This set of slides illustrate the steps for installing Node.js and Express on Windows. **Please don't print it in order to save paper!**

CSCI 4140 – Tutorial 6

Installing Node.js and Express on Windows

Matt YIU, Man Tung (mtyiu@cse)

SHB 118

Office Hour: Wednesday, 3-5 pm

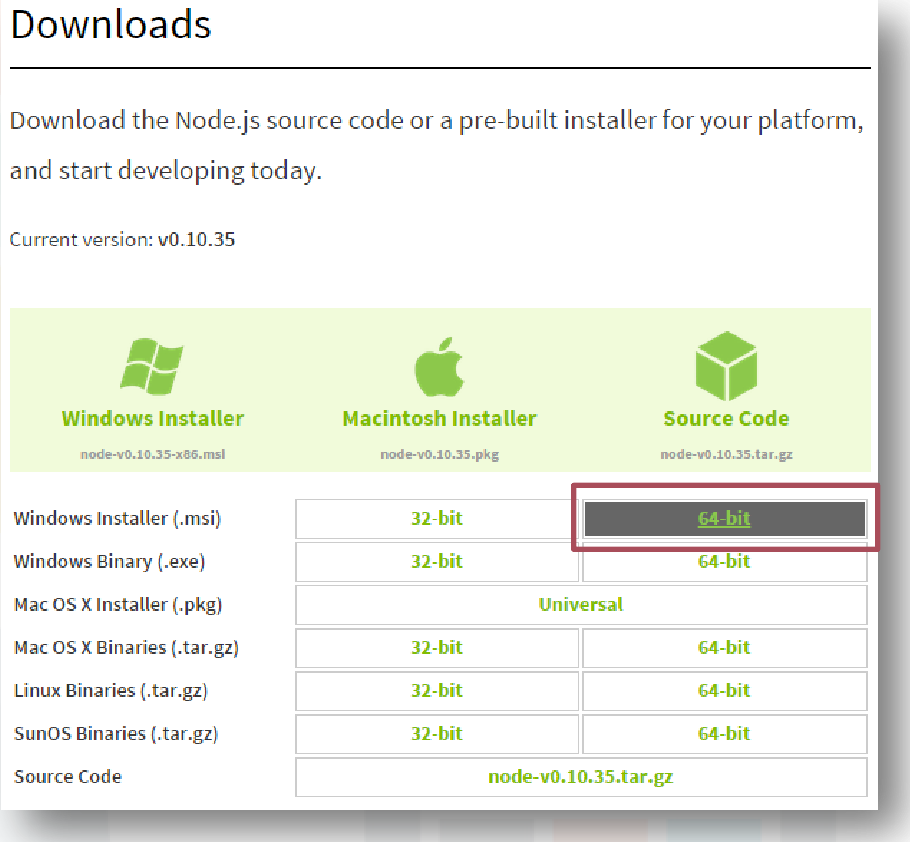
2016.03.03

Installing Node.js on Windows

Next, next, next, accept, install... FINISH

Step 1: Download the Windows installer

- Download the latest version of Node.js from http://nodejs.org/download/
- Most of you should be using 64-bit machine already ☺



Downloads

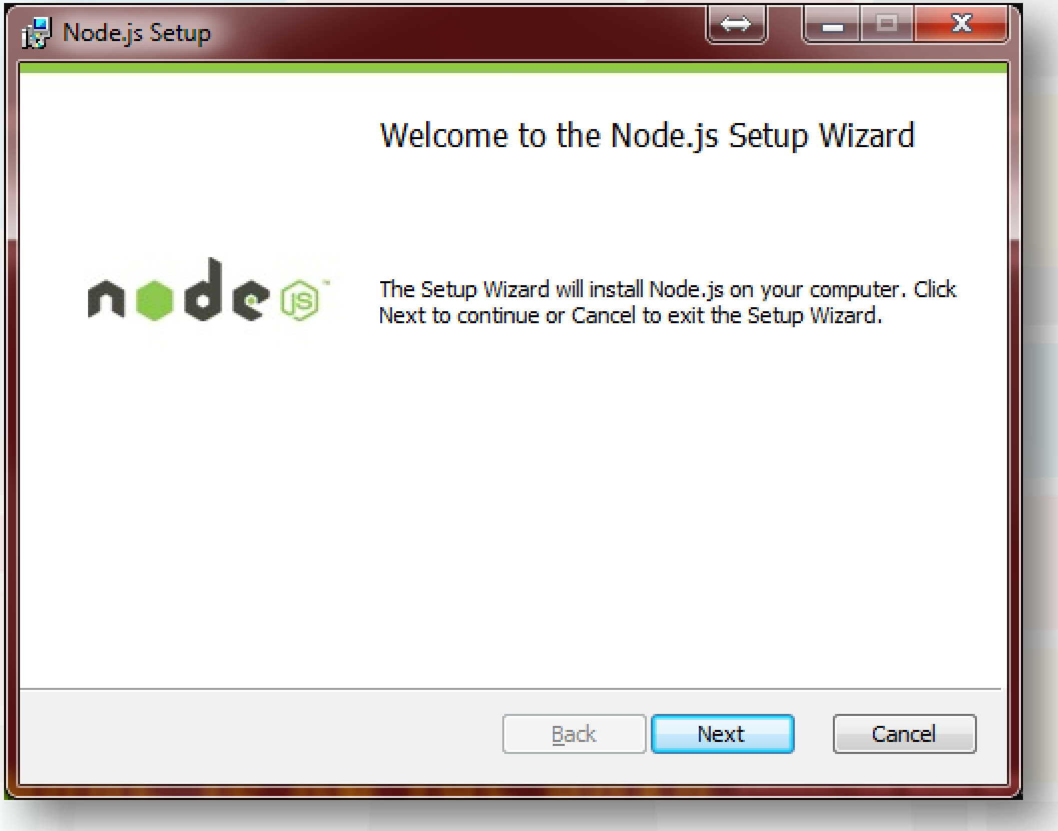
Download the Node.js source code or a pre-built installer for your platform, and start developing today.

