live&start=349.282) [Node process did not exist, because the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=0&mode=live&start=352.1369285714284) [event loop is now also busy listening to](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=0&mode=live&start=354.3553636363636) [incoming connections on port 4242, and it will do that forever.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=0&mode=live&start=356.88481818181805)

[Monitoring Files for Changes](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=1&mode=live)

[Node. js, in development, is a bit](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=1&mode=live&start=1.218) [different than many other runtimes and](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=1&mode=live&start=3.1065) [frameworks. It does not auto-reload any](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=1&mode=live&start=4.725214285714285) [changes. You're going to have to remember](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=1&mode=live&start=6.497500000000002) [to restart it, but let me show you a](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=1&mode=live&start=8.601) [better option. Remember in this same](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=1&mode=live&start=10.842000000000006) [example, when we changed things here and](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=1&mode=live&start=12.788)[saved, we needed to restart Node to see](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=1&mode=live&start=15.322000000000001) [the new changes in the browser? This is](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=1&mode=live&start=17.959538461538468) [not ideal. The popular solution to this](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=1&mode=live&start=20.565571428571428) [problem in Node is to monitor the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=1&mode=live&start=22.860071428571423) [operating system files for saving event,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=1&mode=live&start=25.098833333333335) [and try to auto restart Node when you get](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=1&mode=live&start=26.898333333333344) [these events. There are many npm packages](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=1&mode=live&start=30.225499999999997) [that are designed for this exact purpose.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=1&mode=live&start=33.204) [I usually use nodemon. You just npm i -g](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=1&mode=live&start=35.648) [nodemon, it's probably a good idea to have](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=1&mode=live&start=41.12346153846154)[this package installed globally, but it](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=1&mode=live&start=44.67445454545454) [doesn't really have to be. nce you have](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=1&mode=live&start=46.35063636363634) [access to the nodemon command, you run](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=1&mode=live&start=49.43641666666667) [your code with nodemon instead of node. So](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=1&mode=live&start=52.33122222222222) [nodemon 1-hello-world. js. The nodemon](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=1&mode=live&start=55.87263636363637) [command is a wrapper around the node](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=1&mode=live&start=58.00081818181819) [command, so the nodemon command we just](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=1&mode=live&start=60.69992307692308) [typed will run our server as if we're](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=1&mode=live&start=62.69815384615386) [running it with the node command, but now](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=1&mode=live&start=64.95857142857145) [it will monitor the files for any save](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=1&mode=live&start=67.19571428571433) [events and reload itself when files are](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=1&mode=live&start=70.35042857142861) [saved. So when we change this to "Node"](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=1&mode=live&start=73.37842857142866) [and just hit the save button, nodemon](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=1&mode=live&start=75.8210769230769) [automatically restarted itself, and you'll](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=1&mode=live&start=77.90681818181818) [be able to see the new changes in effect.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=1&mode=live&start=79.7209090909091) [Of course you don't need this nodemon](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=1&mode=live&start=82.96414285714283) [package in production. This is just a development convenience.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=1&mode=live&start=85.4651428571428)

[The “req” and “res” Objects](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=2&mode=live)

