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[Course Overview](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=1f7e7b1a-c60d-4783-a00e-56ca07043cb2&clip=0&mode=live)

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At](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=1f7e7b1a-c60d-4783-a00e-56ca07043cb2&clip=0&mode=live&start=19.563)[Google, I was one of the first engineers](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=1f7e7b1a-c60d-4783-a00e-56ca07043cb2&clip=0&mode=live&start=22.56288888888889) [working on real-time collaborative editing](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=1f7e7b1a-c60d-4783-a00e-56ca07043cb2&clip=0&mode=live&start=24.346) [in Google Docs, and I hold four patents](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=1f7e7b1a-c60d-4783-a00e-56ca07043cb2&clip=0&mode=live&start=26.715) [for its underlying technologies. I](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=1f7e7b1a-c60d-4783-a00e-56ca07043cb2&clip=0&mode=live&start=28.651000000000007) [currently work on my own startup,](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=1f7e7b1a-c60d-4783-a00e-56ca07043cb2&clip=0&mode=live&start=31.129285714285714) [Loonycorn, a studio for high quality video](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=1f7e7b1a-c60d-4783-a00e-56ca07043cb2&clip=0&mode=live&start=32.859) [content. Cloud Firestore is a flexible,](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=1f7e7b1a-c60d-4783-a00e-56ca07043cb2&clip=0&mode=live&start=36.7755) [scalable, real-time database where users](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=1f7e7b1a-c60d-4783-a00e-56ca07043cb2&clip=0&mode=live&start=39.07000000000001) [can be notified in real time when data](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=1f7e7b1a-c60d-4783-a00e-56ca07043cb2&clip=0&mode=live&start=40.63566666666665) [changes in the cloud. Firestore is often](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=1f7e7b1a-c60d-4783-a00e-56ca07043cb2&clip=0&mode=live&start=42.803499999999985) [used for mobile and web applications where](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=1f7e7b1a-c60d-4783-a00e-56ca07043cb2&clip=0&mode=live&start=45.33728571428572) [there are multiple clients who need to be](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=1f7e7b1a-c60d-4783-a00e-56ca07043cb2&clip=0&mode=live&start=47.74514285714286) [kept in sync. In this course, we'll study](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=1f7e7b1a-c60d-4783-a00e-56ca07043cb2&clip=0&mode=live&start=50.175333333333334) [the data model and practical usage of two](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=1f7e7b1a-c60d-4783-a00e-56ca07043cb2&clip=0&mode=live&start=52.44499999999999) [real-time databases offered as a part of](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=1f7e7b1a-c60d-4783-a00e-56ca07043cb2&clip=0&mode=live&start=55.61749999999999) [Firebase, Google's mobile and web](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=1f7e7b1a-c60d-4783-a00e-56ca07043cb2&clip=0&mode=live&start=58.39871428571429) [application development platform. First,](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=1f7e7b1a-c60d-4783-a00e-56ca07043cb2&clip=0&mode=live&start=60.15359999999999) [we'll study Cloud Firestore. This is a](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=1f7e7b1a-c60d-4783-a00e-56ca07043cb2&clip=0&mode=live&start=62.4104)[highly scalable and performant NoSQL](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=1f7e7b1a-c60d-4783-a00e-56ca07043cb2&clip=0&mode=live&start=65.26771428571428) [database which allows for very low latency](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=1f7e7b1a-c60d-4783-a00e-56ca07043cb2&clip=0&mode=live&start=66.96471428571428) [create, read, update, and delete](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=1f7e7b1a-c60d-4783-a00e-56ca07043cb2&clip=0&mode=live&start=70.059) [operations. You will understand the basic](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=1f7e7b1a-c60d-4783-a00e-56ca07043cb2&clip=0&mode=live&start=72.47899999999998) [data model of Firestore where documents](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=1f7e7b1a-c60d-4783-a00e-56ca07043cb2&clip=0&mode=live&start=74.306) [help model hierarchal relationships.](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=1f7e7b1a-c60d-4783-a00e-56ca07043cb2&clip=0&mode=live&start=76.65999999999998) [Documents are stored in collections, which](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=1f7e7b1a-c60d-4783-a00e-56ca07043cb2&clip=0&mode=live&start=79.475) [are top-level containers, and can also](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=1f7e7b1a-c60d-4783-a00e-56ca07043cb2&clip=0&mode=live&start=81.61925) [contain subcollections. Documents can be](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=1f7e7b1a-c60d-4783-a00e-56ca07043cb2&clip=0&mode=live&start=84.65360000000001) [made up of arbitrary field-value pairs. We](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=1f7e7b1a-c60d-4783-a00e-56ca07043cb2&clip=0&mode=live&start=86.48085714285716) [will see examples of how Firestore can](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=1f7e7b1a-c60d-4783-a00e-56ca07043cb2&clip=0&mode=live&start=89.1935) [keep data in client applications synced in](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=1f7e7b1a-c60d-4783-a00e-56ca07043cb2&clip=0&mode=live&start=91.346) [real time. Next, we will study how you can](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=1f7e7b1a-c60d-4783-a00e-56ca07043cb2&clip=0&mode=live&start=94.07244444444444) [secure data stored on Cloud Firestore.](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=1f7e7b1a-c60d-4783-a00e-56ca07043cb2&clip=0&mode=live&start=97.089) [We'll focus on security rules, which](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=1f7e7b1a-c60d-4783-a00e-56ca07043cb2&clip=0&mode=live&start=99.999) [allows a very granular specification of](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=1f7e7b1a-c60d-4783-a00e-56ca07043cb2&clip=0&mode=live&start=102.13116666666666) [how data can be accessed from mobile and](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=1f7e7b1a-c60d-4783-a00e-56ca07043cb2&clip=0&mode=live&start=104.33825) [web client applications. Finally, we'll](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=1f7e7b1a-c60d-4783-a00e-56ca07043cb2&clip=0&mode=live&start=106.80375000000001) [study the original real-time database](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=1f7e7b1a-c60d-4783-a00e-56ca07043cb2&clip=0&mode=live&start=109.24239999999999) [offering on Firebase, the Realtime](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=1f7e7b1a-c60d-4783-a00e-56ca07043cb2&clip=0&mode=live&start=111.6042) [Database. This is a mature and robust](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=1f7e7b1a-c60d-4783-a00e-56ca07043cb2&clip=0&mode=live&start=114.39433333333332) [product that has been serving production](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=1f7e7b1a-c60d-4783-a00e-56ca07043cb2&clip=0&mode=live&start=116.70725)[traffic for several years. This database](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=1f7e7b1a-c60d-4783-a00e-56ca07043cb2&clip=0&mode=live&start=118.63866666666668) [also allows real-time updates, and stores](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=1f7e7b1a-c60d-4783-a00e-56ca07043cb2&clip=0&mode=live&start=121.05466666666666) [data in the form of a JSON tree. At the](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=1f7e7b1a-c60d-4783-a00e-56ca07043cb2&clip=0&mode=live&start=123.27785714285714) [end of this course, you will have all the](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=1f7e7b1a-c60d-4783-a00e-56ca07043cb2&clip=0&mode=live&start=126.59633333333333) [knowledge and skills needed to leverage](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=1f7e7b1a-c60d-4783-a00e-56ca07043cb2&clip=0&mode=live&start=128.8582857142857) [the right real-time database for your use](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=1f7e7b1a-c60d-4783-a00e-56ca07043cb2&clip=0&mode=live&start=130.744) [case, and you'll be able to structure data](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=1f7e7b1a-c60d-4783-a00e-56ca07043cb2&clip=0&mode=live&start=132.70450000000002) [within this database based on best](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=1f7e7b1a-c60d-4783-a00e-56ca07043cb2&clip=0&mode=live&start=135.2162) [practices for low latency and high performance.](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=1f7e7b1a-c60d-4783-a00e-56ca07043cb2&clip=0&mode=live&start=137.7902857142857)

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Cloud](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=0&mode=live&start=4.409) [Firestore on the GCP is a highly](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=0&mode=live&start=7.51025)[performant and scalable NoSQL service. It](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=0&mode=live&start=9.92) [offers very low latencies for CRUD](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=0&mode=live&start=13.998571428571429) [operations, create, read, update, and](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=0&mode=live&start=16.3) [delete of document-oriented data.](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=0&mode=live&start=19.2272) [Firestore is NoSQL, which means the kind](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=0&mode=live&start=21.608) [of data that you store within it is not](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=0&mode=live&start=24.675) [relational data, it's optimized for](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=0&mode=live&start=26.532) [document data and for hierarchal queries.](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=0&mode=live&start=28.233) [Documents in Cloud Firestore have fields](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=0&mode=live&start=32.076) [which are key-value pairs, and can have an](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=0&mode=live&start=34.914) [arbitrary level of nesting. The original](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=0&mode=live&start=37.094)[NoSQL database offered on the GCP was](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=0&mode=live&start=39.96142857142857) [Cloud Datastore, which was closely](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=0&mode=live&start=42.882000000000005) [integrated with the App Engine Platform as](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=0&mode=live&start=45.162) [a Service offering. Cloud Firestore is](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=0&mode=live&start=47.905249999999995) [similar to Datastore, and its anointed](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=0&mode=live&start=50.28300000000001) [successor. Firestore is not related to App](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=0&mode=live&start=53.652249999999995) [Engine specifically, but instead is a part](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=0&mode=live&start=56.603) [of the Firebase mobile and app development](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=0&mode=live&start=58.60625000000002) [platform offered by Google. Firestore is](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=0&mode=live&start=61.54) [highly scalable and highly performant. The](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=0&mode=live&start=64.257) [performance of reads on Firestore scales](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=0&mode=live&start=67.112) [independent of the size of data that you](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=0&mode=live&start=69.76766666666668) [store within this database. The trade-off](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=0&mode=live&start=73.23899999999999) [here is that Firestore limits the kind of](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=0&mode=live&start=75.45185714285715) [queries that you can perform on the](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=0&mode=live&start=77.59466666666667) [underlying data. It has a very distinctive](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=0&mode=live&start=79.497) [data model where you have collections made](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=0&mode=live&start=81.91087499999999) [up of documents, and you can have nested subcollections within documents.](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=0&mode=live&start=84.36371428571427)

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[Before we dive into actual course content,](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=1&mode=live&start=0.75) [let's take a look at some of the prereqs](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=1&mode=live&start=3.385) [that you need to have in order to make the](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=1&mode=live&start=5) [most of your learning. This course assumes](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=1&mode=live&start=6.532) [that you're familiar with cloud computing](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=1&mode=live&start=9.180500000000002) [platforms. You know how to provision](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=1&mode=live&start=11.575) [resources on the cloud, and how to](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=1&mode=live&start=13.262375)[integrate with cloud-based services. All](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=1&mode=live&start=15.280999999999999) [of the demos in this course are written in](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=1&mode=live&start=18.05366666666667) [JavaScript using the Node.js library, so](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=1&mode=live&start=20.640333333333334) [you should be familiar with working with](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=1&mode=live&start=23.860750000000003) [web applications using JavaScript and](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=1&mode=live&start=25.217) [Node.js. If you feel that you don't have](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=1&mode=live&start=28.369500000000006) [the required prereqs for this course, here](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=1&mode=live&start=30.493624999999994) [are some other courses on Pluralsight that](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=1&mode=live&start=32.716571428571434) [you can watch first. 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Security rules and conditions](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=1&mode=live&start=81.64033333333334) [can be specified in a very granular manner](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=1&mode=live&start=83.54933333333335) [in order to allow very specific kinds of](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=1&mode=live&start=86.819) [access to the datastore in Cloud Firestore](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=1&mode=live&start=89.471) [to our client apps. 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We'll study](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=1&mode=live&start=104.481) [the JSON structure of the data stored in](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=1&mode=live&start=107.29775000000001) [the Realtime Database, study its features](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=1&mode=live&start=110.063) [and functionality, see how we can perform](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=1&mode=live&start=112.61299999999999) [CRUD operations and set up realtime](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=1&mode=live&start=115.17057142857142) [listeners. 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They see huge](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=1&mode=live&start=128.917) [variations in user traffic on sale days,](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=1&mode=live&start=130.862) [which is why they're considering a move to](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=1&mode=live&start=133.857) [the GCP. A cloud computing platform fits](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=1&mode=live&start=135.847) [their bill perfectly. They want](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=1&mode=live&start=139.199) [pay-as-you-go functionality, and don't](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=1&mode=live&start=141.51950000000002) [want to hold idle capacity during off-sale periods.](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=1&mode=live&start=143.52000000000004)