Current version: v0.10.35

Windows Installer (.msi)	32-bit	64-bit
Windows Binary (.exe)	32-bit	64-bit
Mac OS X Installer (.pkg)	Universal	
Mac OS X Binaries (.tar.gz)	32-bit	64-bit
Linux Binaries (.tar.gz)	32-bit	64-bit
SunOS Binaries (.tar.gz)	32-bit	64-bit
Source Code	node-v0.10.35.tar.gz	

Step 2: Install Node.js

- Execute the installer…*Next, next, …*

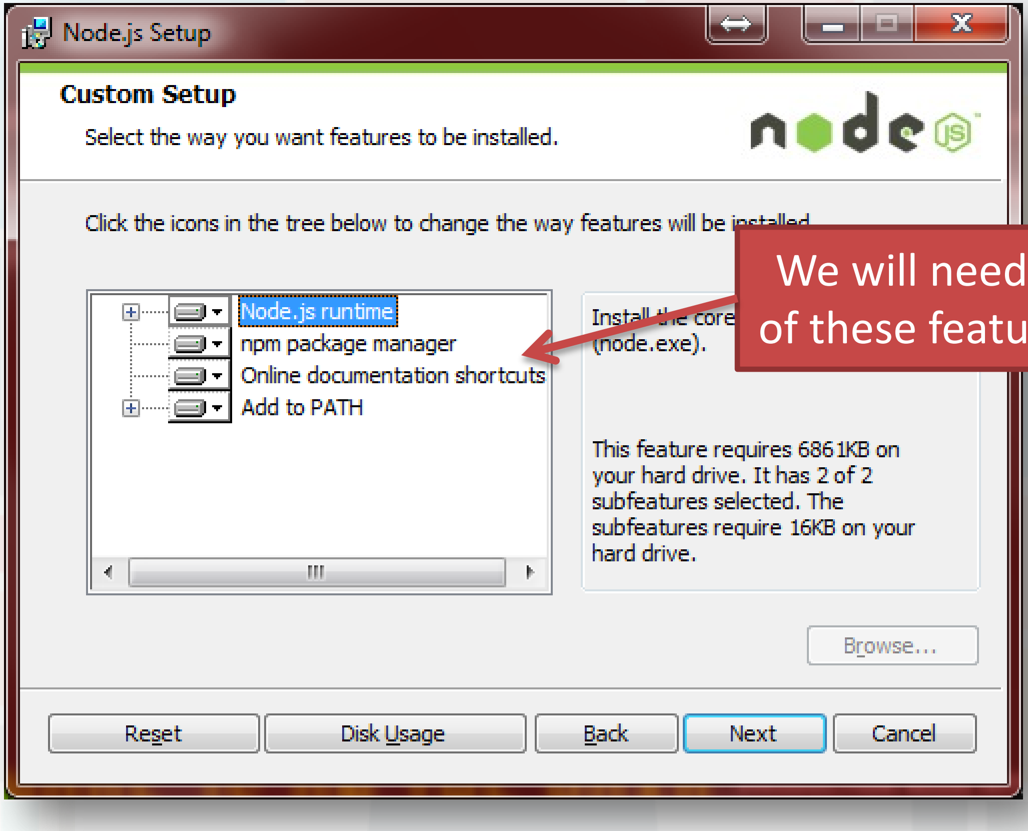


Welcome to the Node.js Setup Wizard

The Setup Wizard will install Node.js on your computer. Click Next to continue or Cancel to exit the Setup Wizard.

Step 2: Install Node.js

- Execute the installer…*Next, next, …*



Node.js Setup

Custom Setup

Select the way you want features to be installed.

Click the icons in the tree below to change the way features will be installed.

- Node.js runtime
  - npm package manager
  - Online documentation shortcuts
- Add to PATH

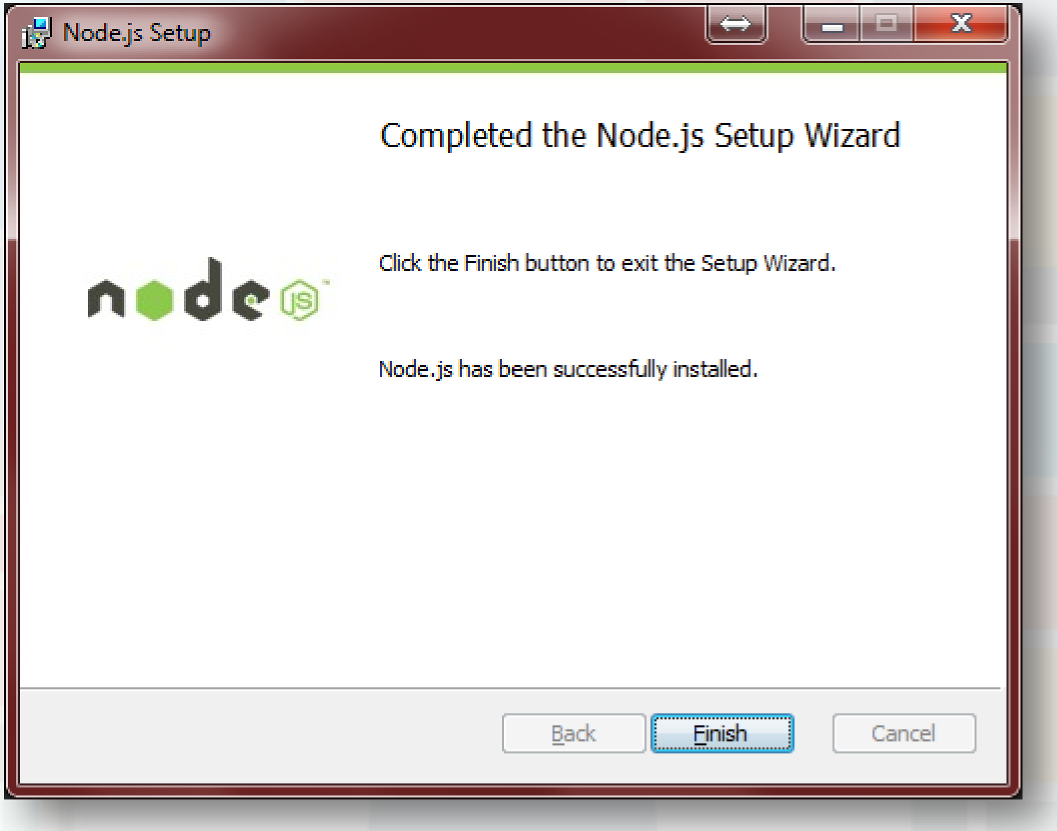
Install the core Node.js runtime (node.exe).

This feature requires 6861KB on your hard drive. It has 2 of 2 subfeatures selected. The subfeatures require 16KB on your hard drive.

We will need all of these features.

Step 2: Install Node.js

- Finish!