[The requestListener function receives](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=2&mode=live&start=0) [these 2 arguments. Let's talk about them a](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=2&mode=live&start=2.922727272727273) [bit more. How to use them. What](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=2&mode=live&start=5.504545454545454) [information and capabilities do they](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=2&mode=live&start=7.668181818181819) [provide? How to know what to do with them.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=2&mode=live&start=9.186363636363634) [The easiest way to explore them is to log](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=2&mode=live&start=12.101199999999997) [them. For example, let's console. log the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=2&mode=live&start=15.476166666666668) [req object here. Now to get this line to](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=2&mode=live&start=19.291750000000008) [execute, we don't need to restart Node,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=2&mode=live&start=22.421923076923072) [thanks to nodemon, but we need to go make](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=2&mode=live&start=24.166) [an HTTP request, because this is the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=2&mode=live&start=26.772249999999996) [function that gets executed per HTTP](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=2&mode=live&start=29.26936363636363) [request. When we do a request, you'll see](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=2&mode=live&start=31.711909090909074) [this big object here in the logs. This is](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=2&mode=live&start=34.59799999999998) [the request object and this is everything](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=2&mode=live&start=37.64014285714285) [you can do on it. It has a lot of](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=2&mode=live&start=39.61114285714282) [properties and the printing here is also](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=2&mode=live&start=42.13284615384615)[printing everything nested under the main](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=2&mode=live&start=43.69223076923077) [properties of the request object, which is](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=2&mode=live&start=45.89950000000001) [a bit hard to read. To get a smaller](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=2&mode=live&start=48.349428571428575) [output about this request object, use dir](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=2&mode=live&start=50.44385714285716) [instead of log, and pass in, as a second](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=2&mode=live&start=52.6416923076923) [argument to it, the object with a property](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=2&mode=live&start=56.016) [depth equal to 0. This means do not print](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=2&mode=live&start=60.163333333333334) [any nested objects. Only print the first](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=2&mode=live&start=63.766375000000004) [level of properties for this req object.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=2&mode=live&start=66.196) [Node has restarted. Refresh to see the new](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=2&mode=live&start=68.842) [output, and now, we see only the first](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=2&mode=live&start=72.04927272727276) [level of properties and any nested objects](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=2&mode=live&start=75.15046153846154) [will not be printed here. Note a couple of](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=2&mode=live&start=77.80830769230771) [things about this output here. The request](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=2&mode=live&start=81.17692307692313) [object is of type IncomingMessage. It's](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=2&mode=live&start=84.11071428571428) [the class that was used to internally](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=2&mode=live&start=87.17025000000001) [instantiate a request object. This is good](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=2&mode=live&start=89.93700000000004) [to know because if you want to find the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=2&mode=live&start=92.20246153846153) [documentation about what you can do with](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=2&mode=live&start=94.25584615384614) [the request object, you need to go the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=2&mode=live&start=96.0855714285714)[IncomingMessage class under the HTTP](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=2&mode=live&start=98.221) [documentation. So that little request](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=2&mode=live&start=101.34850000000002) [object here belongs to the IncomingMessage](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=2&mode=live&start=103.534) [class. All the properties and events you](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=2&mode=live&start=105.87400000000001) [find in this documentation section applies](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=2&mode=live&start=108.33127272727272) [to the request object. Because the popular](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=2&mode=live&start=110.39781818181818) [name of this incoming message object is](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=2&mode=live&start=112.80454545454543) ["request", one might confuse it with this](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=2&mode=live&start=115.7698181818182) [ClientRequest class. This ClientRequest](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=2&mode=live&start=119.154) [class is used when you want to use the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=2&mode=live&start=121.22159999999997)[http library as an agent to fetch](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=2&mode=live&start=125.36271428571428) [information from an http server, rather](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=2&mode=live&start=127.78871428571424) [than as a server, which is what our](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=2&mode=live&start=129.765) [example is doing. So remember, the request](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=2&mode=live&start=132.1249999999999) [object within an HTTP server listener](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=2&mode=live&start=134.24479999999994) [function is of type IncomingMessage. The](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=2&mode=live&start=136.097) [other important thing to notice here is](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=2&mode=live&start=140.0468) [that the console. dir line was executed](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=2&mode=live&start=144.66790909090906) [twice. We have 2 request objects here,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=2&mode=live&start=149.30636363636353) [which means for a single HTTP request](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=2&mode=live&start=151.98269230769228) [coming from my Chrome browser, the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=2&mode=live&start=154.332) [listener function is executed twice, not](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=2&mode=live&start=156.77280000000002) [once. If you want to investigate this a](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=2&mode=live&start=159.0815) [little bit further, and you should, drill](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=2&mode=live&start=161.80750000000012) [down for more clues. For example, look at](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=2&mode=live&start=164.25677777777773) [the request property values here. In](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=2&mode=live&start=166.99988888888885) [particular, the url property. So instead](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=2&mode=live&start=169.06009090909092) [of console. dir request here, let's just](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=2&mode=live&start=171.4546363636364) [log req. url and see what that will](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=2&mode=live&start=174.47424999999996) [output. So server restarted, refresh this](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=2&mode=live&start=178.2695833333332) [guy, and take a look at the two URLs we're](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=2&mode=live&start=180.4761428571428) [getting here. The root request, and the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=2&mode=live&start=183.99714285714285) [other is for a favicon request. My Chrome](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=2&mode=live&start=186.81914285714282) [is automatically trying to ask the server](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=2&mode=live&start=189.9142857142857) [if it has a favicon. This url is a](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=2&mode=live&start=192.2812857142857)[property on the req object and it's](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=2&mode=live&start=195.26061538461536) [actually the property that Web frameworks](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=2&mode=live&start=197.51569230769223) [use to implement their routing features.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=2&mode=live&start=199.98839999999998) [We'll talk about web frameworks in the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=2&mode=live&start=202.731) [next video. Let me now console. dir the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=2&mode=live&start=205.1981111111111) [response object and take a look at that.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=2&mode=live&start=207.75400000000005) [Refresh the browser. And the response](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=2&mode=live&start=210.222) [object is of type ServerResponse if you](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=2&mode=live&start=212.59080000000003) [need to look it up in the documentation.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=2&mode=live&start=215.22627272727274) [We can use this response object to send a](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=2&mode=live&start=218.043) [few things over to the requester. It can](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=2&mode=live&start=220.70940000000002) [control things like the status code and](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=2&mode=live&start=222.96783333333335) [the status message, the headers of the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=2&mode=live&start=224.65075000000007) [response, and any data we'd like to](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=2&mode=live&start=226.502) [include in the response body, which is](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=2&mode=live&start=228.4795) [what our example is doing here. Both the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=2&mode=live&start=230.69539999999995) [request and response object are streams](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=2&mode=live&start=233.87733333333335) [here. The request object is a readable](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=2&mode=live&start=237.26533333333344) [stream, while the response object is a](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=2&mode=live&start=239.31199999999993) [writeable one. Because streams are all](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=2&mode=live&start=241.2732) [event emitters, we can subscribe to events](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=2&mode=live&start=243.45180000000002) [emitted by these objects too. We can also](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=2&mode=live&start=245.61300000000003) [use them with other streams, which is a](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=2&mode=live&start=247.67692857142856) [really good thing for you to learn right](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=2&mode=live&start=249.3540714285714) [after this course. I cover it in details](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=2&mode=live&start=251.0301428571428) [in the advanced node course at Pluralsight.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=2&mode=live&start=252.7055714285713)

[Node Web Frameworks](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=3&mode=live)