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[Before we get hands-on with the demos,](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=2&mode=live&start=0.75) [let's understand what exactly Cloud](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=2&mode=live&start=2.464) [Firestore is all about. It's a flexible,](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=2&mode=live&start=4.349) [scalable, NoSQL database for keeping data](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=2&mode=live&start=7.539) [in sync across client applications. At the](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=2&mode=live&start=9.984285714285711) [time this course was recorded, this](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=2&mode=live&start=13.237857142857141) [product was in beta. Cloud Firestore is a](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=2&mode=live&start=15.1758) [serverless offering on the GCP, which](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=2&mode=live&start=19.026999999999997) [means you don't have to provision](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=2&mode=live&start=20.63033333333334) [resources or infrastructure in order to](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=2&mode=live&start=22.0548) [use this NoSQL database. As a NoSQL](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=2&mode=live&start=25.208333333333336)[database, data in Firestore is stored in](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=2&mode=live&start=28.509999999999998) [the form of documents. It's a](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=2&mode=live&start=30.583333333333332) [document-oriented data model with powerful](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=2&mode=live&start=32.571999999999996) [querying capabilities. All of the fields](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=2&mode=live&start=35.07333333333333) [in your document are indexed by default,](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=2&mode=live&start=37.557500000000005) [which means retrieval of documents by](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=2&mode=live&start=39.6045) [field is very, very fast. There are native](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=2&mode=live&start=42.17400000000001) [SDKs available for Web Apps, Android, and](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=2&mode=live&start=45.37114285714285) [iOS applications for Cloud Firestore. You](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=2&mode=live&start=47.8535) [can also access Cloud Firestore from a](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=2&mode=live&start=50.327999999999996) [programming language of your choice.](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=2&mode=live&start=53.11166666666666)[Node.js, Python, and Go are all supported.](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=2&mode=live&start=55.12285714285714) [The Firestore data model is fairly unusual](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=2&mode=live&start=58.492) [and we'll study it in much more detail in](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=2&mode=live&start=60.928) [a later clip. The data model has a](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=2&mode=live&start=62.862) [hierarchal structure, and at the very top](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=2&mode=live&start=65.281) [of the hierarchy lies collections.](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=2&mode=live&start=67.121) [Collections are made up of individual](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=2&mode=live&start=69.399) [documents, and within a document you have](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=2&mode=live&start=71.333) [keys and values, which are field](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=2&mode=live&start=74.21) [specifications for a particular document.](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=2&mode=live&start=76.875) [Every document can be identified by a](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=2&mode=live&start=79.25) [unique ID. This ID can be automatically](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=2&mode=live&start=81.494) [generated by Firestore, or you can specify](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=2&mode=live&start=85.048) [a unique ID Of your choice. 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Within that we have](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=2&mode=live&start=95.891) [documents for user01 and 02, and within](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=2&mode=live&start=98.35657142857144) [each document we have field specifications](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=2&mode=live&start=100.53800000000001) [for individual users. Field in Firestore](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=2&mode=live&start=103.0592) [support a number of different data types.](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=2&mode=live&start=106.1552857142857) [You can have simple primitive values such](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=2&mode=live&start=108.565)[as strings, floating points, and integer](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=2&mode=live&start=111.111) [values. You can also have your fields be](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=2&mode=live&start=113.57375) [complex, nested objects such as maps,](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=2&mode=live&start=116.61657142857145) [which have key value specifications within](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=2&mode=live&start=119.06450000000001) [the map field. You can also have](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=2&mode=live&start=121.447) [subcollections within documents.](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=2&mode=live&start=124.65228571428574) [Subcollections are a way to specify a](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=2&mode=live&start=126.325) [collection of documents within an outer](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=2&mode=live&start=128.146) [document. In this way, you can nest your](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=2&mode=live&start=130.72) [documents in a hierarchal manner.](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=2&mode=live&start=133.63750000000005) [Firestore supports very powerful querying](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=2&mode=live&start=135.717)[functionality, and it offers very low](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=2&mode=live&start=138.352) [latencies. 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You can also sort](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=2&mode=live&start=151.822) [your results based on a particular field.](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=2&mode=live&start=154.61722222222218) [You can include multiple chained filters](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=2&mode=live&start=156.64033333333333) [with different field specifications.](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=2&mode=live&start=159.77499999999998) [Everything that you store within Cloud](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=2&mode=live&start=162.403) [Firestore is indexed by default. All of](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=2&mode=live&start=164.243) [your documents are indexed, which means](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=2&mode=live&start=167.13233333333335) [you can retrieve documents by ID very](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=2&mode=live&start=169.03585714285717) [quickly. There are also default indexes on](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=2&mode=live&start=171.272) [each key, or each field within a document.](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=2&mode=live&start=173.84885714285713) [The huge performance benefit in using](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=2&mode=live&start=177.052) [Cloud Firestore is the fact that your](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=2&mode=live&start=179.30371428571434) [query performance is proportional to the](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=2&mode=live&start=181.63157142857145) [result set. This means that if you](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=2&mode=live&start=184.54557142857138) [retrieve 100 results using a particular](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=2&mode=live&start=187.245375) [query, your performance will not change](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=2&mode=live&start=189.32925) [whether there are 100 records in your](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=2&mode=live&start=191.813) [database or a million. Firestore also](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=2&mode=live&start=194.032) [enables high performance by allowing you](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=2&mode=live&start=196.2082) [to specify shallow queries to retrieve](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=2&mode=live&start=198.64385714285714) [data for individual documents. 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You can configure very granular](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=2&mode=live&start=255.92228571428572) [security rules on your data, in order to](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=2&mode=live&start=258.40433333333334) [control access from client applications.](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=2&mode=live&start=261.62785714285707) [These applications can be JavaScript apps,](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=2&mode=live&start=263.3394) [Android, or iOS apps. 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Click on the hamburger icon, and](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=3&mode=live&start=45.89011111111113) [under Storage go to Cloud Firestore. Click](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=3&mode=live&start=48.35371428571429) [on Data in the submenu here, and you'll be](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=3&mode=live&start=51.63971428571429) [presented with three options, Cloud](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=3&mode=live&start=54.842857142857135) [Datastore, Cloud Firestore in Datastore](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=3&mode=live&start=56.7988) [mode, and Cloud Firestore in Native mode.](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=3&mode=live&start=58.710499999999996) [Now, the original NoSQL database that was](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=3&mode=live&start=61.785000000000004) [to be used on the Google Cloud Platform](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=3&mode=live&start=64.45333333333333) [was Cloud Datastore, however, Cloud](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=3&mode=live&start=66.896) [Firestore is where the future is, and](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=3&mode=live&start=68.98033333333335) [slowly Cloud Datastore clients are going](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=3&mode=live&start=71.75599999999999) [to be moved over to Cloud Firestore in](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=3&mode=live&start=73.475875) [Datastore mode. 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Cloud](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=3&mode=live&start=191.0217142857143) [Firestore automatically sets up single](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=3&mode=live&start=193.2602) [field indexes on all of your documents. 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This means that all](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=3&mode=live&start=212.246) [comparison operations, such as less than,](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=3&mode=live&start=215.213) [less than equal to, double equal to, and](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=3&mode=live&start=217.05349999999996) [so on, these clauses are supported on all](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=3&mode=live&start=219.32666666666665) [fields by default. 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As an app](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=4&mode=live&start=10.229) [developer, you don't want to deal with](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=4&mode=live&start=12.761666666666665) [infrastructure and provisioning resources,](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=4&mode=live&start=14.485) [which is why the Firebase app development](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=4&mode=live&start=16.190142857142856) [platform is what you'll turn to. Firebase](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=4&mode=live&start=18.505) [is a distinct offering from the GCP, or](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=4&mode=live&start=21.048142857142857) [the Google Cloud Platform, but there are a](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=4&mode=live&start=23.865) [few integrations between the two, and](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=4&mode=live&start=26.17928571428572) [there are some services and products which](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=4&mode=live&start=27.739875000000005) [are common. There are a few common](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=4&mode=live&start=30.036499999999997) [elements between the GCP and Firebase.](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=4&mode=live&start=32.53437499999999) [Products such as Cloud Storage buckets and](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=4&mode=live&start=34.87442857142858) [Cloud Firestore are offered across both](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=4&mode=live&start=38.087999999999994) [platforms. Both use projects where you](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=4&mode=live&start=40.800250000000005) [have to explicitly enable a project for](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=4&mode=live&start=42.58599999999999) [Firebase integration. Both of these offer](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=4&mode=live&start=44.91549999999999) [consolidated billing across Firebase, as](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=4&mode=live&start=47.666) [well as the GCP. You use the same kind of](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=4&mode=live&start=50.039) [access control and identity and access](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=4&mode=live&start=52.84225000000002) [management. The terms of service are the](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=4&mode=live&start=55.209199999999996) [same, and the concept of accounts are the](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=4&mode=live&start=57.18585714285716) [same as well. You'll use a G Suite or a](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=4&mode=live&start=59.96139999999999) [Gmail account to log into the GCP. You'll](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=4&mode=live&start=62.6765) [use the same for Firebase. So why does](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=4&mode=live&start=65.15016666666666) [Google have two separate platforms? This](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=4&mode=live&start=68.544625) [is because the objectives of both are](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=4&mode=live&start=70.69925) [different, and the target audience is also](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=4&mode=live&start=72.906) [different. The objective of Firebase is to](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=4&mode=live&start=75.39187500000001)[allow developers to build mobile and web](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=4&mode=live&start=77.6652857142857) [applications very, very quickly, whereas](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=4&mode=live&start=80.282) [for the GCP it is to make Google's](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=4&mode=live&start=82.56422222222221) [infrastructure publicly available in the](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=4&mode=live&start=85.182) [form of services. The Firebase platform is](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=4&mode=live&start=86.748) [primarily used by client-side application](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=4&mode=live&start=90.0962) [developers, either of web apps or mobile](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=4&mode=live&start=92.33266666666667) [apps on Android or iOS. The main users of](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=4&mode=live&start=95.05557142857144) [the GCP are server-side and backend](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=4&mode=live&start=98.16649999999998) [developers. The services and products that](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=4&mode=live&start=100.68533333333333) [Firebase offers are used to build](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=4&mode=live&start=103.15416666666664) [applications quickly, engage, and grow](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=4&mode=live&start=105.46183333333336) [users, whereas GCP services focus on](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=4&mode=live&start=108.09620000000002) [leveraging Google's code infrastructure,](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=4&mode=live&start=110.67799999999998) [such as VMs, networks, and so on. On](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=4&mode=live&start=112.4075) [Firebase, you'll find the Realtime](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=4&mode=live&start=116.14966666666666) [Database, as well as Cloud Firestore,](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=4&mode=live&start=118.258) [crashlytics to track and manage your app](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=4&mode=live&start=121.081) [crashes, performance management tools, as](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=4&mode=live&start=123.4272) [well as messaging tools. On the GCP,](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=4&mode=live&start=125.5636) [you'll find networking infrastructure,](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=4&mode=live&start=128.001) [storage, machine learning, traffic](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=4&mode=live&start=129.65175)[management, and scaling infrastructure. On](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=4&mode=live&start=131.99939999999998) [Firebase, you'll find that the products](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=4&mode=live&start=134.67514285714284) [and services are geared towards helping](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=4&mode=live&start=136.704) [you build your application very quickly,](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=4&mode=live&start=138.2837142857142) [whether it's an Android, iOS, Web App, C++](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=4&mode=live&start=140.583) [or Unity application. Some of the product](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=4&mode=live&start=143.6815) [offerings here are Cloud Firestore for](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=4&mode=live&start=146.6942857142857) [Realtime Database updates, an ML Toolkit,](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=4&mode=live&start=148.9472) [Cloud Functions for serverless compute,](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=4&mode=live&start=152.393) [authentication, hosting, storage](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=4&mode=live&start=154.614) [solutions, and the Realtime Database as](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=4&mode=live&start=156.576) [well. You'll also find products and](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=4&mode=live&start=159.06166666666664) [services that help you improve your](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=4&mode=live&start=160.87085714285715) [application's performance. You can track](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=4&mode=live&start=163.14733333333336) [your app crashes using crashlytics, you](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=4&mode=live&start=165.03157142857143) [have performance monitoring tools, and you](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=4&mode=live&start=167.4015) [have a Test Lab where you can test out](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=4&mode=live&start=169.85100000000006) [various scenarios, such as A/B testing,](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=4&mode=live&start=172.56)[and so on. And finally, you have products](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=4&mode=live&start=174.32571428571424) [and services which focus on growth. Here](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=4&mode=live&start=176.9328571428572) [is where like cloud messaging, dynamic](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=4&mode=live&start=179.69883333333334) [linking outside of your applications,](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=4&mode=live&start=182.114) [analytics, invites, and so on. As an app](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=4&mode=live&start=184.11683333333332) [developer focused on building applications](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=4&mode=live&start=188.26957142857145) [rather than managing infrastructure,](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=4&mode=live&start=189.88775) [you'll work with Firebase rather than the GCP directly.](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=4&mode=live&start=191.0676)