Node.js Setup

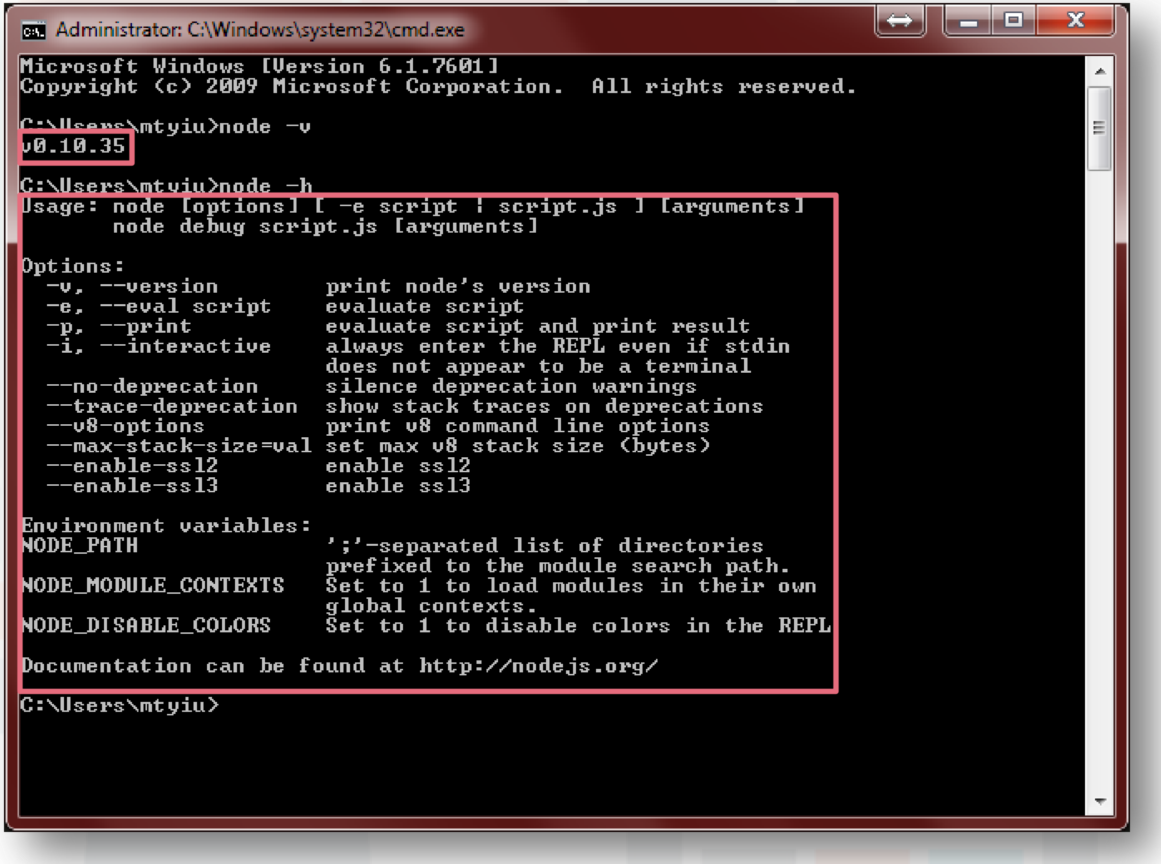
Completed the Node.js Setup Wizard

Click the Finish button to exit the Setup Wizard.

Node.js has been successfully installed.

Step 3: Test your Node.js installation

- Open your command prompt:
  - Windows Key + R → Type "cmd"
- Enter "**node -v**" to display the version number of your Node.js installation
- Enter "**node -h**" to display the help message of Node.js



```
Microsoft Windows [Version 6.1.7601]
Copyright (c) 2009 Microsoft Corporation.  All rights reserved.

C:\Users\mtyiu>node -v
v0.10.35

C:\Users\mtyiu>node -h
Usage: node [options] [ -e script | script.js ] [arguments]
       node debug script.js [arguments]

Options:
  -v, --version        print node's version
  -e, --eval script    evaluate script
  -p, --print          evaluate script and print result
  -i, --interactive    always enter the REPL even if stdin
                       does not appear to be a terminal
  --no-deprecation     silence deprecation warnings
  --trace-deprecation  show stack traces on deprecations
  --v8-options         print v8 command line options
  --max-stack-size=val set max v8 stack size (bytes)
  --enable-ssl2        enable ssl2
  --enable-ssl3        enable ssl3

Environment variables:
NODE_PATH              ';'-separated list of directories
                       prefixed to the module search path.
NODE_MODULE_CONTEXTS   Set to 1 to load modules in their own
                       global contexts.
NODE_DISABLE_COLORS    Set to 1 to disable colors in the REPL

Documentation can be found at http://nodejs.org/

C:\Users\mtyiu>
```

Step 4: “Hello World”!

- Time to write our first Node.js program!

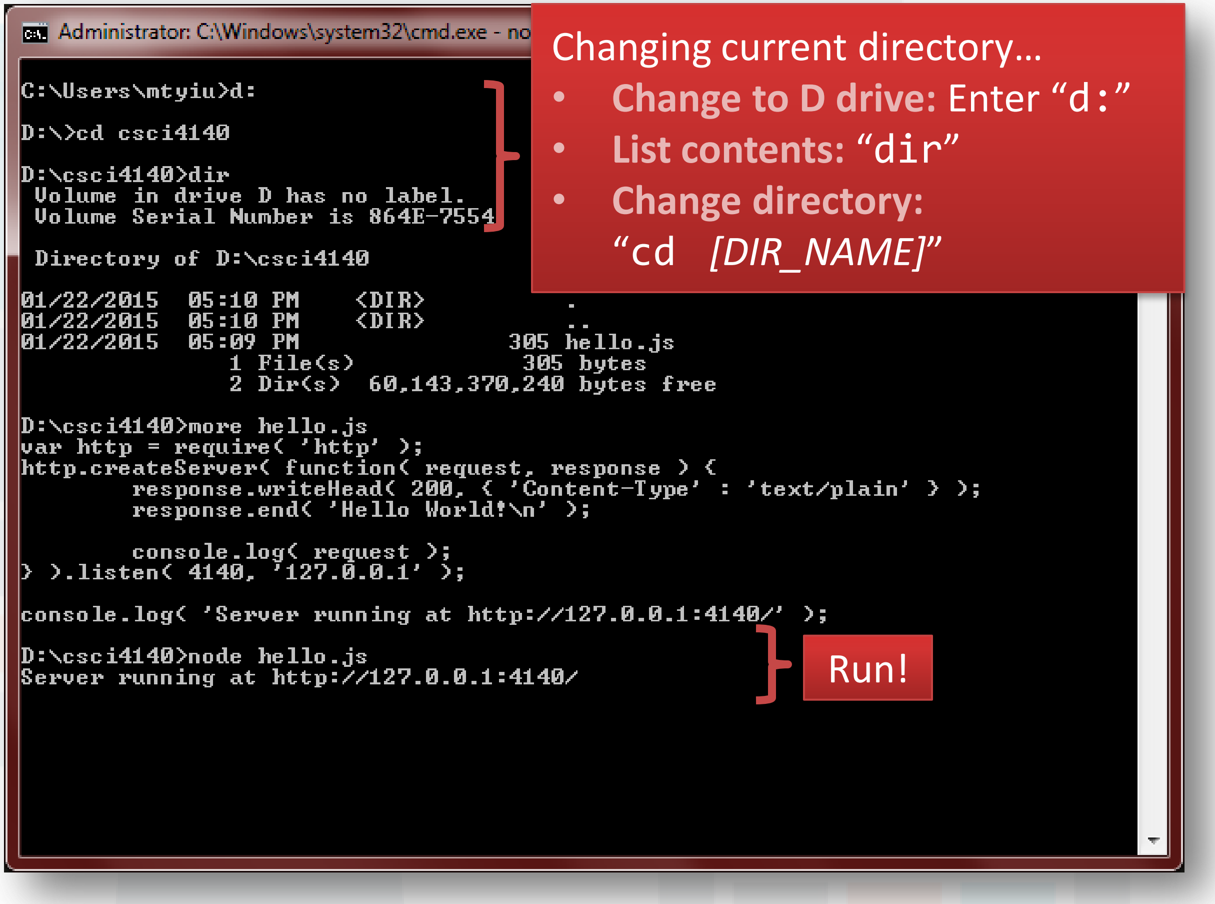
```
var http = require( 'http' );
http.createServer( function( request, response ) {
    response.writeHead( 200, { 'Content-Type' : 'text/plain' } );
    response.end( 'Hello World!\n' );
} ).listen( 4140, '127.0.0.1' );

console.log( 'Server running at http://127.0.0.1:4140/' );
```

hello.js

- Save the program anywhere you like
  - In this example, the file is saved under “`D:\csci4140`”

Step 5: Say “Hello World” to the World!