[While Node comes with a built-in module to](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=3&mode=live&start=1.261) [work with HTTP and HTTPS, and even HTTP/2,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=3&mode=live&start=4.000076923076922) [these modules are low-level and they offer](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=3&mode=live&start=7.23175)[limited capabilities. For example, there](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=3&mode=live&start=10.777833333333334) [is no API to read body parameters from a](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=3&mode=live&start=12.700692307692307) [POST request, you have to manually parse](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=3&mode=live&start=15.429769230769228) [the text, which you can do using other](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=3&mode=live&start=17.32761538461538) [Node built-in modules, but because of this](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=3&mode=live&start=19.453307692307693) [fact, a number of web frameworks have](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=3&mode=live&start=21.31046153846155) [surfaced in the Node ecosystem to provide](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=3&mode=live&start=23.353545454545454) [a richer interface to create and work with](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=3&mode=live&start=25.861454545454542) [web servers. These frameworks usually wrap](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=3&mode=live&start=28.73875) [the underlying built-in power in Node and](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=3&mode=live&start=30.8922) [give you a simpler API to create more](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=3&mode=live&start=33.4628) [complicated features in your web servers.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=3&mode=live&start=36.8292) [The most popular of these options is the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=3&mode=live&start=39.354)[Express JS framework. So let's create an](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=3&mode=live&start=42.37290909090912) [express-based web server example, and](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=3&mode=live&start=45.38) [let's do it here under the 2-express](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=3&mode=live&start=47.64369230769231) [folder, inside the 5-web directory. I have](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=3&mode=live&start=50.36453846153848) [an index. js already there which is the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=3&mode=live&start=52.947875) [starting template of an express server.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=3&mode=live&start=55.50737500000002) [But the first thing that you need to do](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=3&mode=live&start=57.427)[really is to bring express here as a](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=3&mode=live&start=59.525928571428544) [dependency, and for that we need to use](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=3&mode=live&start=61.617615384615384) [npm install. And to use npm install you](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=3&mode=live&start=64.08592307692308) [should have a package. json. So the first](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=3&mode=live&start=66.09336363636362) [step is to create a package. json, we can](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=3&mode=live&start=67.984) [use the "npm init" command here, and I'm](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=3&mode=live&start=70.17999999999999) [just going to do --yes to get the defaults](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=3&mode=live&start=72.38700000000003) [of npm init, and this command will create](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=3&mode=live&start=75.0826) [a package. json file for us. Here is](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=3&mode=live&start=78.31139999999998) [package. json here. Once we have package.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=3&mode=live&start=81.38216666666668) [json like that, we bring in the express](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=3&mode=live&start=83.65425000000003) [dependency using npm install express. This](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=3&mode=live&start=86.95550000000003) [will download express, place it under the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=3&mode=live&start=89.6269) [node\_modules folder, and as you can see,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=3&mode=live&start=92.03420000000004) [it documented that we started depending on](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=3&mode=live&start=94.04430769230765) [express for this project. If you look](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=3&mode=live&start=95.89553846153838) [under the node\_modules folder now, you'll](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=3&mode=live&start=98.90527272727272) [see a lot more dependencies than express,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=3&mode=live&start=101.41766666666666) [express is one of these guys, but just](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=3&mode=live&start=102.99033333333331) [keep in mind, that all of these packages](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=3&mode=live&start=104.7892857142857) [are now part of your project dependencies.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=3&mode=live&start=106.5898571428571) [To use express, we require express using](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=3&mode=live&start=109.56454545454548) [the require function. The express package](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=3&mode=live&start=113.08789999999999) [exports its top-level API as a function.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=3&mode=live&start=116.05129999999997) [So when captured the returned API into a](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=3&mode=live&start=119.19084615384615) [local variable here, which is usually](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=3&mode=live&start=122.50653846153845) [named express as well, that express](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=3&mode=live&start=124.98155555555559)[variable in our script is now a function.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=3&mode=live&start=127.3296) [And this is why, to create an express](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=3&mode=live&start=130.128) [server, we just call this function. The](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=3&mode=live&start=133.15657142857145) [result of calling this express function is](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=3&mode=live&start=135.76536363636365) [an object that's usually named server (or](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=3&mode=live&start=138.12690909090918) [you'll see it named as "app" in some](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=3&mode=live&start=140.3737692307692) [examples). Now to make this server object](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=3&mode=live&start=142.84330769230758) [listen to incoming requests from users of](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=3&mode=live&start=144.84449999999998) [this web server, we call the. listen](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=3&mode=live&start=146.80657142857143) [method on it, which is very similar to the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=3&mode=live&start=148.6935714285714) [method we used to create a web server](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=3&mode=live&start=151.00930769230771) [using the built-in http module in Node. It](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=3&mode=live&start=152.8714615384616) [takes a callback that gets invoked when](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=3&mode=live&start=155.053) [the listen operation is done. Now here's](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=3&mode=live&start=157.1096923076923) [where express is a bit different than the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=3&mode=live&start=159.49453846153847) [built-in module. We don't define a single](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=3&mode=live&start=162.48024999999998) [request listener. We define many](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=3&mode=live&start=165.4721666666666) [listeners. We actually define a listener](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=3&mode=live&start=167.87609090909095) [per URL. For every URL and HTTP operation](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=3&mode=live&start=170.97427272727285) [that we want our server to support, we](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=3&mode=live&start=174.17946153846157) [define a listener. For example, usually](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=3&mode=live&start=176.98808333333332) [the first URL that you want to support is](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=3&mode=live&start=178.63258333333326) [the root URL. We use the following syntax](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=3&mode=live&start=181.07980000000003) [to do that. We do server. get, specify the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=3&mode=live&start=183.23340000000013) [URL in the first argument for this get](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=3&mode=live&start=186.47220000000004) [function. So, slash here as a string, and](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=3&mode=live&start=189.7138000000001) [the second argument is the listener](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=3&mode=live&start=192.50761538461543) [function that receives both the request](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=3&mode=live&start=194.555) [and response object. So I just inlined it](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=3&mode=live&start=197.22899999999993) [here, and this guy receives request and](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=3&mode=live&start=200.34638461538464) [response. Inside the listener function,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=3&mode=live&start=202.83892307692312)[these request and response objects are](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=3&mode=live&start=204.62500000000006) [also a bit different. For example, instead](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=3&mode=live&start=206.77) [of using the. write method on the response](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=3&mode=live&start=209.51145454545457) [object, we can use. send method. You can](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=3&mode=live&start=213.02040000000002) [use the. send method to send anything to](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=3&mode=live&start=216.5505) [the requester, not just a string. You can,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=3&mode=live&start=219.0164999999999) [for example, send an object if you need](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=3&mode=live&start=221.06780000000006) [to. And with. send, you don't need to](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=3&mode=live&start=222.9808666666668) [invoke the. end method, express will do](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=3&mode=live&start=225.34990909090902) [that automatically. Let me just send a](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=3&mode=live&start=227.52375) [string here, "Hello Express", and let's](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=3&mode=live&start=229.75616666666667) [run this code with nodemon. Remember,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=3&mode=live&start=232.36466666666672) [nodemon index. js here should run our](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=3&mode=live&start=235.3242) [express server. So with this simple code,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=3&mode=live&start=238.7975999999999) [the server will start accepting](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=3&mode=live&start=241.38136363636363) [connections and requests, and if the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=3&mode=live&start=242.97272727272727) [request matches one of the defined URLs,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=3&mode=live&start=245.16224999999994) [the listener for that URL will be invoked.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=3&mode=live&start=247.782) [So when we go to the root endpoint in a](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=3&mode=live&start=250.464) [browser, using the port we passed in the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=3&mode=live&start=252.51266666666675) [listen function, you'll get the string we](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=3&mode=live&start=254.42640000000003) [defined in the. send method. However, if](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=3&mode=live&start=256.5016666666667) [we go to a different endpoint, say /about,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=3&mode=live&start=258.9303333333333) [for example, instead of /, the server will](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=3&mode=live&start=262.71566666666655) [not have a listener for that. You're just](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=3&mode=live&start=266.23550000000006) [getting a 404 here. To define a listener](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=3&mode=live&start=269.47853846153845) [for the /about, we just add one more get](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=3&mode=live&start=272.15669230769214) [method here, and define it for /about](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=3&mode=live&start=275.5438571428571) [instead of /, and let's respond with a](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=3&mode=live&start=278.3238571428571) [different message here. Nodemon](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=3&mode=live&start=281.3256999999999) [automatically restarted Node, so let's](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=3&mode=live&start=282.93844444444443) [test both endpoints, the /about is going](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=3&mode=live&start=285.42066666666653) [to respond with its message, and the / is](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=3&mode=live&start=288.18119999999993) [going to continue to respond with the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=3&mode=live&start=291.0413999999997) [original message. So as you can see,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=3&mode=live&start=293.6777142857142) [express provides a more pleasant syntax to](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=3&mode=live&start=295.9042500000001) [implement more advanced features in our](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=3&mode=live&start=297.901) [web servers. Without express, we would](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=3&mode=live&start=300.1525)[have to do custom logic to implement the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=3&mode=live&start=302.00199999999995) [same capabilities using just the native](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=3&mode=live&start=304.2) [HTTP module. And of course there are other](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=3&mode=live&start=307.04925) [frameworks that you can use besides](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=3&mode=live&start=309.8710000000001) [express. I'll mention three of them here.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=3&mode=live&start=311.74300000000017) [There is Koa. js, which focuses on more](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=3&mode=live&start=313.6440769230771) [modern of the JavaScript language and the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=3&mode=live&start=315.9433) [Node runtime. There is Sails. js which is](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=3&mode=live&start=319.06039999999985) [inspired by Rails really. So a more](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=3&mode=live&start=322.57000000000016) [featured web framework that provides](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=3&mode=live&start=325.47345454545456)[working with modules, and auto-generated](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=3&mode=live&start=327.40254545454553) [APIs, and many other cool features. And](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=3&mode=live&start=329.57975000000005) [then there is Meteor, which offers a more](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=3&mode=live&start=333.0225384615385) [integrated way to build web applications](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=3&mode=live&start=336.0908461538463) [in general. And these are just some of the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=3&mode=live&start=338.3175) [popular options, there are actually](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=3&mode=live&start=341.43375) [hundreds of other options that you can use](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=3&mode=live&start=343.0339999999999) [to build web servers with Node. js, and](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=3&mode=live&start=345.542) [you get to pick the best one based on what you need.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=3&mode=live&start=347.90733333333316)