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[Firestore Data Model](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=6&mode=live)

[Now that we have a little bit of](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=6&mode=live&start=0.4) [experience working with Cloud Firestore,](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=6&mode=live&start=2.383111111111111) [let's understand its data model in some](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=6&mode=live&start=4.043) [detail. We already know that Datastore and](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=6&mode=live&start=6.8403750000000025) [Cloud Firestore is in the form of](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=6&mode=live&start=9.350285714285713) [collections made up of documents.](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=6&mode=live&start=11.120571428571433) [Documents have keys and values within](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=6&mode=live&start=12.808) [them, these are the fields within a](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=6&mode=live&start=15.112000000000002) [document, and every document can be](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=6&mode=live&start=17.33971428571429) [identified using a unique ID that can be](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=6&mode=live&start=19.579142857142852) [auto-generated or user assigned. Here is](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=6&mode=live&start=22.308000000000003) [an example of a collection of user data](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=6&mode=live&start=25.22988888888889) [stored in documents in Cloud Firestore.](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=6&mode=live&start=28.057714285714287) [Let's now take a detailed look at how this](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=6&mode=live&start=30.936) [data is structured. Users here at the very](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=6&mode=live&start=32.677) [top represent a collection. This is a](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=6&mode=live&start=35.8886) [collection of user data, and within this](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=6&mode=live&start=38.85828571428572) [collection we have documents with unique](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=6&mode=live&start=40.855999999999995) [IDs. Each of these documents represents an](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=6&mode=live&start=43.302499999999995) [individual user within the user](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=6&mode=live&start=46.03) [collection. The document IDs in this](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=6&mode=live&start=48.828333333333326) [example are user01 and user02. Now, within](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=6&mode=live&start=51.05299999999999) [each document, data is represented in the](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=6&mode=live&start=54.696000000000005) [form of fields. Fields can be thought of](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=6&mode=live&start=57.72549999999998) [as key value pairs. Name is the key, Jane](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=6&mode=live&start=60.40333333333333) [Smith is the value. Now in Cloud Firestore](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=6&mode=live&start=63.63377777777779) [it's not necessary that every document](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=6&mode=live&start=66.27200000000002) [within a collection have the same set of](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=6&mode=live&start=68.31900000000002) [fields or key value pairs. The key value](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=6&mode=live&start=71.22400000000002) [pairs can be different. For example, we](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=6&mode=live&start=73.54814285714286) [have a field named phone for user02, but](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=6&mode=live&start=75.56025) [that's not available for user01. In](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=6&mode=live&start=78.81737500000001) [summary, documents in Cloud Firestore](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=6&mode=live&start=81.5145)[belong to collections, and are the basic](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=6&mode=live&start=84.097) [unit of storage. Documents can be thought](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=6&mode=live&start=86.344) [of as a lightweight record, which within](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=6&mode=live&start=88.331) [them contain fields and corresponding](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=6&mode=live&start=91.308) [values for these fields. So](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=6&mode=live&start=93.3826) [interchangeably I'll be using keys or](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=6&mode=live&start=95.31814285714286) [fields, though fields is a more common](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=6&mode=live&start=97.269) [term. Firestore has rich support for](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=6&mode=live&start=100.51087500000004) [different kinds of data, so values can be](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=6&mode=live&start=102.77900000000002) [simple data types such as numbers, floats,](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=6&mode=live&start=105.14112500000003) [or integers, strings, and so on. They can](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=6&mode=live&start=107.935) [also be complex data types such as maps or](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=6&mode=live&start=110.86057142857142) [arrays. And every document within a](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=6&mode=live&start=113.87999999999998) [collection is identified by a unique ID](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=6&mode=live&start=116.22199999999998) [that can be used to retrieve that specific](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=6&mode=live&start=118.43800000000003) [document. Documents in Cloud Firestore are](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=6&mode=live&start=122.17959999999998) [not standalone. Documents can only live](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=6&mode=live&start=124.54983333333331) [within collections, and collections can](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=6&mode=live&start=127.04433333333331) [contain only documents, not other](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=6&mode=live&start=129.9644) [collections. So collections are containers](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=6&mode=live&start=132.86620000000005) [for documents. They can't directly contain](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=6&mode=live&start=135.19733333333338) [raw fields with values. You can't nest one](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=6&mode=live&start=138.141) [collection within another collection, so a](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=6&mode=live&start=142.03400000000005) [collection cannot contain other](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=6&mode=live&start=144.30966666666671) [collections directly, and all documents](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=6&mode=live&start=146.048) [that are present within a collection are](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=6&mode=live&start=147.82557142857144) [unique, and can be uniquely identified](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=6&mode=live&start=149.64171428571424) [using their ID. Cloud Firestore is a](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=6&mode=live&start=151.87599999999998) [hierarchal document store, though, and](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=6&mode=live&start=155.21466666666663) [this hierarchy is provided by using](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=6&mode=live&start=157.1725) [subcollections. Subcollections are](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=6&mode=live&start=160.23825) [collections of documents contained within](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=6&mode=live&start=161.8982) [an outer document, not within an outer](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=6&mode=live&start=164.4214) [collection. Subcollections contain only](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=6&mode=live&start=167.58160000000004) [documents nested within this outer](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=6&mode=live&start=170.2615) [document, and subcollections, just like](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=6&mode=live&start=172.37639999999996) [collections, cannot directly contain raw](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=6&mode=live&start=174.428)[fields with values. Don't worry if this](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=6&mode=live&start=176.99142857142851) [seems a little confusing. Just remember](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=6&mode=live&start=179.47650000000002) [these two rules. Documents can contain](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=6&mode=live&start=181.13440000000003) [subcollections. Collections or](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=6&mode=live&start=184.4305)[subcollections can contain only documents,](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=6&mode=live&start=186.12040000000002) [and this is how you nest your data or form](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=6&mode=live&start=188.153) [a hierarchy of data. Subcollections](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=6&mode=live&start=191.31700000000006) [support all of the querying capabilities that apply to route-level collections.](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=6&mode=live&start=193.1745)

[Writing Data to Firestore Using a Node.js Client](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=7&mode=live)