- Get back to your command prompt again…
- Change the current directory to where `hello.js` is saved
- Execute “**`node hello.js`**” (simple enough?)



Administrator: C:\Windows\system32\cmd.exe - no

```
C:\Users\mtyiu>d:

D:\>cd csci4140

D:\csci4140>dir
 Volume in drive D has no label.
 Volume Serial Number is 864E-7554

 Directory of D:\csci4140

01/22/2015  05:10 PM    <DIR>          .
01/22/2015  05:10 PM    <DIR>          ..
01/22/2015  05:09 PM               305 hello.js
               1 File(s)            305 bytes
               2 Dir(s)  60,143,370,240 bytes free

D:\csci4140>more hello.js
var http = require( 'http' );
http.createServer( function( request, response ) {
        response.writeHead( 200, { 'Content-Type' : 'text/plain' } );
        response.end( 'Hello World!\n' );

        console.log( request );
} ).listen( 4140, '127.0.0.1' );

console.log( 'Server running at http://127.0.0.1:4140/' );

D:\csci4140>node hello.js
Server running at http://127.0.0.1:4140/
```

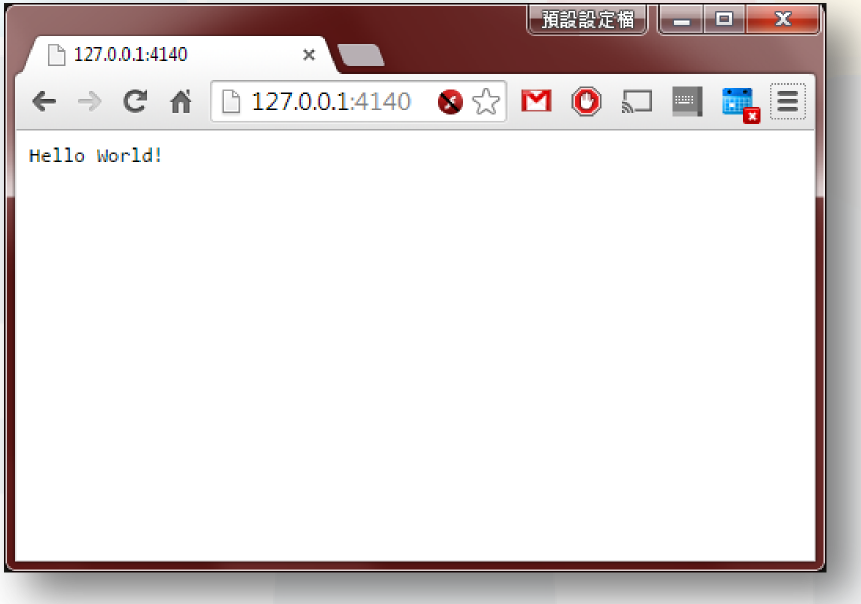
Changing current directory…

- **Change to D drive:** Enter “`d:`”
- **List contents:** “`dir`”
- **Change directory:** “`cd` *[DIR_NAME]*”

Run!

Step 5: Say “Hello World” to the World!

- Your first Node.js program is ready to test! Now use your browser to visit: http://127.0.0.1:4140/
- Can you see the result?



```
Hello World!
```

Installing Express on Windows

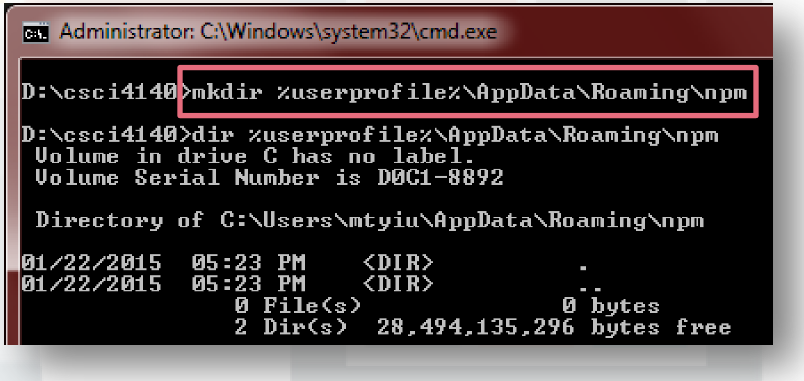
We will use npm package manager to install the Node.js framework.

Step 1. Initialize npm

- Don't ask me why…the Node.js installer does not create a folder for npm…
  - If you execute "npm" in the command prompt, you may get this error:

```
Error: ENOENT, stat 'C:\Users\[Username]\AppData\Roaming\npm'
```

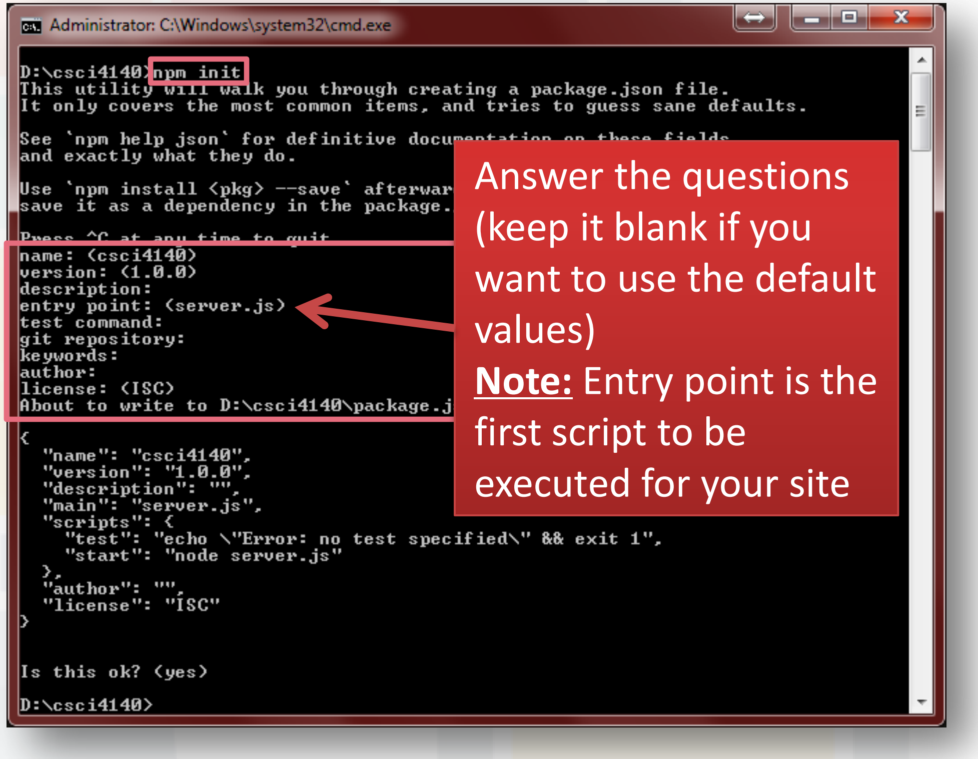
- To solve this problem, create the directory at the displayed path in command prompt: "**mkdir %userprofile%\AppData\Roaming\npm**"
  - You may need to run the command prompt as an administrator



```
D:\csci4140>mkdir %userprofile%\AppData\Roaming\npm

D:\csci4140>dir %userprofile%\AppData\Roaming\npm
 Volume in drive C has no label.
 Volume Serial Number is D0C1-8892

 Directory of C:\Users\mtyiu\AppData\Roaming\npm

01/22/2015  05:23 PM    <DIR>          .
01/22/2015  05:23 PM    <DIR>          ..
               0 File(s)              0 bytes
               2 Dir(s)  28,494,135,296 bytes free
```