[Using Template Languages](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=4&mode=live)

[One of the most popular needs when working](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=4&mode=live&start=0.796) [with Web Servers is to work with a](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=4&mode=live&start=2.618857142857143) [template language to deliver static HTML](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=4&mode=live&start=4.795090909090909) [that's generated based on some data.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=4&mode=live&start=7.222363636363635) [Without a templating language, you would](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=4&mode=live&start=9.345923076923077) [need to do a lot of string concatenation](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=4&mode=live&start=11.16576923076923) [to accomplish that task. There are a few](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=4&mode=live&start=14.195000000000002) [great options when it comes to template](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=4&mode=live&start=16.86792307692308) [languages with Node, and most of these](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=4&mode=live&start=18.367538461538473) [options work with the big Web frameworks](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=4&mode=live&start=20.19407692307693) [like Koa and Express. The most popular](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=4&mode=live&start=22.151384615384636) [templating language in Node is probably](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=4&mode=live&start=25.366799999999998) [pug, which used to be named Jade. This is](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=4&mode=live&start=27.884399999999992) [a simple language implementing the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=4&mode=live&start=31.052666666666678) [offside-rule, which means that the HTML](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=4&mode=live&start=32.89075) [nesting is based on indentation. I am not](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=4&mode=live&start=35.67324999999998) [really a fan of the offside rule, but if](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=4&mode=live&start=38.590399999999995) [it's something you like, check out pug. My](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=4&mode=live&start=40.38559999999999) [favorite templating language in Node. js](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=4&mode=live&start=43.712777777777774) [is Handlebars. This is the same language](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=4&mode=live&start=46.18944444444443) [that the Ember framework uses and I find](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=4&mode=live&start=48.48142857142858) [it to be simple and feature-rich. But the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=4&mode=live&start=50.82771428571431) [simplest templating language that you can](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=4&mode=live&start=54.25683333333333) [use is probably EJS, for Embedded](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=4&mode=live&start=56.338333333333324) [JavaScript. You get a template language to](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=4&mode=live&start=58.393818181818176) [write HTML views, and you can embed](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=4&mode=live&start=60.731181818181796) [JavaScript while doing so. I prepared an](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=4&mode=live&start=64.03344444444446) [example for you to see how EJS can be used](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=4&mode=live&start=66.91340000000002) [with Express here under the 3-ejs folder.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=4&mode=live&start=69.48806666666675) [Look at the package. json, you'll see that](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=4&mode=live&start=72.4175) [we have the two dependencies now, express](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=4&mode=live&start=75.8455) [and ejs, and to bring these dependencies,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=4&mode=live&start=78.21033333333335) [you need to run the npm install command](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=4&mode=live&start=80.18224999999997)[without any arguments, just like that. Now](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=4&mode=live&start=82.466) [look at index. js, this is the same](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=4&mode=live&start=85.58192857142858) [example that we've seen without ejs, and](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=4&mode=live&start=87.99735714285718) [here are the differences. We instruct](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=4&mode=live&start=90.29533333333333) [express to set the view engine to ejs,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=4&mode=live&start=92.66033333333331) [this is the only line really that's needed](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=4&mode=live&start=95.55423076923077) [for configuring express to work with ejs,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=4&mode=live&start=98.18869230769232) [you set the view engine to ejs. And then,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=4&mode=live&start=101.09292307692311) [inside of the request listeners, instead](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=4&mode=live&start=104.92536363636363) [of. send here, I am using. render index.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=4&mode=live&start=107.41045454545453) [This means, render one of the templates,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=4&mode=live&start=110.63758333333335) [which express finds by default under the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=4&mode=live&start=113.416) [views directory, inside this folder. So if](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=4&mode=live&start=116.3404444444444) [you look at the views directory, you'll](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=4&mode=live&start=118.78509090909094) [notice that I have an index. ejs and an](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=4&mode=live&start=121.03073333333333) [about. ejs and these are two templates](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=4&mode=live&start=123.86333333333336) [that are being used to render HTML to the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=4&mode=live&start=126.12330769230768)[requester when they go to / and /about. So](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=4&mode=live&start=129.2116923076923) [the index. ejs has a "Hello EJS" h2](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=4&mode=live&start=132.3442666666667) [element, and the about. ejs has an "About"](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=4&mode=live&start=135.14) [h2 element. And if you run the server, and](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=4&mode=live&start=139.26480000000004) [after that go to the port that we just](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=4&mode=live&start=142.7822142857143) [used, you'll see the index. ejs template,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=4&mode=live&start=144.51214285714275) [and if you go to /about, you'll see the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=4&mode=live&start=146.64540000000002) [about. ejs template. And this is all HTML](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=4&mode=live&start=150.73860000000008) [that's coming from the templating](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=4&mode=live&start=153.72027272727277) [language. And because it's all embedded](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=4&mode=live&start=155.33754545454553) [JavaScript, you can embed JavaScript.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=4&mode=live&start=157.52900000000005) [Let's put a div here, and inside the div,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=4&mode=live&start=159.397) [I'm going to embed some JavaScript. You](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=4&mode=live&start=161.8816000000001) [use this kind of weird syntax here, and](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=4&mode=live&start=163.93541666666667) [inside of that, you can put any JavaScript](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=4&mode=live&start=167.11474999999993) [expression. So I'll do Math. random(), for](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=4&mode=live&start=170.27154545454542) [example, and this will give me a random](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=4&mode=live&start=172.86285714285714) [value when I refresh the template for ejs.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=4&mode=live&start=174.7337142857143) [There you go, embedded JavaScript](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=4&mode=live&start=177.83830000000003) [templating language. Very powerful. Now](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=4&mode=live&start=181.0638000000001) [this syntax here is specific to ejs, other](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=4&mode=live&start=183.79010000000002) [languages will have different syntax for](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=4&mode=live&start=187.54866666666666) [embedding JavaScript. If you follow my](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=4&mode=live&start=189.9946666666667) [online courses, you know that I am a big](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=4&mode=live&start=191.70125000000002) [fan of the React front-end library. And](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=4&mode=live&start=193.70656250000005) [the React library uses the JSX extension.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=4&mode=live&start=196.47463636363636) [So React with JSX can be used as another](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=4&mode=live&start=200.149) [templating option when it comes to working](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=4&mode=live&start=203.33361538461534) [with Node on the backend. And today this](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=4&mode=live&start=205.54076923076923) [is actually what I use when I need](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=4&mode=live&start=207.65215384615385) [templating on the server. I use React](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=4&mode=live&start=210.02799999999996) [itself and JSX on the server, not just on](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=4&mode=live&start=212.25257142857146) [the front-end. If you want to check out](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=4&mode=live&start=215.23028571428586) [the React. js library, we have the React. js Getting Started course on Pluralsight.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=4&mode=live&start=217.38240000000002)