[In this demo, we'll see how we can work](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=7&mode=live&start=1) [with Cloud Firestore using a web](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=7&mode=live&start=2.412) [application written in Node.js. We'll see](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=7&mode=live&start=5.181) [how we can write data to Firestore, and](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=7&mode=live&start=7.84325) [work with collections and subcollections.](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=7&mode=live&start=9.495) [I start this demo off in the terminal](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=7&mode=live&start=12.773) [window of my local machine. I already have](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=7&mode=live&start=14.966) [Node.js installed. The Node version that I](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=7&mode=live&start=17.770599999999998) [have on my machine is v8.11 .3. If you](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=7&mode=live&start=19.829111111111114) [don't have Node and NPM installed, simply](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=7&mode=live&start=23.133499999999994) [head over to www.nodejs .org and get set](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=7&mode=live&start=26.245800000000003) [up. We'll first use the Node Package](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=7&mode=live&start=30.92383333333334) [Manager, or NPM, in order to get set up](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=7&mode=live&start=33.92114285714285) [with the Firebase SDK. Call sudo npm](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=7&mode=live&start=36.356200000000015) [install -g firebase tools. This will get](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=7&mode=live&start=40.05285714285714) [you set up not only with the Firebase SDK,](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=7&mode=live&start=42.84912500000001) [but also with the Firebase command line](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=7&mode=live&start=45.904) [interface. Once you have Firebase](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=7&mode=live&start=49.478374999999986) [installed, I'm going to create a directory](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=7&mode=live&start=51.384199999999986) [where I'm going to write my code. I'll](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=7&mode=live&start=53.31775) [call this the spikey\_firestore directory,](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=7&mode=live&start=55.223000000000006) [and I'll cd into it. So I'm currently in](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=7&mode=live&start=57.1045)[spikey\_firestore, and here is where I'll](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=7&mode=live&start=60.3416) [write my node files. In order to use](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=7&mode=live&start=62.22122222222221) [Firestore or any other service from the](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=7&mode=live&start=64.68550000000002) [Firebase platform, you need to](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=7&mode=live&start=67.17520000000002)[authenticate yourself to your Firebase](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=7&mode=live&start=68.82757142857142) [project using your user credentials, which](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=7&mode=live&start=70.3336) [in our case is spikeysales@ loonycorn.com.](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=7&mode=live&start=72.54333333333332) [Call firebase.login, and walk through the](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=7&mode=live&start=76.202) [authentication procedure. I say yes so](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=7&mode=live&start=78.66) [that Firebase can collect anonymous CLI](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=7&mode=live&start=82.401) [usage. This will give me a link. Click on](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=7&mode=live&start=84.83633333333334) [this link that will bring up an](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=7&mode=live&start=87.237) [authentication page. Once you've signed in](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=7&mode=live&start=88.63) [with your GCP user credentials, you can go](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=7&mode=live&start=91.69800000000001) [ahead and allow the Firebase command line](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=7&mode=live&start=94.14849999999998) [interface to access your GCP project](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=7&mode=live&start=96.56200000000001) [resources. You have now successfully](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=7&mode=live&start=100.2175) [logged into Firebase using the command](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=7&mode=live&start=101.91300000000001) [line interface. Let's head back, and you](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=7&mode=live&start=104.06933333333333) [can see the same success message here. I'm](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=7&mode=live&start=105.91333333333334) [now going to create a new JavaScript file](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=7&mode=live&start=108.651625) [using the nano text editor, which I'll use](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=7&mode=live&start=111.0475) [to perform CRUD, or create, read, update,](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=7&mode=live&start=114.2705) [and delete operations on Firestore.](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=7&mode=live&start=116.662) [Firestore\_crud.js is the name of my file.](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=7&mode=live&start=119.109) [Once you've installed Firebase tools, the](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=7&mode=live&start=123.165) [Firebase SDK comes along. In order to use](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=7&mode=live&start=125.411) [this within your Node.js project, you need](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=7&mode=live&start=127.88300000000002) [to require the Firebase library. The](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=7&mode=live&start=129.91685714285717) [library for Cloud Firestore is under](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=7&mode=live&start=132.37033333333335) [firebase/firestore. Go ahead and require](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=7&mode=live&start=136.321) [that as well. Next up, you need to specify](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=7&mode=live&start=138.38514285714285) [the config settings for your Firebase](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=7&mode=live&start=141.15199999999993)[project. These are the same configuration](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=7&mode=live&start=143.52919999999997) [settings that we copied over earlier from](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=7&mode=live&start=145.24483333333336) [our Firebase web console. These are config](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=7&mode=live&start=147.18700000000004) [settings that are unique to your project](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=7&mode=live&start=150.5007142857143) [and your login information, so make sure](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=7&mode=live&start=152.67571428571432) [you specify your information here. Next,](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=7&mode=live&start=155.04387500000004) [call firebase.initializeApp with these](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=7&mode=live&start=157.79225)[config settings in order to initialize the](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=7&mode=live&start=160.43566666666666) [firebase SDK. Your app is now ready to use](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=7&mode=live&start=163.0205) [Firebase and Firestore. You can get a](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=7&mode=live&start=166.27312499999994) [reference to the Firestore database by](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=7&mode=live&start=169.09399999999994) [simply calling firebase.firestore and](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=7&mode=live&start=171.11328571428567) [store it in the db variable. I'm now going](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=7&mode=live&start=172.60366666666664) [to write a very simple function to add a](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=7&mode=live&start=176.12500000000003) [single document to the users collection](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=7&mode=live&start=178.8481428571428) [that I had set up earlier, and you'll find](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=7&mode=live&start=180.45125000000007) [that this is very straightforward. You](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=7&mode=live&start=183.15499999999997) [simply access the collection by name,](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=7&mode=live&start=185.68342857142858)[db.collection users, and add the fields of](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=7&mode=live&start=187.756) [the document. Now in our specific case,](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=7&mode=live&start=191.46533333333335) [the users collection actually exists](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=7&mode=live&start=194.39) [within our database. If the collection](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=7&mode=live&start=195.86500000000007) [does not exist, when you add a document to](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=7&mode=live&start=197.6864285714285) [this collection, Firestore will](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=7&mode=live&start=200.39000000000004) [automatically create the collection](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=7&mode=live&start=202.74325000000002) [itself. This is implicit. 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Invoke the readDoc function,](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=9&mode=live&start=103.44314285714286) [save this file, and let's execute this on](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=9&mode=live&start=106.25) [our terminal window. And you can see that](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=9&mode=live&start=109.082) [all of the fields associated with this](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=9&mode=live&start=110.96333333333334) [document and their corresponding values,](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=9&mode=live&start=112.8215) [are printed out to screen. Let's continue](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=9&mode=live&start=114.93900000000001) [writing code in the same firestore\_crud.js](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=9&mode=live&start=117.94857142857141) [file, and this time we'll create a](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=9&mode=live&start=119.49783333333333) [function called readAllUsers, that allow](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=9&mode=live&start=122.58659999999999) [us to read multiple users in one go. Use](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=9&mode=live&start=124.91320000000002) [the Firestore database reference to access](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=9&mode=live&start=127.6735) [the users collection, and simply call get](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=9&mode=live&start=129.88925) [on the collection as a whole, instead of](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=9&mode=live&start=132.2746666666667) [on a single document. This will retrieve a](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=9&mode=live&start=134.57514285714285) [snapshot of all of the documents that are](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=9&mode=live&start=137.10849999999996) [currently present within our users](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=9&mode=live&start=139.59900000000002)[collection. And you can then call the](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=9&mode=live&start=141.43375) [forEach method on this snapshot to access](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=9&mode=live&start=144.14475) [the data for individual documents. 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Let's invoke the readAllUsers](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=9&mode=live&start=151.76511111111122) [function, hit Ctrl+X to save this file,](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=9&mode=live&start=154.7036) [and let's execute it using Node. And here](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=9&mode=live&start=157.347) [are the three user documents. 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You can doublecheck](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=9&mode=live&start=164.83399999999997) [them by heading over to the Firestore web](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=9&mode=live&start=166.53671428571428) [console. Once again, switch over to your](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=9&mode=live&start=169.46300000000005) [terminal window, and let's continue](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=9&mode=live&start=171.9425714285714) [editing the firestore\_crud.js file. This](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=9&mode=live&start=173.5473333333333) [time, we'll readAllRestaurants. 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Iterate over the](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=9&mode=live&start=183.65633333333332)[snapshot, and print out the name of each](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=9&mode=live&start=185.59914285714285) [restaurant. The data function will return](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=9&mode=live&start=188.7428) [all of the fields within each document. We](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=9&mode=live&start=190.54199999999994) [simply want to access the name field.](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=9&mode=live&start=193.676125) [Invoke this method. Make sure that you](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=9&mode=live&start=197.037) [comment out all other methods that you've](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=9&mode=live&start=198.742) [invoked so far, so we only see the results](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=9&mode=live&start=200.47099999999998) [of readAllRestaurants. 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We've seen create,](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=9&mode=live&start=212.116) [read, update. Now it's time for delete.](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=9&mode=live&start=215.4974) [Comment out all other function](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=9&mode=live&start=217.774) [invocations, and create a new function](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=9&mode=live&start=220.00483333333335) [called deleteUserDoc. 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You can execute](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=10&mode=live&start=5.971) [a number of read, as well as write](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=10&mode=live&start=8.448857142857143) [operations on one or more documents, and](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=10&mode=live&start=10.756000000000002) [they will be executed as an atomic unit.](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=10&mode=live&start=12.5055) [All of the operations will be run on your](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=10&mode=live&start=15.808) [database, or none at all. Firestore also](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=10&mode=live&start=17.681) [has support for batched write operations.](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=10&mode=live&start=20.872999999999998) [This is extremely useful if you want to](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=10&mode=live&start=23.404333333333334) [perform a huge number of updates across](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=10&mode=live&start=26.175888888888895) [multiple documents, and you want to do so](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=10&mode=live&start=28.8795) [in a single write operation. Let's first](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=10&mode=live&start=32.14845454545454) [study the kind of transaction support that](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=10&mode=live&start=34.348571428571425) [Firestore has to offer. Transactions allow](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=10&mode=live&start=36.396) [you to group multiple operations into a](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=10&mode=live&start=38.54266666666666) [single transaction. The transaction will](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=10&mode=live&start=41.645599999999995) [run in its entirety. Transactions never](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=10&mode=live&start=43.82742857142858)[partially apply read or write operations.](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=10&mode=live&start=46.3328) [When you specify the set of operations](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=10&mode=live&start=49.258) [that need to run within a transaction, you](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=10&mode=live&start=51.08) [have to ensure that all of your reads](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=10&mode=live&start=53.45725) [precede your write operations. The](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=10&mode=live&start=56.3168) [transaction function might be executed](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=10&mode=live&start=58.9456) [more than once. If a concurrent edit](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=10&mode=live&start=60.7975) [affects a document that the transaction](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=10&mode=live&start=63.371714285714276) [reads, then the transaction will be](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=10&mode=live&start=65.404) [executed again. Firestore has this](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=10&mode=live&start=67.85599999999997) [powerful feature where transactions are](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=10&mode=live&start=69.71899999999998) [re-executed until they're finally](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=10&mode=live&start=71.67719999999998) [committed. There are a number of reasons](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=10&mode=live&start=73.42357142857142) [why a transaction that you execute might](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=10&mode=live&start=75.75666666666666) [fail. If you specify read operations after](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=10&mode=live&start=77.77966666666666) [write operations, that is one reason for](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=10&mode=live&start=80.185) [failure, or if you read a document that](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=10&mode=live&start=82.975) [was modified outside of the transaction.](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=10&mode=live&start=85.20699999999997) [That's another reason that a transaction](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=10&mode=live&start=88.063) [might fail. Or if the size of your](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=10&mode=live&start=89.857) [transaction exceeds the maximum request](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=10&mode=live&start=92.345) [size. Transactions can only be executed](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=10&mode=live&start=96.07083333333331) [when your device or app is online and](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=10&mode=live&start=98.8385) [connected. Transactions cannot be executed](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=10&mode=live&start=101.48562499999998) [in the offline mode. Batched writes are](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=10&mode=live&start=103.01733333333335) [another useful feature in Cloud Firestore.](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=10&mode=live&start=106.17466666666668)[Let's quickly take a look at what batched](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=10&mode=live&start=108.47) [writes have to offer. This is way for you](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=10&mode=live&start=110.8214) [to execute multiple write operations as a](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=10&mode=live&start=113.710625) [single batch. All of these writes are](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=10&mode=live&start=116.33933333333334) [executed, or none at all. These writes](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=10&mode=live&start=118.45450000000001) [complete atomically, and can write to](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=10&mode=live&start=120.84657142857145) [multiple documents in multiple](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=10&mode=live&start=123.19333333333333) [collections. The ability to batch write](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=10&mode=live&start=125.09025000000001) [operations is extremely useful when you're](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=10&mode=live&start=127.61500000000001) [migrating large datasets to Cloud](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=10&mode=live&start=129.89916666666667) [Firestore. Batched writes can contain up](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=10&mode=live&start=132.6382) [to 500 operations, and there are fewer](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=10&mode=live&start=135.2725714285715) [failure cases as compared with](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=10&mode=live&start=138.43166666666667) [transactions. If you want to perform write](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=10&mode=live&start=140.54480000000004) [operations atomically, and do not need](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=10&mode=live&start=143.3174285714285)[reads, it's preferable to use a batched write rather than a transaction.](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=10&mode=live&start=146.16100000000006)

[Batch Operations](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=11&mode=live)

[If you have a large number of updates to](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=11&mode=live&start=0.75) [make across different documents on Cloud](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=11&mode=live&start=2.784) [Firestore, you'll perform a batch](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=11&mode=live&start=4.921) [operation. Let's see how to do that in](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=11&mode=live&start=6.990166666666665) [this demo. We'll write code for batch](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=11&mode=live&start=9.339888888888888) [operations in a new file called](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=11&mode=live&start=11.318000000000001) [batched\_ops.js. Open it up using the nano](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=11&mode=live&start=14.319500000000001) [editor. Set up the required statements for](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=11&mode=live&start=16.946428571428573) [the Firebase SDK and for the Firestore](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=11&mode=live&start=18.500142857142848) [library within this SDK. Specify the](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=11&mode=live&start=21.309142857142856) [config parameters that you copied over](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=11&mode=live&start=24.175499999999996) [from the Firebase web console, and](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=11&mode=live&start=25.978428571428573) [initialize your Firebase SDK. These are](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=11&mode=live&start=28.110333333333333) [the same series of steps that you need to](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=11&mode=live&start=30.712999999999997) [perform each time you use the Firebase SDK](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=11&mode=live&start=33.48100000000001) [within your app. Initialize and get a](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=11&mode=live&start=36.37624999999999) [reference to the Firestore database by](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=11&mode=live&start=38.75085714285716) [calling firebase.firestore. The next step](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=11&mode=live&start=41.012750000000004) [here is settings for our database. These](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=11&mode=live&start=44.754) [are some specific settings that you'll](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=11&mode=live&start=47.16266666666667) [need to specify in order to avoid the use](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=11&mode=live&start=48.875) [of deprecated features. Earlier,](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=11&mode=live&start=51.4344) [timestamps in Firestore used to be treated](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=11&mode=live&start=53.416) [as system Date objects, but now we want](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=11&mode=live&start=55.96657142857142) [these timestamps to be read back as](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=11&mode=live&start=58.532500000000006) [Firebase timestamp objects. That's why we](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=11&mode=live&start=61.436499999999995) [specify these settings. Get a reference](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=11&mode=live&start=63.94599999999999) [for the restaurants collection that we](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=11&mode=live&start=66.16799999999999) [already have stored within our Firestore](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=11&mode=live&start=68.356) [and let's perform some batched write](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=11&mode=live&start=70.2792857142857) [operations. Batched writes in Firebase are](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=11&mode=live&start=73.009) [a way to group a large number of write](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=11&mode=live&start=75.36975000000004) [operations across multiple documents](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=11&mode=live&start=77.7775714285714)[stored in Firestore. This is typically](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=11&mode=live&start=79.3955) [used when you don't need to perform any](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=11&mode=live&start=81.51587499999998) [reads between your writes. You only want](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=11&mode=live&start=83.77542857142855) [to perform updates or writes. Initialize a](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=11&mode=live&start=86.265125) [batch operation by calling db.batch, and](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=11&mode=live&start=88.98733333333334) [next you set up those series of operations](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=11&mode=live&start=91.52300000000001) [that you want to perform. Let's get a](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=11&mode=live&start=94.76628571428571)[reference to the first document, that is](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=11&mode=live&start=96.72428571428571) [for the restaurant, rest\_03, this is](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=11&mode=live&start=98.427) [something that we want to create. Call the](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=11&mode=live&start=100.57100000000001) [batch.set function on this document in](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=11&mode=live&start=103.73866666666666) [order to create a new restaurant within](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=11&mode=live&start=106.11085714285716) [our restaurants collection. And here are](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=11&mode=live&start=109.06219999999999) [the fields and the corresponding values](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=11&mode=live&start=111.29042857142859) [for this restaurant. Let's use this batch](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=11&mode=live&start=112.95500000000001) [operation to create another restaurant,](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=11&mode=live&start=115.17328571428571) [rest\_04. Call the batch.set function and](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=11&mode=live&start=118.06500000000001) [specify all of the field values for this](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=11&mode=live&start=121.09283333333335)[restaurant as well. Batch operations can](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=11&mode=live&start=123.95024999999997) [be executed in one go on Firestore by](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=11&mode=live&start=126.039) [calling batch.commit, and once the batch](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=11&mode=live&start=128.92842857142858) [has been committed, we'll print out the](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=11&mode=live&start=131.1911428571429) [message, Documents added to screen. Invoke](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=11&mode=live&start=134.08499999999995) [this batchedWrite function. Save this](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=11&mode=live&start=137.2615) [file, switch over to your terminal window,](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=11&mode=live&start=139.95257142857142)[and execute batched\_ops.js. Documents have](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=11&mode=live&start=142.47519999999997) [been added, and we can confirm this by](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=11&mode=live&start=144.91685714285717) [heading over to our Firebase web console.](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=11&mode=live&start=147.0742857142857) [Here are the details for the restaurants](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=11&mode=live&start=150.244) [that we just added, rest\_03 and rest\_04.](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=11&mode=live&start=151.374) [Let's go back to our batched\_ops.js file](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=11&mode=live&start=156.392) [and perform some more batch updates. We'll](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=11&mode=live&start=158.99) [define a new function called](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=11&mode=live&start=161.42033333333333) [batchedUpdates, which will update multiple](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=11&mode=live&start=163.262) [documents stored in Firestore. Initialize](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=11&mode=live&start=166.491) [a batch by calling db.batch, we've seen](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=11&mode=live&start=168.86033333333333) [this before, and get a reference to the](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=11&mode=live&start=171.48524999999998) [rest\_02 document. We want to specifically](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=11&mode=live&start=174.81) [update the bestSellers field for this](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=11&mode=live&start=177.52966666666669)[document to specify that Birria and Pozole](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=11&mode=live&start=179.5516666666667) [are best sellers at this restaurant.](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=11&mode=live&start=182.61733333333328) [BatchedUpdates can be used to update](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=11&mode=live&start=185.284) [documents across collections. Let's get a](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=11&mode=live&start=186.704) [reference to the users collection,](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=11&mode=live&start=189.61728571428569) [specifically the document that we created](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=11&mode=live&start=191.1628) [for Alan Matthews. The ID that I've](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=11&mode=live&start=194.55159999999998) [specified here is the unique ID associated](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=11&mode=live&start=197.48349999999996) [with the Alan Matthews document. I'm now](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=11&mode=live&start=199.91949999999997) [going to use the batch.delete function in](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=11&mode=live&start=202.94899999999998) [order to delete this particular user from](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=11&mode=live&start=205.0737142857143) [the users collection. Observe that our](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=11&mode=live&start=207.75079999999997) [batch operation operates on both the](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=11&mode=live&start=210.67) [restaurants collection, as well as the](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=11&mode=live&start=213.02340000000004) [users collections. Call batch.commit to](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=11&mode=live&start=215.52766666666673) [commit this operation. Invoke this](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=11&mode=live&start=217.92200000000003) [function. Now let's head over to the](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=11&mode=live&start=219.93728571428574) [terminal window and execute this js file.](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=11&mode=live&start=222.10600000000002) [The updates seem to have been performed](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=11&mode=live&start=224.794) [successfully, and we can confirm this](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=11&mode=live&start=226.226) [using the web console. You can see that](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=11&mode=live&start=227.94457142857135) [the users collection has just one document](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=11&mode=live&start=231.00149999999996)[within it. The document for Alan Matthews](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=11&mode=live&start=233.4294) [has been deleted, and the restaurant](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=11&mode=live&start=235.44271428571435) [uniquely identified by rest\_02 has an updated list of bestSellers.](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=11&mode=live&start=238.14819999999997)