Step 2. Create a `package.json` file

- Go to your project folder. We are going to create `package.json` for our new project with npm
  - `package.json` holds various **metadata** relevant to the project
  - It allows npm (Node.js package manager) to **identify the project** as well as handle the **project's dependencies**
- Execute "**`npm init`**"



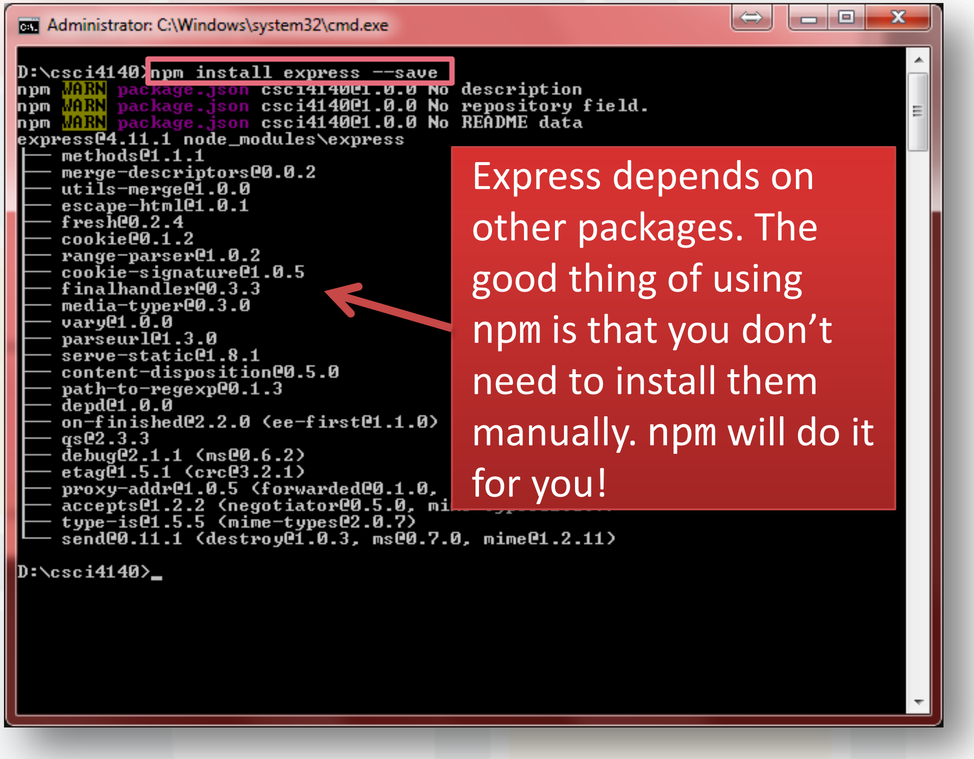
```
D:\csci4140>npm init
This utility will walk you through creating a package.json file.
It only covers the most common items, and tries to guess sane defaults.

See `npm help json` for definitive documentation on these fields
and exactly what they do.

Use `npm install <pkg> --save` afterwar
save it as a dependency in the package.

Press ^C at any time to quit.
name: (csci4140)
version: (1.0.0)
description:
entry point: (server.js)
test command:
git repository:
keywords:
author:
license: (ISC)
About to write to D:\csci4140\package.j

{
  "name": "csci4140",
  "version": "1.0.0",
  "description": "",
  "main": "server.js",
  "scripts": {
    "test": "echo \"Error: no test specified\" && exit 1",
    "start": "node server.js"
  },
  "author": "",
  "license": "ISC"
}


Is this ok? (yes)

D:\csci4140>
```

Answer the questions (keep it blank if you want to use the default values)

Note: Entry point is the first script to be executed for your site

Step 3. Install Express

- We are ready to install Express now
  - Express is a "*Fast, unopinionated, minimalist web framework for Node.js*"
  - It is useful for building web applications
- Execute "`npm install express --save`"
  - This installs Express in the app directory and save it in the dependencies list

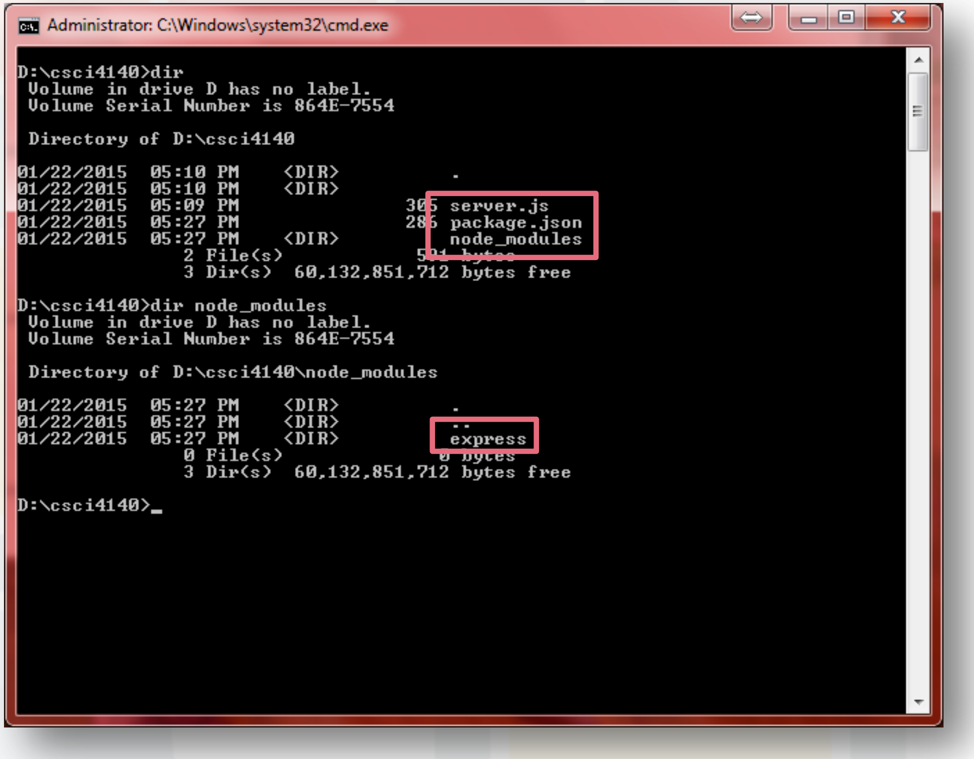


```
D:\csci4140>npm install express --save
npm WARN package.json csci4140@1.0.0 No description
npm WARN package.json csci4140@1.0.0 No repository field.
npm WARN package.json csci4140@1.0.0 No README data
express@4.11.1 node_modules\express
├── methods@1.1.1
├── merge-descriptors@0.0.2
├── utils-merge@1.0.0
├── escape-html@1.0.1
├── fresh@0.2.4
├── cookie@0.1.2
├── range-parser@1.0.2
├── cookie-signature@1.0.5
├── finalhandler@0.3.3
├── media-typer@0.3.0
├── vary@1.0.0
├── parseurl@1.3.0
├── serve-static@1.8.1
├── content-disposition@0.5.0
├── path-to-regexp@0.1.3
├── depd@1.0.0
├── on-finished@2.2.0 (ee-first@1.1.0)
├── qs@2.3.3
├── debug@2.1.1 (ms@0.6.2)
├── etag@1.5.1 (crc@3.2.1)
├── proxy-addr@1.0.5 (forwarded@0.1.0,
├── accepts@1.2.2 (negotiator@0.5.0, mi
├── type-is@1.5.5 (mime-types@2.0.7)
└── send@0.11.1 (destroy@1.0.3, ms@0.7.0, mime@1.2.11)

D:\csci4140>_
```