[Wrap Up](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=5&mode=live)

[Node was originally designed to help](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=5&mode=live&start=1.268) [developers create web servers and then it](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=5&mode=live&start=4.014363636363638) [was modified to be a more generic runtime](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=5&mode=live&start=6.976) [for JavaScript. When it comes to working](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=5&mode=live&start=9.667999999999996) [with web servers in Node, you have](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=5&mode=live&start=11.962153846153848) [options. Lots of them. We've seen how to](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=5&mode=live&start=14.231769230769237) [work with the native built-in http module](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=5&mode=live&start=16.887) [itself that comes with Node. We learned](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=5&mode=live&start=19.144384615384617) [how to use tools like nodemon to](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=5&mode=live&start=20.960076923076922) [automatically reload Node in development.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=5&mode=live&start=23.37814285714286) [We talked about the request and response](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=5&mode=live&start=26.181) [objects within request listeners, and we](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=5&mode=live&start=28.605799999999995) [explored the express framework and saw how](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=5&mode=live&start=30.684363636363635) [it enables us to write more featured web](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=5&mode=live&start=33.10954545454546) [servers using shorter and easier to](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=5&mode=live&start=35.85933333333334) [maintain code. We've also looked at an](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=5&mode=live&start=38.0858) [example that uses the EJS templating](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=5&mode=live&start=41.65439999999999)[language. In the next module, we'll](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=5&mode=live&start=44.71319999999998) [explore three other built-in Node modules](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=5&mode=live&start=47.02209090909092) [that we can use to work with the Operating System.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=fd18834b-1b15-44aa-999a-07f7177e7e59&clip=5&mode=live&start=49.181)

[Working with the Operating System](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=0&mode=live)

[Introduction](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=0&mode=live)

[One of the common tasks in any backend](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=0&mode=live&start=0) [program is to work with the operation](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=0&mode=live&start=2.4731428571428573) [system resources. Read information from](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=0&mode=live&start=4.7511) [the OS and write information to it as](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=0&mode=live&start=6.866599999999999) [well. Node has a few built-in modules that](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=0&mode=live&start=10.001) [provide some core features around these](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=0&mode=live&start=12.885) [tasks. There is the OS module for general](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=0&mode=live&start=15.278142857142855) [communication with the OS, and the FS](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=0&mode=live&start=18.20972727272728) [module, which is specific to reading and](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=0&mode=live&start=20.530187499999997) [writing to the OS file system. And there](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=0&mode=live&start=22.56762499999999) [is also the child\_processes module that](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=0&mode=live&start=24.92133333333333) [enables you to run any operating system](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=0&mode=live&start=26.743333333333318) [command from within Node. Let's talk about all these three handy modules.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=0&mode=live&start=29.334999999999997)

[The os Module](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=1&mode=live)

[The os module is a simple one. It provides](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=1&mode=live&start=1.101) [a number of operating system-related](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=1&mode=live&start=3.4638461538461534) [utility methods. I wrote a few examples of](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=1&mode=live&start=5.535666666666667) [these methods here under the 6-os folder](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=1&mode=live&start=9.969249999999999) [1-os. js file. To use the os module, you](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=1&mode=live&start=12.757874999999997) [require it first like this. Then the os](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=1&mode=live&start=16.138090909090906) [variable will have a few methods you can](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=1&mode=live&start=18.638249999999996) [call, for example, you can read what the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=1&mode=live&start=20.44958333333332) [operating system platform as set during](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=1&mode=live&start=22.592833333333324) [the compiling of Node using this platform](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=1&mode=live&start=24.445666666666668) [method. You can also read the architecture](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=1&mode=live&start=27.831333333333344) [of this OS CPU. Is it 32, 64, arm, or](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=1&mode=live&start=29.883999999999993) [something else? You can read information](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=1&mode=live&start=33.13615384615385) [about each logical CPU core with this cpus](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=1&mode=live&start=35.342307692307706) [method. I am just counting them here. You](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=1&mode=live&start=38.73137499999998) [can read information about the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=1&mode=live&start=41.650333333333336) [environment, like where is the current](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=1&mode=live&start=43.427) [user home directory, and you can do](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=1&mode=live&start=45.54766666666665) [operating system agnostic operations,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=1&mode=live&start=47.9431111111111) [like, for example, creating a multiline](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=1&mode=live&start=49.278222222222205) [string using the end of line character.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=1&mode=live&start=51.54283333333334) [Although this is really less important](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=1&mode=live&start=54.246) [today because JavaScript itself has](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=1&mode=live&start=56.08979999999999) [template strings that can have multiple](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=1&mode=live&start=57.724000000000004) [lines. There are a few other handy methods](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=1&mode=live&start=60.15400000000001) [for this os module that are all](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=1&mode=live&start=62.30099999999998) [well-documented under the OS module documentation page.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=1&mode=live&start=64.043)

[The fs Module](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=2&mode=live)