[Simple Queries Using the Where Clause](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=12&mode=live)

[In this demo, we'll see some examples of](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=12&mode=live&start=0.75) [running queries on Firestore. We'll work](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=12&mode=live&start=3.387) [with some simple queries and some compound](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=12&mode=live&start=5.582857142857143) [queries. We'll write all of our query](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=12&mode=live&start=7.921333333333334) [operations in a new file called](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=12&mode=live&start=10.419285714285714) [firestore\_queries.js. Open this up using](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=12&mode=live&start=13.044666666666664) [the nano editor. Set up the usual commands](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=12&mode=live&start=14.797857142857143) [to include and initialize the Firebase](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=12&mode=live&start=17.161125) [SDK. These are all commands you've seen](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=12&mode=live&start=19.855500000000003) [before, and make sure you initialize](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=12&mode=live&start=21.816285714285723) [Firestore and get a reference to it in the](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=12&mode=live&start=24.34714285714285)[db variable. Get a reference to the](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=12&mode=live&start=27.660111111111114) [restaurants collection in the colRef](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=12&mode=live&start=29.11383333333334) [variable. We are now going to run a query](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=12&mode=live&start=31.523200000000003) [to get all Italian restaurants. Remember](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=12&mode=live&start=33.326199999999986) [that Cloud Firestore automatically indexes](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=12&mode=live&start=36.8328) [all fields within your documents, all](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=12&mode=live&start=39.989999999999995) [single fields, so you can simply run a](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=12&mode=live&start=42.168) [where clause for category equal to](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=12&mode=live&start=44.312) [Italian, and this will retrieve all](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=12&mode=live&start=46.76771428571429) [Italian restaurants. Invoking the get](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=12&mode=live&start=49.45914285714287) [function on this query with retrieve all](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=12&mode=live&start=51.27714285714285) [the Italian restaurants present in your](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=12&mode=live&start=53.93350000000001) [database. You can then iterate over the](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=12&mode=live&start=56.00025000000001) [document set that is returned here using a](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=12&mode=live&start=57.62885714285714) [forEach statement. Within this forEach, we](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=12&mode=live&start=61.30377777777777)[simply print out the name of the Italian](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=12&mode=live&start=63.51057142857144) [restaurant. Invoke the](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=12&mode=live&start=66.53399999999996) [getItalianRestaurants function, and we'll](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=12&mode=live&start=68.384) [execute this js file using our terminal](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=12&mode=live&start=70.50175)[window, and you can see that Long Island](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=12&mode=live&start=72.8002857142857) [and Fire in the Hole are two Italian](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=12&mode=live&start=74.87844444444444) [restaurants. You can confirm this using](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=12&mode=live&start=78.076) [the Firestore console. Here is Long](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=12&mode=live&start=80.77174999999998) [Island, it's an Italian restaurant,](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=12&mode=live&start=82.53757142857144) [rest\_02, and rest\_04 is Fire in the Hole,](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=12&mode=live&start=83.9854) [also an Italian restaurant. Let's go back](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=12&mode=live&start=87.746) [to our terminal window and write some more](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=12&mode=live&start=89.88712500000001) [code in our firestore\_queries.js file.](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=12&mode=live&start=92.0015) [This time you want to retrieve all popular](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=12&mode=live&start=94.625) [restaurants with a certain rating. Invoke](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=12&mode=live&start=96.74683333333333) [the where clause on the collection](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=12&mode=live&start=99.18857142857142) [reference that we have to the restaurants](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=12&mode=live&start=101.394) [collection, and specify that numRatings](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=12&mode=live&start=103.294) [should be greater than 10. You should have](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=12&mode=live&start=105.114) [at least 10 ratings for a particular](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=12&mode=live&start=107.31233333333333) [restaurant for it to be considered](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=12&mode=live&start=108.65533333333335) [popular. The indexes that have been set up](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=12&mode=live&start=110.21016666666667) [by Firestore automatically support range](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=12&mode=live&start=113.62899999999999) [queries on single fields by default. This](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=12&mode=live&start=115.874) [query will retrieve all of the documents](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=12&mode=live&start=119.41257142857141) [which correspond to restaurants that are](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=12&mode=live&start=122.77699999999999) [popular, with a large number of ratings,](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=12&mode=live&start=124.65157142857143) [and we'll simply print out the name of the](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=12&mode=live&start=126.10000000000001) [restaurant to screen. Invoke the function](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=12&mode=live&start=129.1195) [getPopularRestaurants, save this file, and](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=12&mode=live&start=131.95375) [execute this on your terminal window, and](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=12&mode=live&start=133.56200000000004) [you can see that Fire in the Hole and Long](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=12&mode=live&start=135.31957142857144) [Island both have greater than 10 ratings.](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=12&mode=live&start=138.36566666666673) [These are popular restaurants. Let's write](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=12&mode=live&start=140.773) [some more queries in our](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=12&mode=live&start=143.23328571428573) [Firestore\_queries.js file. This time we](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=12&mode=live&start=144.489) [define a function to query the bestsellers](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=12&mode=live&start=147.68262499999997) [within a particular restaurant. We want to](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=12&mode=live&start=150.22400000000002) [retrieve all of the restaurants within our](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=12&mode=live&start=153.279125) [Firestore database which contains](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=12&mode=live&start=155.74339999999998) [Margherita Pizza amongst its bestsellers.](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=12&mode=live&start=158.04516666666666) [So the where clause says, bestSellers,](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=12&mode=live&start=161.211) [array-contains, Margherita Pizza. Remember](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=12&mode=live&start=164.363) [that the indexes that Firestore sets up by](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=12&mode=live&start=167.00966666666667) [default also support the array-contains](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=12&mode=live&start=170.16257142857143) [operation. Once we have all restaurants](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=12&mode=live&start=172.5935) [that sell good Margherita pizza, we can](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=12&mode=live&start=175.08928571428567) [simply print out the entire document to](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=12&mode=live&start=177.52100000000002) [screen. Invoke the queryBestSellers](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=12&mode=live&start=180.76000000000002) [function, switch over to your terminal](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=12&mode=live&start=183.2845) [window, and execute this node code. And](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=12&mode=live&start=184.96183333333332) [you can see that we have exactly one](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=12&mode=live&start=187.6076666666667) [restaurant, your Fire in the Hole, where](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=12&mode=live&start=189.637) [Margherita pizza is listed amongst the bestsellers.](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=12&mode=live&start=191.93283333333335)

[Compound Queries](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=13&mode=live)

[Let's write a few compound queries in our](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=13&mode=live&start=0) [firestore\_queries.js file. Comment out all](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=13&mode=live&start=3.15) [previous function invocations, and let's](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=13&mode=live&start=6.5082) [write a new function in order to retrieve](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=13&mode=live&start=8.28657142857143) [filtered results from Firestore. Firestore](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=13&mode=live&start=11.548000000000002) [supports very rich ordering and filtering,](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=13&mode=live&start=13.849833333333333) [and we'll see a glimpse of that just here.](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=13&mode=live&start=15.815375) [Using a collection reference to our](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=13&mode=live&start=17.94514285714286) [restaurants collection, we'll run a query](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=13&mode=live&start=20.055500000000002) [to retrieve all restaurants where the](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=13&mode=live&start=22.413142857142855) [state is Texas and the category is](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=13&mode=live&start=24.634) [Burgers. The default indexes that](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=13&mode=live&start=28.294124999999994) [Firestore creates supports two equality](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=13&mode=live&start=30.356999999999992) [clauses on different fields. There is](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=13&mode=live&start=32.65185714285714) [nothing special that you need to configure](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=13&mode=live&start=35.11) [in order to enable this. Let's run this](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=13&mode=live&start=36.796166666666664) [query, retrieve the document set, and](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=13&mode=live&start=40.00485714285715) [print all of the results to screen. Invoke](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=13&mode=live&start=42.260888888888886) [the function getFilteredResults, execute](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=13&mode=live&start=45.4375) [this code after saving the file, and you](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=13&mode=live&start=47.680142857142854) [can see that there's exactly one](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=13&mode=live&start=49.64425) [restaurant in the Burgers category in the](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=13&mode=live&start=50.836) [state of Texas, well, at least in our](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=13&mode=live&start=53.414) [database, not in real life. Let's go back](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=13&mode=live&start=56.461) [to editing firestore\_queries.js, and this](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=13&mode=live&start=59.0844) [time we'll run a query to limit the number](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=13&mode=live&start=62.03188888888889) [of results written. GetLimitedResults is](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=13&mode=live&start=64.46679999999999) [the name of the function. We want to](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=13&mode=live&start=66.19457142857144) [retrieve all restaurants where the average](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=13&mode=live&start=68.90942857142858) [rating is greater than equal to 1, but we](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=13&mode=live&start=70.658) [want to limit our results to just two](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=13&mode=live&start=73.15910000000001) [restaurants, the first two that are](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=13&mode=live&start=75.29157142857143) [returned by this query. This, once again,](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=13&mode=live&start=77.599) [is an operation that is supported by the](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=13&mode=live&start=79.62587499999998) [default indexes on Firestore. Iterate](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=13&mode=live&start=82.00457142857144) [through the documents returned in the](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=13&mode=live&start=84.0025) [result and print them out to screen.](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=13&mode=live&start=86.07187499999999) [Invoke the getLimitedResults function,](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=13&mode=live&start=88.29) [execute this code using the terminal](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=13&mode=live&start=90.768) [window, and you can see that exactly two](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=13&mode=live&start=93.33) [results are returned, one for the](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=13&mode=live&start=95.254)[restaurant Prime Place, and another for](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=13&mode=live&start=98.042) [Long Island. Firestore also allows you to](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=13&mode=live&start=101.24779999999998) [use orderBy clauses on your queries. Let's](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=13&mode=live&start=104.14050000000002) [write a function to get ordered results](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=13&mode=live&start=106.89642857142857) [from our database. We'll run a query to](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=13&mode=live&start=108.76325) [retrieve all of the restaurants available](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=13&mode=live&start=111.424) [in our database in the descending order of](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=13&mode=live&start=113.39899999999999) [the name field. OrderBy clauses on single](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=13&mode=live&start=116.9512857142857) [fields are supported by default. Once we](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=13&mode=live&start=120.379) [retrieve all of the restaurants in the](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=13&mode=live&start=123.15825) [descending order of name, print them out](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=13&mode=live&start=125.2406) [to screen. Invoke the getOrderedResults](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=13&mode=live&start=127.954) [function, and let's execute](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=13&mode=live&start=130.61375) [Firestore\_queries on the command line, and](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=13&mode=live&start=132.16850000000002) [you can see that all four restaurants](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=13&mode=live&start=133.872) [stored in our database are returned in the](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=13&mode=live&start=135.72816666666668) [descending order of name. Prime Place is the first, Fire Drive Thru is at the end.](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=13&mode=live&start=138.58014285714287)