Express depends on other packages. The good thing of using npm is that you don't need to install them manually. npm will do it for you!

Step 3. Install Express

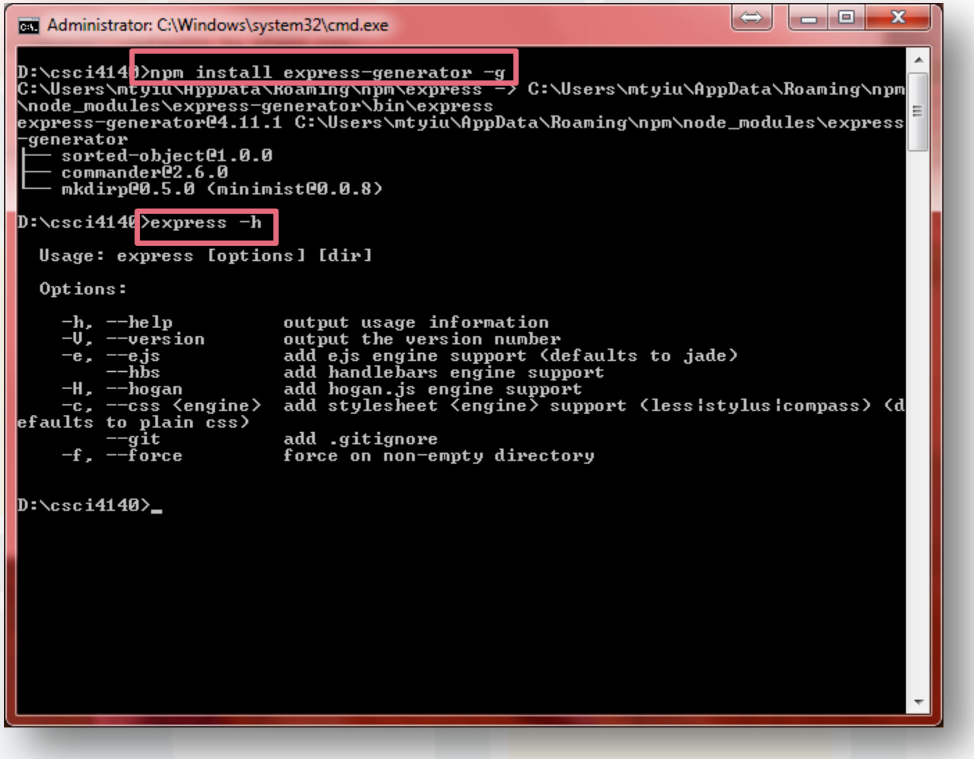
- Check your installation. There should be a new directory called “`node_modules`”
- Inside “`node_modules`”, a directory called “`express`” is created



```
D:\csci4140>dir
 Volume in drive D has no label.
 Volume Serial Number is 864E-7554

 Directory of D:\csci4140

01/22/2015  05:10 PM    <DIR>          .
01/22/2015  05:10 PM    <DIR>          ..
01/22/2015  05:09 PM               305 server.js
01/22/2015  05:27 PM               286 package.json
01/22/2015  05:27 PM    <DIR>          node_modules
               2 File(s)            591 bytes
               3 Dir(s)  60,132,851,712 bytes free

D:\csci4140>dir node_modules
 Volume in drive D has no label.
 Volume Serial Number is 864E-7554

 Directory of D:\csci4140\node_modules

01/22/2015  05:27 PM    <DIR>          .
01/22/2015  05:27 PM    <DIR>          ..
01/22/2015  05:27 PM    <DIR>          express
               0 File(s)              0 bytes
               3 Dir(s)  60,132,851,712 bytes free

D:\csci4140>_
```