[The fs module provides a big API for](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=2&mode=live&start=1.214) [interacting with the file system. We've](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=2&mode=live&start=3.883538461538462) [seen a few of its methods already. You've](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=2&mode=live&start=5.769333333333333) [seen the basic readFile and writeFile](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=2&mode=live&start=7.508) [methods, but there are so many other](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=2&mode=live&start=9.092181818181816) [methods under this module. This is](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=2&mode=live&start=11.267272727272719) [probably the biggest API among all the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=2&mode=live&start=13.329250000000004)[built-in Node. js modules. Using the fs](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=2&mode=live&start=15.781) [module, not only you can read and write](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=2&mode=live&start=18.41192307692308) [files as buffers, you can also work files](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=2&mode=live&start=21.343000000000004) [as streams, which is a lot more efficient](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=2&mode=live&start=24.04700000000001) [when working with big files. You can also](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=2&mode=live&start=26.21863636363637) [work with directories and do many](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=2&mode=live&start=28.292500000000004) [operations on both directories and files.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=2&mode=live&start=29.947500000000012)[Let me show you a few examples of things](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=2&mode=live&start=31.464307692307695) [you can do using the fs module. I am using](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=2&mode=live&start=33.532230769230765) [the promise-based API for these examples.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=2&mode=live&start=37.45966666666667) [You can also use the original callback API](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=2&mode=live&start=39.339) [for them, and most of the API methods here](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=2&mode=live&start=41.437285714285736) [have synchronous versions that you can use](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=2&mode=live&start=44.1005) [as well. To use all of these promise-based](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=2&mode=live&start=46.64266666666665) [methods, you just await on them within a](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=2&mode=live&start=49.20350000000002) [function labeled async. Most of these](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=2&mode=live&start=51.7056923076923) [methods are based on a filePath and some](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=2&mode=live&start=53.70876923076922) [of them take an optional configuration](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=2&mode=live&start=56.58819999999999) [object. These square brackets here](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=2&mode=live&start=59.00859999999998) [indicate that this options object is](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=2&mode=live&start=61.42872727272728) [optional. If you do want to read and write](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=2&mode=live&start=64.45381818181819) [files, I recommend looking into the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=2&mode=live&start=66.94371428571426) [createReadStream and createWriteStream](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=2&mode=live&start=68.433) [methods. These are so much better than](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=2&mode=live&start=71.0295) [readFile and writeFile, because the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=2&mode=live&start=73.66766666666665) [regular readFile and writeFile use buffers](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=2&mode=live&start=75.19800000000001) [to work and will use a lot more memory](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=2&mode=live&start=77.13000000000002) [than the streaming-based ones. Using the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=2&mode=live&start=80.4204) [fs module you can append data to a file,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=2&mode=live&start=82.50399999999999) [this will also create the file if it does](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=2&mode=live&start=84.90699999999995) [not exist. You can copy files, and if you](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=2&mode=live&start=87.26240000000001) [attempt to copy a file to a destination](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=2&mode=live&start=89.594) [that already exists, it'll be overwritten.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=2&mode=live&start=92.11618181818181) [You can read information about files using](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=2&mode=live&start=94.11084615384617) [the stat method. Using this method, you](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=2&mode=live&start=96.5581538461539) [can get data about the file, like its](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=2&mode=live&start=98.77161538461539) [size, for example, without needing to read](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=2&mode=live&start=101.10084615384616) [the whole contents of the file, which is](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=2&mode=live&start=103.32499999999996) [nice. This method will also include](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=2&mode=live&start=105.962) [time-related data about the file, like](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=2&mode=live&start=108.07400000000003) [when was it created and when was it last](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=2&mode=live&start=110.16153846153847) [modified. You can read user's permissions](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=2&mode=live&start=113.2561538461539) [for files and directories using the access](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=2&mode=live&start=115.24045454545451) [method and you can change the permissions](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=2&mode=live&start=117.51384615384616) [and even the owner of a file with the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=2&mode=live&start=119.64776923076926) [chmod and chown methods. You can link and](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=2&mode=live&start=122.80615384615382) [unlink files and you can even truncate a](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=2&mode=live&start=126.07446153846146) [file's content if you need to. You can](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=2&mode=live&start=128.9168461538462) [make new directories, read a directory](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=2&mode=live&start=131.75754545454544) [list of files, remove a directory, and](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=2&mode=live&start=134.0211818181818) [rename directories and files as well. This](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=2&mode=live&start=136.643) [is a very powerful module even if you do](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=2&mode=live&start=139.1309375) [not use Node as the host of your backend](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=2&mode=live&start=141.407375) [servers. For example, I recently used the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=2&mode=live&start=143.93349999999998) [fs module to generate test files for a](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=2&mode=live&start=146.28666666666658) [project that had hundreds of UI](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=2&mode=live&start=149.32992307692308) [components. It took me about 10 minutes to](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=2&mode=live&start=151.70084615384616) [do that using the powerful methods you can see here for the fs module.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=2&mode=live&start=153.64149999999998)

[The child\_process Module](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=3&mode=live)

[The child process module provides four](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=3&mode=live&start=1.127) [main methods that allow you to execute any](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=3&mode=live&start=3.1075000000000004) [operating system command from within a](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=3&mode=live&start=5.846363636363637) [Node process using a sub process and then](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=3&mode=live&start=8.121454545454545) [get the result of running that command in](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=3&mode=live&start=10.88275) [your main process. The sky's the limit](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=3&mode=live&start=13.480749999999999) [here. Anything you can do in your](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=3&mode=live&start=15.537666666666668) [operating system shell can be done from](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=3&mode=live&start=17.432333333333336) [within Node. The four main methods are](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=3&mode=live&start=20.12549999999999) [spawn, exec, execFile, and fork. Fork is a](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=3&mode=live&start=23.308000000000007)[special one to create sub processes that](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=3&mode=live&start=26.597571428571424) [run node itself again. This is the concept](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=3&mode=live&start=28.731571428571414) [the powers the cluster concept in Node.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=3&mode=live&start=31.20554545454545) [The other three can be used to execute](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=3&mode=live&start=33.401) [regular OS commands like ls or pwd, for](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=3&mode=live&start=35.98099999999999) [example. These have a few pros and cons](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=3&mode=live&start=38.523333333333326) [here, but I am going to save you some](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=3&mode=live&start=40.952666666666644) [research here and tell you that you should](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=3&mode=live&start=44.280750000000005) [use the spawn method. Here are a few](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=3&mode=live&start=47.90025000000002) [examples of things you can do with spawn.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=3&mode=live&start=50.77866666666667) [You destructure the spawn method out of](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=3&mode=live&start=52.916) [the require call to child\_processes. Then](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=3&mode=live&start=55.44825) [you call the spawn with a string](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=3&mode=live&start=57.61790909090909) [representing the command, pwd here, for](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=3&mode=live&start=60.144272727272714) [example. Once you get the result of that,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=3&mode=live&start=62.10407142857142) [you can use the pipe method to send its](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=3&mode=live&start=64.44292857142857) [output to the process stdout, which will](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=3&mode=live&start=67.54272727272729)[print the spawned process output. In this](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=3&mode=live&start=70.18271428571428) [second example, I am reading the content](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=3&mode=live&start=72.62985714285715) [of a file under my home directory using](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=3&mode=live&start=74.30235714285716) [the cat command. If you need to pass the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=3&mode=live&start=76.53892307692308) [command arguments, you can use the second](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=3&mode=live&start=79.66469230769233) [argument of spawn, which is an array of](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=3&mode=live&start=82.01507692307692) [all the arguments you wish to pass to the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=3&mode=live&start=84.65725) [spawned process. Here's an example sending](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=3&mode=live&start=87.40450000000001) [two arguments. This will list all the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=3&mode=live&start=89.29800000000002) [files in the current directory. And](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=3&mode=live&start=91.54325000000004) [finally, if you need to use shell syntax](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=3&mode=live&start=93.29983333333332) [in your spawned process, you can pass in a](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=3&mode=live&start=95.63491666666667) [configuration object with shell set to](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=3&mode=live&start=98.55916666666667) [true here, and with that, you can get all](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=3&mode=live&start=100.27753333333334) [the power of the shell. I am using the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=3&mode=live&start=102.68173333333334) [tilde here and the pipe operator, and](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=3&mode=live&start=105.20615384615384) [passing arguments to commands directly.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=3&mode=live&start=107.33816666666667) [This is a powerful option, but it's also a](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=3&mode=live&start=109.469) [dangerous one, especially if you do not](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=3&mode=live&start=112.42509090909093) [trust the source of where this string is](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=3&mode=live&start=114.73999999999997)[coming from. So only use this shell option](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=3&mode=live&start=117.39279999999992) [if you need to and if you have control over, or trust the source of the commands.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=3&mode=live&start=119.52679999999997)