[Composite Indexes](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=14&mode=live)

[So far we've seen examples of simple and](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=14&mode=live&start=0.75) [compound queries that are supported by the](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=14&mode=live&start=2.57) [single field indexes that are set up by](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=14&mode=live&start=5.037) [default on Firestore. Let's now see how we](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=14&mode=live&start=7.556) [can configure composite indexes for more](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=14&mode=live&start=10.527857142857139) [advanced queries. We'll continue editing](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=14&mode=live&start=13.151) [our firestore\_queries.js file here. At the](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=14&mode=live&start=15.019749999999998)[very bottom, we'll add a new function](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=14&mode=live&start=18.79275) [called filterByAddress. In this query,](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=14&mode=live&start=20.718) [we'll apply a filtering operation that's](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=14&mode=live&start=23.324571428571424) [based on two separate fields within a](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=14&mode=live&start=25.523666666666667) [document, the Address.state field and the](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=14&mode=live&start=27.775499999999997) [Address.country field. Now, Firestore does](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=14&mode=live&start=30.391200000000005) [not support query filters on two different](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=14&mode=live&start=32.613) [fields, at least not by default. Notice](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=14&mode=live&start=35.9116) [that we have a range query on](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=14&mode=live&start=38.37525) [Address.state greater than equal to CA,](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=14&mode=live&start=40.365) [and we have an equality filter on](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=14&mode=live&start=43.387)[Address.country. Address is a nested](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=14&mode=live&start=45.343) [field, as we've seen before, and this is](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=14&mode=live&start=48.598) [how we access the individual fields within](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=14&mode=live&start=50.412) [the nested field. So we have a range query](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=14&mode=live&start=52.737) [and an equality query, both of which](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=14&mode=live&start=55.488) [operate on different fields. We'll call](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=14&mode=live&start=57.914) [queryRef.get to retrieve all of the](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=14&mode=live&start=60.89600000000001) [documents that satisfy this query clause,](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=14&mode=live&start=63.18885714285714) [and print out the document data to screen.](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=14&mode=live&start=64.94888888888889) [Invoke the filterByAddress function,](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=14&mode=live&start=67.972) [comment out all other function](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=14&mode=live&start=70.124) [invocations, and let's execute this on our](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=14&mode=live&start=71.95733333333337) [command line. And you can see that this](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=14&mode=live&start=74.28974999999998) [results in an error. If you observe the](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=14&mode=live&start=76.56019999999998) [error closely, you'll find that Firestore](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=14&mode=live&start=78.86233333333331) [gives you some useful information. It](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=14&mode=live&start=80.48871428571428) [tells you that this query requires an](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=14&mode=live&start=82.134) [index that you can create using this link](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=14&mode=live&start=84.22000000000001) [here. Copy over this link that you see on](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=14&mode=live&start=87.05600000000001) [screen, and paste it into the browser](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=14&mode=live&start=89.37533333333336) [window where you're logged into Firebase.](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=14&mode=live&start=91.99500000000003) [This brings up a window, giving you the](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=14&mode=live&start=93.977) [option to create a composite index that](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=14&mode=live&start=95.895) [will support this query. And you can see,](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=14&mode=live&start=98.089) [very helpfully, Firestore has specified](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=14&mode=live&start=100.518) [exactly the kind of index that you need to](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=14&mode=live&start=102.04057142857141)[create. You need to index the](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=14&mode=live&start=104.8951666666667) [Address.country and Address.state fields](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=14&mode=live&start=107.04933333333331) [in ascending order. Click on the Create](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=14&mode=live&start=109.001) [index button in order to set this](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=14&mode=live&start=111.66700000000003)[composite index up. This index will take a](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=14&mode=live&start=113.80000000000001) [minute or so to build. Wait patiently](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=14&mode=live&start=116.18800000000003) [until the index is enabled. You can now](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=14&mode=live&start=118.41928571428572) [switch back to your terminal window and](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=14&mode=live&start=121.20237500000002) [execute firestore\_queries once again, and](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=14&mode=live&start=123.15950000000001) [you'll find that this time your query runs](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=14&mode=live&start=125.33200000000001) [through just fine, thanks to the composite](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=14&mode=live&start=128.2075) [index that we had set up in Firestore. As](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=14&mode=live&start=130.643) [we've seen and discussed before, Firestore](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=14&mode=live&start=134.0685) [offers very high performance and low](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=14&mode=live&start=136.29933333333332) [latency reads, however, this is made](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=14&mode=live&start=138.99185714285716) [possible because there are constraints on](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=14&mode=live&start=140.797) [the kind of queries that Firestore](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=14&mode=live&start=143.513375) [supports. Here are some examples of](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=14&mode=live&start=145.55562499999996) [queries that Firestore does not support,](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=14&mode=live&start=147.31814285714287) [even with composite indexes. If you have](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=14&mode=live&start=149.72) [queries which have range filters on](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=14&mode=live&start=152.01228571428572) [different fields, such as age greater than](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=14&mode=live&start=153.51971428571431) [25 and score less than equal to 40,](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=14&mode=live&start=155.67499999999998) [Firestore does not support this. Or if you](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=14&mode=live&start=158.26800000000003) [have a single query which accesses](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=14&mode=live&start=161.27087500000002) [multiple collections or subcollections,](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=14&mode=live&start=163.038) [that is also not supported. Logical OR](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=14&mode=live&start=165.18883333333332) [queries do not work in Firestore, or](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=14&mode=live&start=168.28985714285713) [queries which have a not equal to clause.](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=14&mode=live&start=170.7553333333333) [In each of these cases, you'll have to](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=14&mode=live&start=174.523)[find a way to structure your query a](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=14&mode=live&start=175.85811111111101) [little differently so that it can run on](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=14&mode=live&start=178.46275000000006) [Firestore. Let's go back to editing our](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=14&mode=live&start=181.3275) [firestore\_queries.js file, and this time](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=14&mode=live&start=183.314) [we'll take a look at a query which will](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=14&mode=live&start=185.967) [not work even with composite indexes. In](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=14&mode=live&start=187.816) [this query, we'll try retrieving documents](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=14&mode=live&start=191.09666666666666) [from our Firestore database. We'll apply](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=14&mode=live&start=192.8632) [two range queries on different fields. We](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=14&mode=live&start=195.44366666666667) [have a range query on the avgRating field,](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=14&mode=live&start=197.62085714285715) [as well as the price field. For the](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=14&mode=live&start=199.90550000000005)[documents that we'll retrieve, we'll](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=14&mode=live&start=202.42728571428574) [simply print them out to the console.log.](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=14&mode=live&start=204.1627142857143) [Invoke this function by calling](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=14&mode=live&start=206.596) [filterbyPriceRating, save this file, and](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=14&mode=live&start=209.32999999999998)[let's execute this on our command line,](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=14&mode=live&start=211.4285) [and you'll find that this is an error.](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=14&mode=live&start=213.432375) [Observe that the error does not offer you](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=14&mode=live&start=216.062) [a link to set up a composite index. This](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=14&mode=live&start=218.65399999999997) [is an example of a query that Firestore](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=14&mode=live&start=221.174875) [does not support even with composite indexes.](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=14&mode=live&start=223.32333333333332)

[Realtime Updates with Document Snapshots](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=15&mode=live)

[In this demo, we'll see how we can use](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=15&mode=live&start=0.75) [snapshots to get real-time updates from](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=15&mode=live&start=2.615) [Firestore. We'll also see how we can use](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=15&mode=live&start=4.912) [transactions to read and write data](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=15&mode=live&start=7.312) [atomically. We'll write our real-time](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=15&mode=live&start=9.96742857142857) [update queries in the snapshots.js file.](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=15&mode=live&start=11.915333333333333) [Let's set up and initialize the Firebase](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=15&mode=live&start=15.196) [SDK as we've done before, and get a](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=15&mode=live&start=17.215) [reference to the restaurants collection.](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=15&mode=live&start=19.517) [Let's first see an example of a get query,](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=15&mode=live&start=21.718) [which simply retrieves documents, but does](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=15&mode=live&start=24.090999999999998) [not listen for real-time updates. We'll](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=15&mode=live&start=26.61557142857143) [write this in the getAllRestaurants](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=15&mode=live&start=28.966142857142856) [function. We'll use the collection](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=15&mode=live&start=31.211857142857138) [reference, call the get function on it,](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=15&mode=live&start=33.03219999999999) [and get the current snapshot of all](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=15&mode=live&start=35.05699999999999) [documents in our Firestore database. If](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=15&mode=live&start=37.39457142857143) [the get request is successful, we'll print](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=15&mode=live&start=39.867000000000004) [out all of these documents to the console.](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=15&mode=live&start=42.52385714285715) [In the case of error, we'll print out the](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=15&mode=live&start=44.582) [error. Let's invoke the getAllRestaurants](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=15&mode=live&start=46.7087) [function, and then switch over to the](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=15&mode=live&start=49.76) [command line after saving this file and](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=15&mode=live&start=52.456) [execute the snapshots.js file. And you can](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=15&mode=live&start=54.199799999999996) [see that all of the restaurants currently](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=15&mode=live&start=57.34000000000001) [in our Firestore database is printed to](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=15&mode=live&start=59.1095) [screen. The get function makes a one-time](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=15&mode=live&start=62.318333333333335) [request to get all documents in our](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=15&mode=live&start=65.17828571428572) [collection. It's not a listener for](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=15&mode=live&start=67.39457142857141) [real-time updates. Let's switch back to](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=15&mode=live&start=69.89371428571427)[editing our snapshots.js file, and see how](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=15&mode=live&start=72.034) [we can hook up a listener to real-time](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=15&mode=live&start=74.08214285714287) [updates. of our data. This will write in](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=15&mode=live&start=77.25642857142859) [the function getCurrentData. In this](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=15&mode=live&start=79.21087499999997) [particular example, we'll listen for](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=15&mode=live&start=81.9055) [updates on the specific document](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=15&mode=live&start=83.79585714285713) [identified by the unique ID, rest\_01.](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=15&mode=live&start=85.98285714285714) [We'll listen for real-time changes to this](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=15&mode=live&start=90.386) [document using the onSnapshot method. This](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=15&mode=live&start=92.82116666666667) [gives us a reference to this document. The](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=15&mode=live&start=96.33449999999999) [first time you call the onSnapshot method,](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=15&mode=live&start=98.52842857142858) [that is the initial call, this will create](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=15&mode=live&start=100.58483333333334) [a document snapshot immediately with the](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=15&mode=live&start=103.11050000000002) [current contents of this document, and our](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=15&mode=live&start=105.20999999999998) [callback will be invoked. The onSnapshot](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=15&mode=live&start=108.4035) [function will constantly be waiting for](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=15&mode=live&start=111.2672) [updates on this document, and this](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=15&mode=live&start=113.61628571428572) [callback will be called each time this](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=15&mode=live&start=115.49950000000001) [document is updated. Let's see how this](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=15&mode=live&start=117.827) [works by invoking the getCurrentData](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=15&mode=live&start=120.41149999999998) [function, save this file, switch over to](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=15&mode=live&start=122.0882) [the terminal window, and run node](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=15&mode=live&start=124.94749999999999) [snapshots.js. You can see that the](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=15&mode=live&start=128.02249999999998) [callback is invoked immediately with the](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=15&mode=live&start=130.09587499999995) [current contents of this file. You can](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=15&mode=live&start=131.8305) [also see that this application is waiting](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=15&mode=live&start=133.85649999999995) [for updates. we'll now switch over to our](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=15&mode=live&start=136.56759999999997) [Firestore console and update the ratings](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=15&mode=live&start=139.52628571428573) [of this rest\_01 document. We'll change the](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=15&mode=live&start=141.84228571428574) [ratings to 11, click update, and when you](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=15&mode=live&start=144.58400000000003) [go back to the terminal window you'll find](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=15&mode=live&start=147.64600000000004) [that the callback has been invoked again.](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=15&mode=live&start=149.99324999999993) [The latest updates that were made to this](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=15&mode=live&start=152.948) [document in Firestore are now reflected](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=15&mode=live&start=155.458) [within our application. Let's try this](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=15&mode=live&start=158.455) [once again. You can see that the price](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=15&mode=live&start=160.73319999999998) [field has a value of 2. Switch over to the](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=15&mode=live&start=162.71000000000004) [Firestore web console, and let's change](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=15&mode=live&start=165.49662500000008) [this to be 3. Click on Update. The price](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=15&mode=live&start=167.5146666666667) [rating is now 3, and if you go back to](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=15&mode=live&start=170.35387499999996) [your terminal window you'll find that this](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=15&mode=live&start=172.66133333333326) [real-time update is now reflected within your web app.](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=15&mode=live&start=174.9483333333333)