Step 4. Install Express application generator

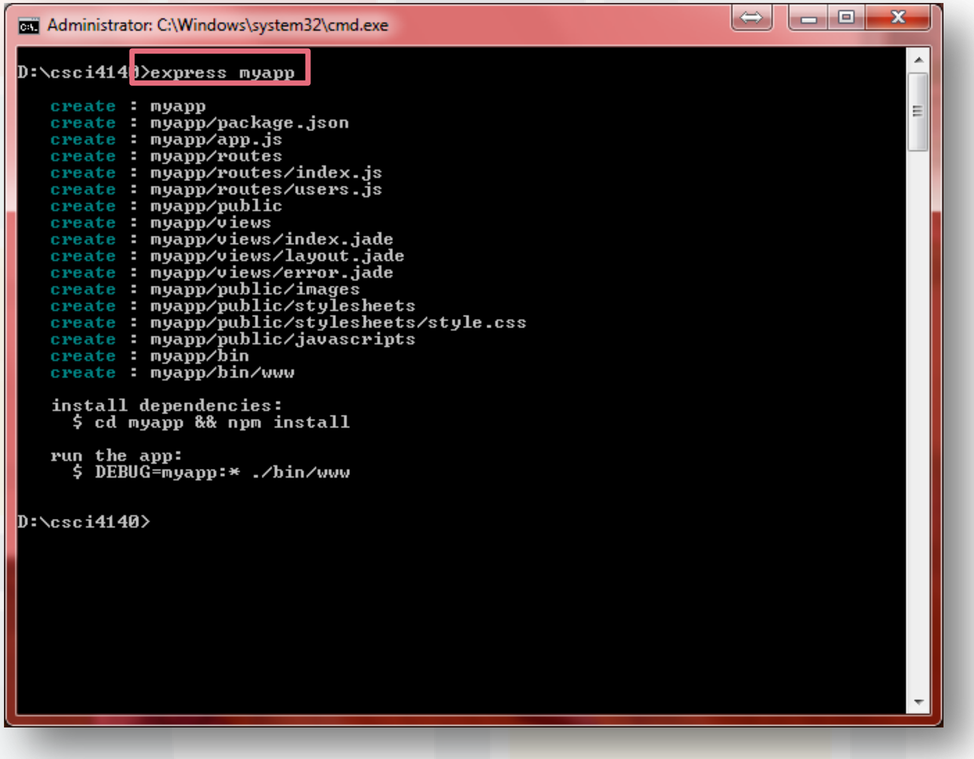
- Next, we will install Express application generator
  - It is used to quickly create a Express application skeleton
  - This saves your work from defining the structure yourself!
- Execute “**`npm install express-generator -g`**”
- After installation, execute “**`express -h`**” to check your installation



```
D:\csci4140>npm install express-generator -g
C:\Users\mtyiu\AppData\Roaming\npm\express -> C:\Users\mtyiu\AppData\Roaming\npm
\node_modules\express-generator\bin\express
express-generator@4.11.1 C:\Users\mtyiu\AppData\Roaming\npm\node_modules\express
-generator
├── sorted-object@1.0.0
├── commander@2.6.0
└── mkdirp@0.5.0 (minimist@0.0.8)

D:\csci4140>express -h

  Usage: express [options] [dir]

  Options:

    -h, --help          output usage information
    -V, --version       output the version number
    -e, --ejs           add ejs engine support (defaults to jade)
        --hbs           add handlebars engine support
    -H, --hogan         add hogan.js engine support
    -c, --css <engine>  add stylesheet <engine> support (less|stylus|compass) (d
efaults to plain css)
        --git           add .gitignore
    -f, --force         force on non-empty directory


D:\csci4140>_
```

Step 5. Create an Express app

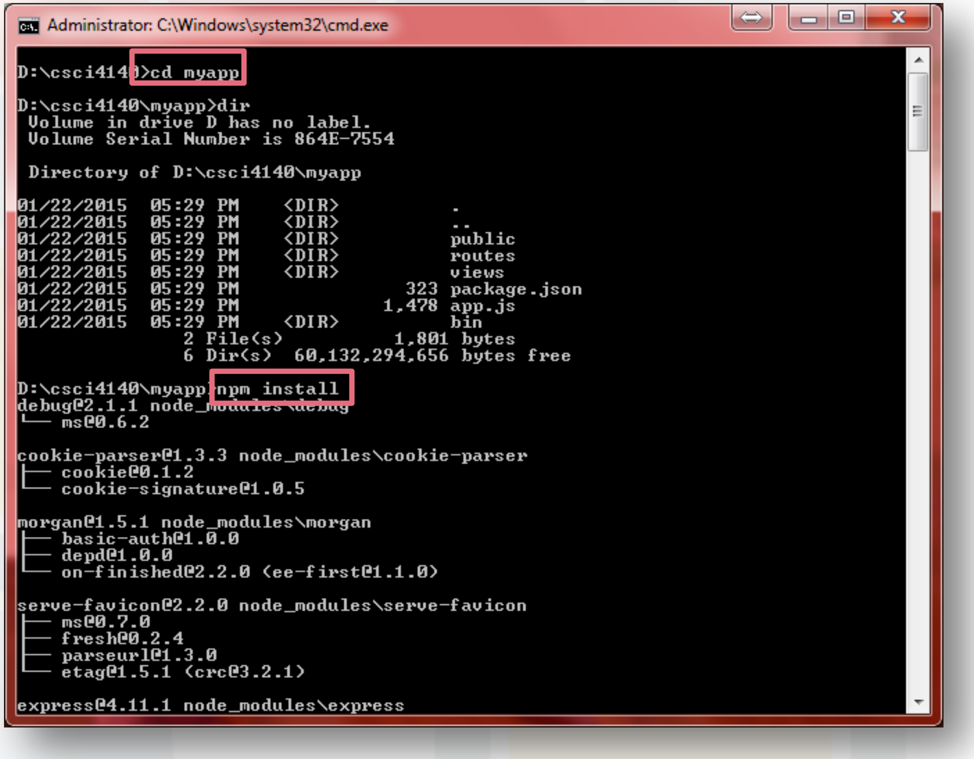
- Use the generator to create our first Express app (let's call it myapp)
- Execute "**express myapp**"
  - Files are created under the directory "myapp"



```
D:\csci4140>express myapp

   create : myapp
   create : myapp/package.json
   create : myapp/app.js
   create : myapp/routes
   create : myapp/routes/index.js
   create : myapp/routes/users.js
   create : myapp/public
   create : myapp/views
   create : myapp/views/index.jade
   create : myapp/views/layout.jade
   create : myapp/views/error.jade
   create : myapp/public/images
   create : myapp/public/stylesheets
   create : myapp/public/stylesheets/style.css
   create : myapp/public/javascripts
   create : myapp/bin
   create : myapp/bin/www

   install dependencies:
     $ cd myapp && npm install

   run the app:
     $ DEBUG=myapp:* ./bin/www

D:\csci4140>
```