[Debugging Node Applications](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=4&mode=live)

[Before we wrap up this course, I'd like to](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=4&mode=live&start=1.256) [show you one handy trick about debugging](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=4&mode=live&start=3.426285714285714) [Node applications because I know you're](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=4&mode=live&start=5.2620000000000005) [going to run into problems. Node comes](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=4&mode=live&start=7.152000000000003) [with a built-in debugging client, but that](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=4&mode=live&start=9.478166666666667) [one is limited. The cool thing about](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=4&mode=live&start=12.107249999999999) [Node's debugger is that it's beautifully](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=4&mode=live&start=14.533999999999999) [integrated with Chrome Dev Tools! If](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=4&mode=live&start=16.484) [you're familiar with these, you know how](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=4&mode=live&start=19.154600000000002) [powerful they are. All that power is](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=4&mode=live&start=21.97253846153846) [available to you when working with Node as](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=4&mode=live&start=24.393461538461533) [well. To demonstrate this, I've prepared a](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=4&mode=live&start=27.788499999999996) [file with a bug under the 6-os folder](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=4&mode=live&start=30.414400000000004) [here. File 4-bug has a simple function](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=4&mode=live&start=33.28693333333333) [that is supposed to take an array and](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=4&mode=live&start=35.55614285714287) [convert into an object. So here is some](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=4&mode=live&start=38.103) [test input, this is an array, and you can](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=4&mode=live&start=41.58757142857143) [see the output that I am expecting here.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=4&mode=live&start=45.147909090909096) [It's supposed to convert the array into an](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=4&mode=live&start=47.673) [object. You can easily convert an array](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=4&mode=live&start=50.235666666666646) [into anything using the powerful reduce](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=4&mode=live&start=53.078307692307675) [function. However, when we run this file,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=4&mode=live&start=55.60061538461535) [node 4-bug, we don't get the expected](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=4&mode=live&start=58.81515384615385) [output, but rather a weird one. So what is](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=4&mode=live&start=62.075) [going on here? We can debug! Simply run](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=4&mode=live&start=64.87700000000004) [this file with --inspect-brk, brk here](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=4&mode=live&start=69.20600000000002) [means break, so don't execute anything at](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=4&mode=live&start=73.28000000000003) [first but rather stop in a debugging](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=4&mode=live&start=76.23985714285715) [state. When you run this, it starts the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=4&mode=live&start=78.90085714285715) [debugging utility. It doesn't run the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=4&mode=live&start=81.95266666666663) [file. Now in your Chrome, go to this](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=4&mode=live&start=84.23279999999998)[special URL: chome://inspect. You'll see](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=4&mode=live&start=89.47769999999997) [your Node process listed here inside](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=4&mode=live&start=92.30466666666668) [targets, and it is inspecting our file.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=4&mode=live&start=94.5296666666667) [Click on this inspect link. And just like](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=4&mode=live&start=97.790875) [that, you have the powerful Chrome dev](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=4&mode=live&start=101.80723076923076) [tools working for your Node script. How](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=4&mode=live&start=104.26476923076918) [cool is that? This is really a big deal.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=4&mode=live&start=106.73953846153849) [Go ahead and try it out and see how fast](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=4&mode=live&start=109.938) [you can find bugs now. You can place and](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=4&mode=live&start=112.63200000000005) [clear breakpoints, you can set watchers,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=4&mode=live&start=115.77900000000001) [you can step-over, step-into function](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=4&mode=live&start=118.479) [calls, you can use the console to see](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=4&mode=live&start=120.3599090909091) [values and structures, and many other](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=4&mode=live&start=123.27354545454547) [powerful features, really. And before we](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=4&mode=live&start=125.24318181818187) [debug this code, note how, the wrapping](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=4&mode=live&start=127.35549999999999) [function showed up here, because every](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=4&mode=live&start=129.98633333333333) [Node module gets this wrapper. You don't](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=4&mode=live&start=132.2766666666667) [just execute your own code. You execute](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=4&mode=live&start=135.00414285714282) [your code within a function. So this is a](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=4&mode=live&start=137.81864285714275) [good reminder here, right? All right, so](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=4&mode=live&start=141.1871333333333) [let's debug this code. Let's place a](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=4&mode=live&start=143.56386666666654) [breakpoint right here on line 3, which is](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=4&mode=live&start=146.08880000000002) [inside the reduce function. My expectation](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=4&mode=live&start=149.20026666666675) [here is that the line should be called](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=4&mode=live&start=151.41666666666666) [five times, and each time it should have](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=4&mode=live&start=154.05933333333329) [an accumulated version of the desired](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=4&mode=live&start=157.50953846153843) [object. And now, click the resume button](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=4&mode=live&start=160.29907692307685) [here and it should stop on the first call](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=4&mode=live&start=162.51600000000002) [of this line. And it did. Now you can](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=4&mode=live&start=165.2135) [hover over the variables here to see their](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=4&mode=live&start=168.46700000000007) [values, or you can just use the console.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=4&mode=live&start=170.98793333333333)[log to see the values as well. So it looks](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=4&mode=live&start=173.13779999999997) [like the current is an empty object, and](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=4&mode=live&start=176.68599999999992) [the accumulator is not an empty object. So](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=4&mode=live&start=179.907875) [this right there is not matching my](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=4&mode=live&start=183.613) [expectations. The accumulator should be an](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=4&mode=live&start=186.03500000000003) [empty object at first, and the current](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=4&mode=live&start=187.84475000000006) [should point to the current element that](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=4&mode=live&start=189.894) [we're iterating over. So right away you](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=4&mode=live&start=191.92329999999993) [realize that the current and the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=4&mode=live&start=194.34315384615388) [accumulator are swapped. The first](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=4&mode=live&start=196.6683846153847) [argument is the accumulator, and the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=4&mode=live&start=198.5022857142857) [second argument is the current element. So](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=4&mode=live&start=200.51614285714285) [to fix this bug, all we need to do is make](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=4&mode=live&start=202.81386666666666) [the accumulator first, and the current](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=4&mode=live&start=205.93639999999985) [second, and test to see if that works. And it did.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=4&mode=live&start=207.98772727272728)