[Realtime Updates Using Collection Snapshots](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=16&mode=live)

[In the previous clip, we saw an example of](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=16&mode=live&start=0.75) [how we could listen to real-time updates](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=16&mode=live&start=2.551) [on a single document. In this example,](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=16&mode=live&start=4.608) [we'll continue working with the](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=16&mode=live&start=7.1674999999999995) [snapshots.js file, and we'll see how we](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=16&mode=live&start=8.944999999999999) [can listen to changes across entire](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=16&mode=live&start=11.38525) [collections. In order to set up change](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=16&mode=live&start=13.501) [listeners on the collection as a whole, we](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=16&mode=live&start=16.001) [can simply call the onSnapshot method on](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=16&mode=live&start=18.47257142857143) [the collection reference. This will give](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=16&mode=live&start=21.890749999999997) [us a collection snapshot, which we can](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=16&mode=live&start=24.386428571428567) [then use to listen for document changes](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=16&mode=live&start=25.992750000000004) [using the docChanges method. This allows](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=16&mode=live&start=28.552) [us to iterate over every change within a](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=16&mode=live&start=31.719714285714286) [collection, and for each change we can](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=16&mode=live&start=34.347) [check to see what kind of change was made](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=16&mode=live&start=36.526666666666664) [to this documents collection. If the](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=16&mode=live&start=39.101285714285716) [change.type was added, we'll simply print](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=16&mode=live&start=41.2142) [to screen a new restaurant was added. The](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=16&mode=live&start=43.326285714285724) [change type was modified, which means a](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=16&mode=live&start=45.9684) [restaurant was updated. We'll print that](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=16&mode=live&start=48.36850000000001) [out to screen. If the change type was](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=16&mode=live&start=50.055) [removed, it means a restaurant was deleted](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=16&mode=live&start=51.92777777777778) [from our collection. Let's now test this](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=16&mode=live&start=54.2445) [out and see how this works. Invoke the](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=16&mode=live&start=56.855399999999996) [setChangeListener command, save this file](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=16&mode=live&start=59.6345) [and run snapshots.js. The onSnapshot](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=16&mode=live&start=62.2625) [function we know will first give us a](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=16&mode=live&start=64.64200000000001) [current snapshot of our collection. Here](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=16&mode=live&start=67.448) [are the restaurants within our collection.](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=16&mode=live&start=69.84328571428571) [We have the Prime Place restaurant with 11](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=16&mode=live&start=72.005) [ratings, we have the Long Island](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=16&mode=live&start=74.65428571428572) [restaurant with an average rating of 3.35,](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=16&mode=live&start=77.182) [and two other restaurants, Fire Drive Thru](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=16&mode=live&start=80.307) [and Fire in the Hole. Let's assume that](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=16&mode=live&start=82.264) [your restaurant rating app has updated the](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=16&mode=live&start=85.52999999999999) [average rating for Prime Place. It's now](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=16&mode=live&start=88.19757142857144) [3.5, not 3.35. And once you make this](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=16&mode=live&start=91.26985714285713) [change, you can go back to your terminal](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=16&mode=live&start=94.28116666666668) [window and you'll find that this change is](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=16&mode=live&start=96.24175000000005)[now reflected within our web app. This was](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=16&mode=live&start=98.65487500000003) [a change that modified a document within](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=16&mode=live&start=101.29775000000001) [our collection. We'll now switch back to](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=16&mode=live&start=103.57433333333334) [our Firestore console and add a new](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=16&mode=live&start=106.1947142857143) [document, a new restaurant to our](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=16&mode=live&start=108.49666666666667) [collection. Rest\_00 is the document ID,](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=16&mode=live&start=110.47050000000003) [and the name is just some dummy\_text. The](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=16&mode=live&start=112.58655555555558)[addition of this document is a change to](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=16&mode=live&start=116.1615) [our restaurants collection, and this is](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=16&mode=live&start=118.36314285714286) [reflected in our web app as well. You can](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=16&mode=live&start=120.17) [see that a new restaurant with the name](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=16&mode=live&start=122.03866666666667) [dummy\_text has been added. We have](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=16&mode=live&start=123.892) [changeListeners to track each of these](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=16&mode=live&start=126.155) [real-time changes. We can try this once](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=16&mode=live&start=128.42849999999999) [again. Let's add a field to our rest\_00](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=16&mode=live&start=130.3873333333333) [document. This is a dummy field with a](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=16&mode=live&start=132.85475000000008) [dummy value. This will also be reflected](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=16&mode=live&start=135.46455555555553) [as a change to our real-time listener. You](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=16&mode=live&start=137.42399999999998) [can see that our restaurant has been](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=16&mode=live&start=139.92037499999998) [modified. And the newly updated data is](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=16&mode=live&start=141.666) [available within our app. One last](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=16&mode=live&start=144.736) [operation that we need to test, and that](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=16&mode=live&start=146.98000000000002) [is deleting a document. Click on the](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=16&mode=live&start=149.44966666666664) [three-dot menu to the top right, and let's](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=16&mode=live&start=151.67775) [get rid of the rest\_00 document. Once you](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=16&mode=live&start=154.10999999999996) [hit delete here, you'll find that this is also reflected in our web application.](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=16&mode=live&start=157.10075)

[Transactions](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=17&mode=live)

[Cloud Firestore also supports atomic](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=17&mode=live&start=0.75) [updates using transactions. Let's continue](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=17&mode=live&start=3.24) [editing our snapshots.js file, and see how](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=17&mode=live&start=5.844200000000001) [we can set up a transaction using node.](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=17&mode=live&start=8.03411111111111) [I'll define a new function here called](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=17&mode=live&start=10.998) [updatePriceTransaction. I get a reference](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=17&mode=live&start=13.116) [to the rest\_02 document and store it in](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=17&mode=live&start=17.022) [the docRef variable. You can create a new](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=17&mode=live&start=20.010000000000005) [transaction on any collection by calling](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=17&mode=live&start=22.627750000000002) [the db.runTransaction method. Within this](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=17&mode=live&start=25.792999999999996) [transaction represented by t, we want to](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=17&mode=live&start=28.84033333333333) [operate on the document which refers to](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=17&mode=live&start=31.49575) [the rest\_02 restaurant. Within this](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=17&mode=live&start=34.385400000000004) [transaction, we'll perform a read then a](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=17&mode=live&start=37.04633333333334) [write operation. We'll read the current](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=17&mode=live&start=39.633399999999995) [price associated with this restaurant and](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=17&mode=live&start=41.70300000000001) [increment it by 1. We then write this](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=17&mode=live&start=43.894) [updated value back to the document](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=17&mode=live&start=46.7885) [reference by calling t.update. If the](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=17&mode=live&start=49.176) [transaction runs through successfully,](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=17&mode=live&start=51.971599999999995) [we'll print out Transaction success,](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=17&mode=live&start=53.5208) [otherwise, we'll print out Transaction](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=17&mode=live&start=55.4632) [failure. Go ahead, call the](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=17&mode=live&start=57.563) [updatePriceTransaction function that we](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=17&mode=live&start=60.646) [just wrote. Go ahead, save this file, and](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=17&mode=live&start=62.0698) [let's execute this using the command line.](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=17&mode=live&start=64.23375) [And you can see here that the transaction](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=17&mode=live&start=66.479) [was a success, and the change is reflected](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=17&mode=live&start=68.219) [within the rest\_02 document. The value](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=17&mode=live&start=70.935)[associated with the price field was](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=17&mode=live&start=74.739) [originally 3. It has been incremented by](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=17&mode=live&start=76.4065) [1, it's now 4. And with this demo, we come](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=17&mode=live&start=79.12533333333333) [to the very end of this introductory](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=17&mode=live&start=81.96999999999997) [module on Cloud Firestore. We saw how](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=17&mode=live&start=83.94357142857145) [Firestore is a scalable NoSQL service,](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=17&mode=live&start=86.69449999999999) [which is a part of the Firebase mobile and](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=17&mode=live&start=88.94037499999999) [web development platform. Firestore on the](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=17&mode=live&start=92.2676) [GCP has been optimized to store document](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=17&mode=live&start=94.88375) [data, where the fields within a document](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=17&mode=live&start=97.274) [can be arbitrary. Different documents](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=17&mode=live&start=100.35749999999999) [within the same collection can have](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=17&mode=live&start=102.4134) [different fields. Firestore allows client](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=17&mode=live&start=105.0246) [applications, whether they're mobile or](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=17&mode=live&start=107.67825) [web applications, to receive real-time](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=17&mode=live&start=109.32133333333331) [updates when the underlying data changes.](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=17&mode=live&start=111.16949999999999) [Firestore is a highly performant database.](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=17&mode=live&start=114.578) [Every field within every document in the](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=17&mode=live&start=117.602) [collection is automatically indexed, which](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=17&mode=live&start=119.695) [means the performance of reads scales](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=17&mode=live&start=122.05833333333334) [independent of the size of data that is](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=17&mode=live&start=124.38850000000001) [stored in Firestore. Firestore has a very](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=17&mode=live&start=126.854) [distinctive and unusual data model in](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=17&mode=live&start=129.85533333333333) [order to support this high performance.](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=17&mode=live&start=131.58614285714285) [There are also constraints on the queries](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=17&mode=live&start=133.531) [that you can run within Firestore.](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=17&mode=live&start=135.233) [Firestore data is stored in collections.](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=17&mode=live&start=137.526) [Documents make up collections. Documents](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=17&mode=live&start=140.368) [within them have fields or keys which are](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=17&mode=live&start=142.4892857142857) [associated with values. Documents can also](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=17&mode=live&start=145.4562) [hold subcollections of documents. In the](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=17&mode=live&start=147.89900000000003) [next module, we'll work with security](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=17&mode=live&start=150.77559999999997)[rules on your Firestore data. This will](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=17&mode=live&start=153.15599999999998) [allow you to specify very granular rules](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=17&mode=live&start=155.48285714285717) [for reading and writing data from your client applications.](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=26ecd7a2-8ddd-4f08-85ed-057278abedf1&clip=17&mode=live&start=158.16600000000005)

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Now, if you're a client of the](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=0&mode=live&start=5.995428571428571) [server library for Cloud Firestore where](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=0&mode=live&start=8.5015) [you write to Cloud Firestore directly, not](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=0&mode=live&start=10.976857142857144) [from a client application, you'll use IAM,](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=0&mode=live&start=13.196857142857143) [or Identity and Access Management for](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=0&mode=live&start=16.595) [role-based Access Control to Firestore](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=0&mode=live&start=18.917) [data. However, if you're accessing Cloud](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=0&mode=live&start=21.716999999999995) [Firestore from a mobile or a web client,](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=0&mode=live&start=23.664) [there are different mechanisms to ensure](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=0&mode=live&start=26.252) [granular secure access to your data. These](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=0&mode=live&start=28.836) [are security rules that we use to enforce](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=0&mode=live&start=31.974625) [access control, and these are the security](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=0&mode=live&start=34.87185714285714) [rules that we configure on the web](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=0&mode=live&start=37.111222222222224) [console. These rules are optimized for](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=0&mode=live&start=39.77277777777778) [client-side access because they allow very](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=0&mode=live&start=42.496333333333325) [granular specifications. You can have](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=0&mode=live&start=44.524166666666666)[individual rules set up for reads, writes,](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=0&mode=live&start=46.29360000000001) [list operations, create operations, and so](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=0&mode=live&start=49.561) [on. Once you configured and deployed the](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=0&mode=live&start=52.418714285714294) [security rules, the best way to test them](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=0&mode=live&start=54.787) [is to use the Firestore simulator. Once](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=0&mode=live&start=57.015) [you're satisfied with how the rules work](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=0&mode=live&start=60.98142857142857) [in simulation, you can go ahead and use this in your production deployment.](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=0&mode=live&start=62.61175)