Step 6. Install dependencies

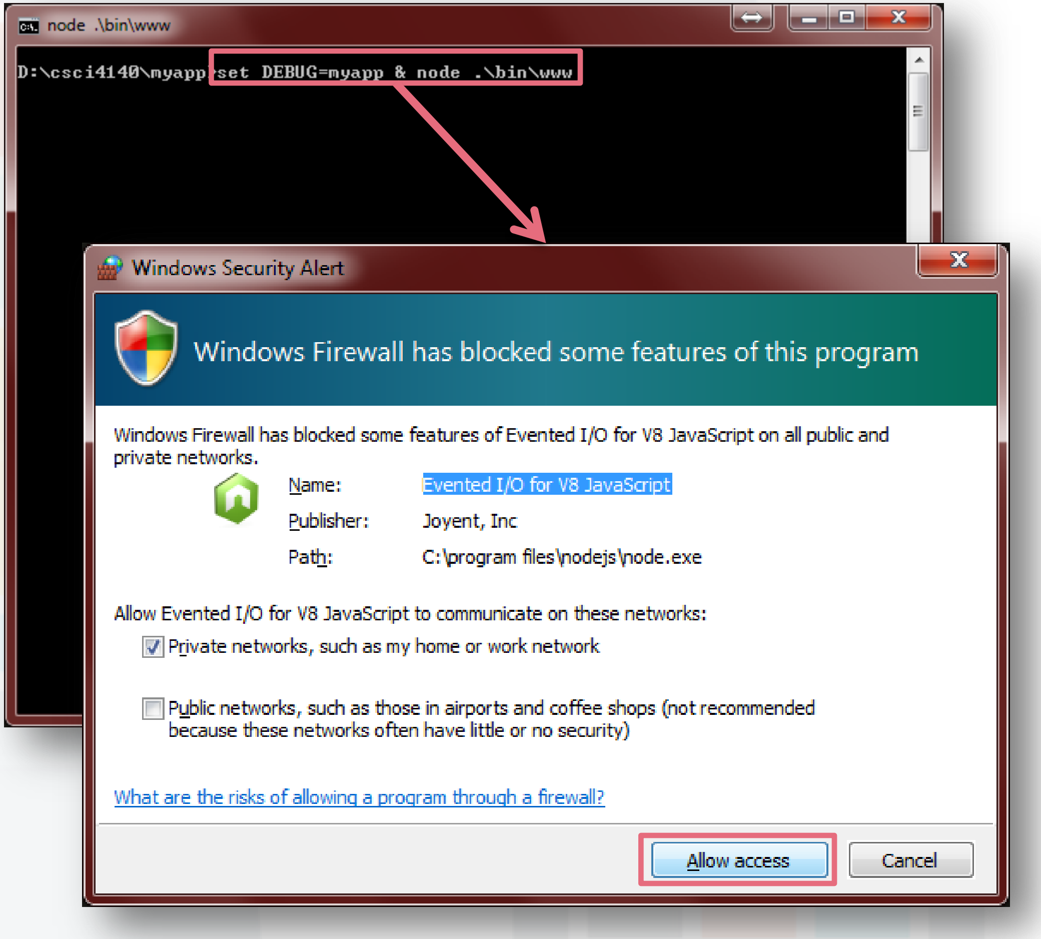
- Change the current directory to myapp with “`cd myapp`”
- Install dependencies with “`npm install`”



```
D:\csci4140>cd myapp

D:\csci4140\myapp>dir
 Volume in drive D has no label.
 Volume Serial Number is 864E-7554

 Directory of D:\csci4140\myapp

01/22/2015  05:29 PM    <DIR>          .
01/22/2015  05:29 PM    <DIR>          ..
01/22/2015  05:29 PM    <DIR>          public
01/22/2015  05:29 PM    <DIR>          routes
01/22/2015  05:29 PM    <DIR>          views
01/22/2015  05:29 PM               323 package.json
01/22/2015  05:29 PM             1,478 app.js
01/22/2015  05:29 PM    <DIR>          bin
               2 File(s)          1,801 bytes
               6 Dir(s)  60,132,294,656 bytes free

D:\csci4140\myapp>npm install
debug@2.1.1 node_modules\debug
└── ms@0.6.2

cookie-parser@1.3.3 node_modules\cookie-parser
├── cookie@0.1.2
└── cookie-signature@1.0.5

morgan@1.5.1 node_modules\morgan
├── basic-auth@1.0.0
├── depd@1.0.0
└── on-finished@2.2.0 (ee-first@1.1.0)

serve-favicon@2.2.0 node_modules\serve-favicon
├── ms@0.7.0
├── fresh@0.2.4
├── parseurl@1.3.0
└── etag@1.5.1 (crc@3.2.1)

express@4.11.1 node_modules\express
```

Step 7. Run the app

- Let’s run the app to see what has been created
- Execute “**`set DEBUG=myapp & node .\bin\www`**”
- If you encounter a Windows Security Alert, press “Allow access”



```
D:\csci4140\myapp>set DEBUG=myapp & node .\bin\www
```

Windows Security Alert

Windows Firewall has blocked some features of this program

Windows Firewall has blocked some features of Evented I/O for V8 JavaScript on all public and private networks.

Name: Evented I/O for V8 JavaScript

Publisher: Joyent, Inc

Path: C:\program files\nodejs\node.exe

Allow Evented I/O for V8 JavaScript to communicate on these networks:

☑ Private networks, such as my home or work network

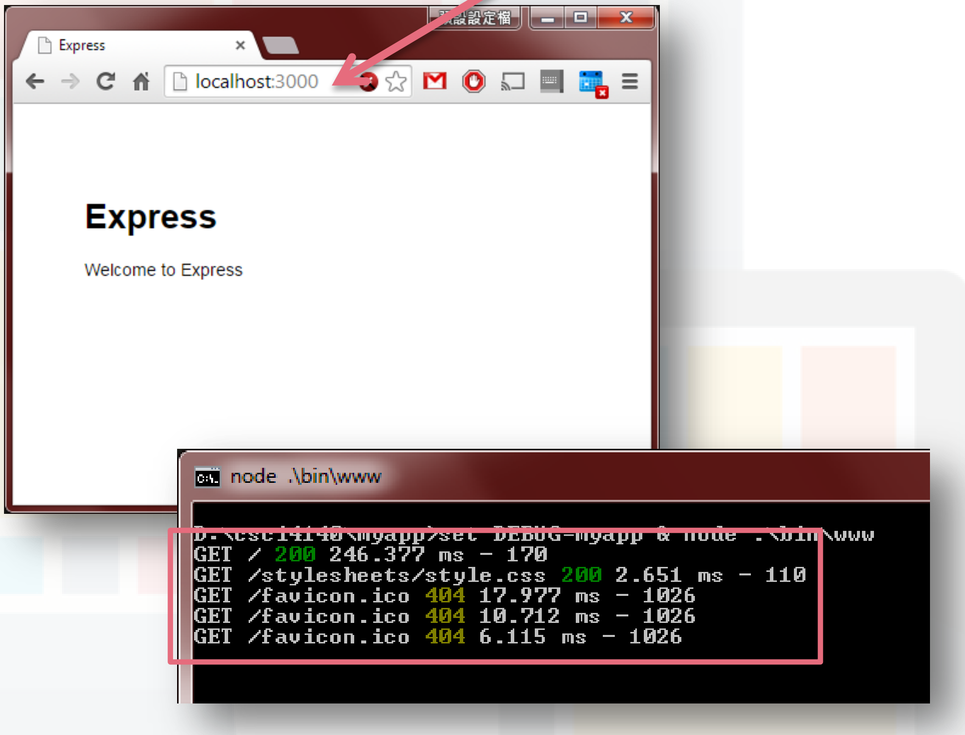
□ Public networks, such as those in airports and coffee shops (not recommended because these networks often have little or no security)

What are the risks of allowing a program through a firewall?

Step 7. Run the app

- Use your browser to visit http://127.0.0.1:3000/
  - The port number used by default is 3000
  - Of course, it is possible to change it
- At the same time, the command prompt will show some debug messages

Note: `localhost` is equivalent to `127.0.0.1`



Express

Welcome to Express

```
D:\csci4140\myapp>set DEBUG=myapp & node .\bin\www
GET / 200 246.377 ms - 170
GET /stylesheets/style.css 200 2.651 ms - 110
GET /favicon.ico 404 17.977 ms - 1026
GET /favicon.ico 404 10.712 ms - 1026
GET /favicon.ico 404 6.115 ms - 1026
```

Congratulations!

- You installed a development environment for Node.js on your Windows machine
- Please refer to the notes for deploying your Node.js applications to Heroku

– End –