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[In this last module, we talked about a few](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=5&mode=live&start=1.031) [built-in Node modules, I went over a few](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=5&mode=live&start=4.387250000000001) [of the capabilities of the os module, the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=5&mode=live&start=6.8986666666666645) [fs module, the child\_process module, and I](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=5&mode=live&start=9.126933333333332) [showed you how you can debug Node](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=5&mode=live&start=11.260666666666665) [applications using Chrome dev tools, which](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=5&mode=live&start=13.468) [is my favorite feature in modern Node.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=5&mode=live&start=15.520923076923072) [It's a wrap on this course! I hope you've](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=5&mode=live&start=17.916) [enjoyed it and learned a thing or two.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=5&mode=live&start=21.267214285714296) [Please don't hesitate to leave me any](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=5&mode=live&start=24.11346153846154)[feedback or ask any questions in the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=5&mode=live&start=26.41053846153846) [Discussions tab at the course page. 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If you're excited about](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=5&mode=live&start=38.927357142857105) [Node and you're ready to learn more, check](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=5&mode=live&start=40.96681818181819)[out the Advanced Node. js course here at](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=5&mode=live&start=43.0223) [Pluralsight, after understanding](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=5&mode=live&start=45.3287) [everything in this course, I think you're](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=5&mode=live&start=46.11122222222222) [definitely ready for this advanced one.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=5&mode=live&start=47.841) [And if you like books, I wrote a book as](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=5&mode=live&start=50.183) [well about some of the advanced concepts](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=5&mode=live&start=51.83699999999998) [in Node. If you like smaller reads about](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=5&mode=live&start=53.715500000000006)[Node, I actively blog on Medium. com and a](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=5&mode=live&start=56.824538461538474) [lot of what I write is about Node and](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=5&mode=live&start=59.80733333333334) [JavaScript. Here's one other thing you can](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=5&mode=live&start=62.42783333333336) [do. 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Don't get distracted by my awesome](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=5&mode=live&start=70.06855555555559) [score here, I can't brag about that](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=5&mode=live&start=72.12969230769232) [because yours truly wrote the questions of](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=5&mode=live&start=74.115) [this skill IQ test. 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If you do take the score, tweet about](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=5&mode=live&start=89.20127272727275) [it and ping me on Twitter. Putting these](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=5&mode=live&start=91.76785714285717) [courses together is a long and hard work,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=5&mode=live&start=93.92507692307693) [it'll be nice to hear if that effort](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=5&mode=live&start=96.01738461538464)[helped you! Good luck and thanks for watching.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=1ced6c9f-3be7-438c-8f9e-66182754b2e1&clip=5&mode=live&start=101.802)

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I'm](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=36ef38fd-1ec3-490c-809d-bbbd9fb05b15&clip=0&mode=live&start=27.291538461538458) [excited to show you how Node is going to](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=36ef38fd-1ec3-490c-809d-bbbd9fb05b15&clip=0&mode=live&start=28.996307692307678) [make your life, as a back end developer,](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=36ef38fd-1ec3-490c-809d-bbbd9fb05b15&clip=0&mode=live&start=31.35053333333333) [so much easier. I mostly write code in](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=36ef38fd-1ec3-490c-809d-bbbd9fb05b15&clip=0&mode=live&start=33.62360000000002) [this course and you should do too.](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=36ef38fd-1ec3-490c-809d-bbbd9fb05b15&clip=0&mode=live&start=36.05683333333334) [Learning to code is mostly a practical](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=36ef38fd-1ec3-490c-809d-bbbd9fb05b15&clip=0&mode=live&start=38.27) [experience. Try to do and redo the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=36ef38fd-1ec3-490c-809d-bbbd9fb05b15&clip=0&mode=live&start=40.78824999999999) [examples I'll present in this course and](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=36ef38fd-1ec3-490c-809d-bbbd9fb05b15&clip=0&mode=live&start=42.58842857142856) [try to expand their scope, and challenge](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=36ef38fd-1ec3-490c-809d-bbbd9fb05b15&clip=0&mode=live&start=44.26892857142854) [yourself with every piece of knowledge](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=36ef38fd-1ec3-490c-809d-bbbd9fb05b15&clip=0&mode=live&start=46.50427272727272) [that you learn. Some of the topics that we](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=36ef38fd-1ec3-490c-809d-bbbd9fb05b15&clip=0&mode=live&start=48.441384615384614) [will cover in this course include the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=36ef38fd-1ec3-490c-809d-bbbd9fb05b15&clip=0&mode=live&start=50.91084615384612) [what, why and how of Node. js, a review of](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=36ef38fd-1ec3-490c-809d-bbbd9fb05b15&clip=0&mode=live&start=53.3842857142857) [the modern JavaScript concepts, Node's](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=36ef38fd-1ec3-490c-809d-bbbd9fb05b15&clip=0&mode=live&start=57.51) [REPL and command line interface, Node's](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=36ef38fd-1ec3-490c-809d-bbbd9fb05b15&clip=0&mode=live&start=59.55888888888888) [patterns, globals, and utilities, Node's](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=36ef38fd-1ec3-490c-809d-bbbd9fb05b15&clip=0&mode=live&start=62.811) [package manager, npm, working with](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=36ef38fd-1ec3-490c-809d-bbbd9fb05b15&clip=0&mode=live&start=66.632125) [CommonJS modules, Node's concurrency and](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=36ef38fd-1ec3-490c-809d-bbbd9fb05b15&clip=0&mode=live&start=69.60774999999998) [event loop, working with web servers, and](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=36ef38fd-1ec3-490c-809d-bbbd9fb05b15&clip=0&mode=live&start=72.12666666666667) [working with the operating system. By the](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=36ef38fd-1ec3-490c-809d-bbbd9fb05b15&clip=0&mode=live&start=75.32033333333334) [end of this course, you should be](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=36ef38fd-1ec3-490c-809d-bbbd9fb05b15&clip=0&mode=live&start=78.496) [comfortable creating and executing code](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=36ef38fd-1ec3-490c-809d-bbbd9fb05b15&clip=0&mode=live&start=80.225) [for Node, understand the big pictures of](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=36ef38fd-1ec3-490c-809d-bbbd9fb05b15&clip=0&mode=live&start=81.782) [the runtime and build simply back end](https://app.pluralsight.com/player?course=nodejs-getting-started&author=samer-buna&name=36ef38fd-1ec3-490c-809d-bbbd9fb05b15&clip=0&mode=live&start=84.638) [applications with it. 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