[Securing Data in Firestore](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=1&mode=live)

[Before we move on to understanding how](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=1&mode=live&start=0.75) [security rules work, you should know that](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=1&mode=live&start=2.611) [there are two ways of securing data in](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=1&mode=live&start=4.952) [Firestore. For web and mobile](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=1&mode=live&start=8.12266666666667) [applications, you'll use Firebase](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=1&mode=live&start=9.795000000000003) [authentication to ensure that only](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=1&mode=live&start=11.562399999999998) [authenticated users have access to your](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=1&mode=live&start=13.8925) [data, and you'll configure security rules](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=1&mode=live&start=16.270142857142858) [for granular access control. Rather than a](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=1&mode=live&start=18.639999999999997) [mobile or a web application, if you're a](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=1&mode=live&start=21.518000000000004) [server client and you access Cloud](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=1&mode=live&start=23.732875) [Firestore directly, you'll use Identity](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=1&mode=live&start=25.819) [and Access Management and role-based](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=1&mode=live&start=28.445) [Access Control in order to secure data in](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=1&mode=live&start=30.30785714285714) [Firestore. The security rules that we'll](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=1&mode=live&start=33.666000000000004)[study in a lot of detail in this module,](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=1&mode=live&start=35.731571428571414) [do not work for server clients. Let's](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=1&mode=live&start=37.95380000000002) [briefly discuss securing data for server](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=1&mode=live&start=40.990833333333335) [clients before we move on to security](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=1&mode=live&start=43.13014285714286) [rules. Now Identity and Access Management](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=1&mode=live&start=45.06433333333333) [is a vast topic that merits its own course](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=1&mode=live&start=47.088499999999996) [on Pluralsight. IAM is not specific to](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=1&mode=live&start=50.503) [Cloud Firestore. This is the standard way](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=1&mode=live&start=53.315714285714286) [to manage access to all of GCP's](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=1&mode=live&start=55.32975000000001) [resources. IAM is what allows you to](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=1&mode=live&start=58.33160000000001) [control who has what permission for which](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=1&mode=live&start=61.13033333333335)[resource. So you configure users or](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=1&mode=live&start=64.70539999999998) [service accounts, that is for programmatic](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=1&mode=live&start=67.48271428571427) [access, and you assign specific roles to](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=1&mode=live&start=69.9498) [these accounts. Roles are associated with](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=1&mode=live&start=73.06725000000003) [permissions that allow you to specify very](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=1&mode=live&start=75.55433333333332) [granular access control on the server. For](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=1&mode=live&start=78.48214285714289) [example, if you want a server client to be](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=1&mode=live&start=81.5098888888889) [able to manage indexes on Firestore,](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=1&mode=live&start=83.72399999999999) [you'll assign the service account that](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=1&mode=live&start=86.166) [runs that server client, the role,](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=1&mode=live&start=88.43142857142857) [datastore.indexAdmin. This is the role](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=1&mode=live&start=90.641) [that allows full access to manage index](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=1&mode=live&start=93.68899999999998) [definitions for Firestore. Identity and](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=1&mode=live&start=96.26299999999998) [Access Management with GCP resources is](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=1&mode=live&start=98.71300000000001) [beyond the scope of this particular](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=1&mode=live&start=100.985) [course, which is focused on client](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=1&mode=live&start=102.96916666666667) [applications. For more information on](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=1&mode=live&start=104.6635) [securing access to your data using IAM,](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=1&mode=live&start=106.925) [this is a URL that you can visit. Now it's](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=1&mode=live&start=109.21499999999997) [very important that you understand that](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=1&mode=live&start=113.15328571428572) [these security rules that we are about to](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=1&mode=live&start=114.9905) [discuss apply only to client applications.](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=1&mode=live&start=117.69885714285714)[Server client libraries bypass all](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=1&mode=live&start=120.446) [security rules, and instead authenticate](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=1&mode=live&start=122.28849999999998) [through Google Application Default](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=1&mode=live&start=125.27940000000002) [Credentials, which uses service accounts](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=1&mode=live&start=128.1235) [configured with Identity and Access](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=1&mode=live&start=130.74033333333335) [Management permissions. That's not what](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=1&mode=live&start=133.5974) [we're about to discuss here. In this](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=1&mode=live&start=135.72725) [module, we'll focus on how we can secure](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=1&mode=live&start=137.67166666666668) [data for mobile and web clients. Now there](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=1&mode=live&start=139.88985714285715) [are two parts to securing data. There is](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=1&mode=live&start=143.12075) [Firebase authentication that allows users](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=1&mode=live&start=146.63)[to sign in to your web app as as an](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=1&mode=live&start=148.52319999999997) [authenticated user, either as a Google](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=1&mode=live&start=151.08142857142857) [user, an anonymous user, a Facebook user,](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=1&mode=live&start=153.0868) [and so on. And then there are granular](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=1&mode=live&start=155.9105) [security rules that you can use to secure](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=1&mode=live&start=158.74414285714286) [data without managing infrastructure or](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=1&mode=live&start=161.12449999999998) [writing server-side authentication and](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=1&mode=live&start=163.464) [authorization code. The rest of this](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=1&mode=live&start=165.979) [module, we'll see how security rules can](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=1&mode=live&start=168.152) [be configured, but you should have a big](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=1&mode=live&start=170.88812499999995) [picture understanding of the](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=1&mode=live&start=173.097)[authentication methods that Firebase](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=1&mode=live&start=174.9978) [provides. Before we get to security rules,](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=1&mode=live&start=177.31349999999998) [let's briefly discuss Firebase](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=1&mode=live&start=179.501) [authentication so that you can understand](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=1&mode=live&start=181.41) [what that's about. Now, there are several](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=1&mode=live&start=183.17) [ways to authenticate your user to](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=1&mode=live&start=185.95414285714287) [Firebase. You can use the Firebase UI,](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=1&mode=live&start=188.199) [which is a drop-in authentication solution](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=1&mode=live&start=190.2133333333333) [that handles the complete authentication](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=1&mode=live&start=192.5645) [flow for your mobile or web app. This is](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=1&mode=live&start=195.05260000000004) [the easiest way to integrate](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=1&mode=live&start=198.37885714285716)[authentication into your applications.](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=1&mode=live&start=200.036) [Another option is for you to use the](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=1&mode=live&start=202.132) [Firebase SDK. This is where you manually](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=1&mode=live&start=204.104) [integrate one of the several sign-in](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=1&mode=live&start=206.389) [methods that Firebase offers to sign in](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=1&mode=live&start=208.934) [users to your app. Firebase authentication](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=1&mode=live&start=211.587) [allows you to sign up users using their](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=1&mode=live&start=214.63) [emails addresses and passwords. It also](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=1&mode=live&start=216.811) [supports federated identity providers,](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=1&mode=live&start=220.0628) [such as Google, Facebook, Twitter, and](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=1&mode=live&start=222.08520000000001) [GitHub. You can also authenticate users](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=1&mode=live&start=224.86733333333333) [using their phone number, integrate custom](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=1&mode=live&start=226.85228571428578) [authentication methods, as well as use](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=1&mode=live&start=229.893) [anonymous authentication. You should be](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=1&mode=live&start=232.091) [aware of all of these options when you](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=1&mode=live&start=234.08633333333336) [develop on Firebase, however, we are](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=1&mode=live&start=236.4346666666667) [focused on Cloud Firestore, and we are](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=1&mode=live&start=238.91600000000003) [focused on security rules that allow you](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=1&mode=live&start=241.44475) [to configure granular access to the data](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=1&mode=live&start=243.72) [that you store in Firestore. Security](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=1&mode=live&start=245.82585714285713) [rules on Cloud Firestore are an access](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=1&mode=live&start=247.87285714285713) [control and data validation mechanism,](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=1&mode=live&start=250.50240000000002) [which has a very simple, expressive format](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=1&mode=live&start=252.5625) [that you can use to secure your data.](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=1&mode=live&start=255.49671428571426) [These are simple rules that you configure](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=1&mode=live&start=258.99042857142865) [on the Firestore console, and they allow](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=1&mode=live&start=261.6385000000001) [granular specification of who can read and](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=1&mode=live&start=263.8468000000001) [write data under what conditions. All of](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=1&mode=live&start=266.8177142857142) [the demos that follow this clip will show](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=1&mode=live&start=270.86075000000005) [you how you can write security rules with](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=1&mode=live&start=272.63325000000003) [different conditions, and even function](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=1&mode=live&start=275.379) [specifications. Once these security rules](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=1&mode=live&start=277.87949999999995) [are written, we'll see how we can test](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=1&mode=live&start=280.1766666666666) [these rules out using the Firestore](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=1&mode=live&start=282.55633333333327) [simulator. We'll then deploy these rules](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=1&mode=live&start=284.72425) [and see some examples of how we can test](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=1&mode=live&start=286.8328750000001) [these rules using the Firebase command line interface.](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=1&mode=live&start=289.6615)

[Testing Security Rules Using the Firestore Simulator](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=2&mode=live)

[We've already briefly worked with security](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=2&mode=live&start=0.75) [rules earlier. In this demo, let's get](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=2&mode=live&start=3.024) [formally introduced to them. Here we are](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=2&mode=live&start=5.863) [logged into our Firebase console. Click on](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=2&mode=live&start=8.370125) [the Database link to the left in order to](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=2&mode=live&start=10.31177777777778) [head over to Cloud Firestore. We spent](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=2&mode=live&start=12.837142857142856) [most of our time in the previous module in](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=2&mode=live&start=15.75311111111111) [the Data tab. This time we'll head over to](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=2&mode=live&start=17.651600000000002) [Rules, which is where we configure the](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=2&mode=live&start=20.262714285714292) [security rules for our client](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=2&mode=live&start=22.10100000000001) [applications. Here is the default rule](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=2&mode=live&start=24.345799999999993) [that we had set up earlier when we were](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=2&mode=live&start=25.921500000000005) [running queries and updating documents in](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=2&mode=live&start=28.327857142857138) [our collections. You can see the match](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=2&mode=live&start=30.6862) [option here, which specifies all documents](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=2&mode=live&start=33.17785714285714) [within all collections within Cloud](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=2&mode=live&start=35.60433333333332) [Firestore. And our rule here simply says](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=2&mode=live&start=38.86125) [that all client applications have full](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=2&mode=live&start=41.11649999999999) [read and write access. Let's switch this](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=2&mode=live&start=43.02666666666668) [over to be if false, that means read and](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=2&mode=live&start=45.71324999999999) [write access is always denied. Publish](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=2&mode=live&start=48.759000000000015) [this new rule, and let's see how this](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=2&mode=live&start=50.999249999999996)[works. You can see the time at which this](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=2&mode=live&start=52.87211111111111) [new rule was applied to the left, and you](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=2&mode=live&start=55.575624999999995) [can see that published changes can take up](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=2&mode=live&start=58.04314285714286) [to a minute to propagate, so wait for a](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=2&mode=live&start=60.02375) [minute or so before you use the simulator](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=2&mode=live&start=62.11) [to test out this rule. An important thing](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=2&mode=live&start=64.29228571428571) [for you to understand about the simulator](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=2&mode=live&start=66.97942857142857) [that Firestore offers in order to test out](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=2&mode=live&start=69.05599999999998) [your security rules, is the fact that it](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=2&mode=live&start=71.47525000000002) [does not run against actual data that is](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=2&mode=live&start=73.93322222222224) [stored in your Firestore database. The](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=2&mode=live&start=76.30814285714288) [simulator will simply simulate the](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=2&mode=live&start=79.61266666666667) [operation that you specify, whether it's a](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=2&mode=live&start=81.921) [get, create, update or delete, and try and](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=2&mode=live&start=83.925) [see whether your rules allow this](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=2&mode=live&start=86.311) [operation. It will not modify data, it](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=2&mode=live&start=88.42128571428569) [will not run against actual data. Here I](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=2&mode=live&start=90.29299999999998) [specified a get operation on the](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=2&mode=live&start=93.1725)[restaurants collection, and I've](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=2&mode=live&start=94.701) [explicitly specified rest\_01. The rest\_01](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=2&mode=live&start=97.21380000000002) [can be anything, because it's not running](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=2&mode=live&start=100.00066666666665) [against the actual data, it can be any ID.](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=2&mode=live&start=102.81416666666668) [Let's run the simulation and see whether](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=2&mode=live&start=106.466) [we can retrieve data from the restaurants](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=2&mode=live&start=108.55112500000003) [collection based on the security rules](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=2&mode=live&start=110.941) [that we have just configured. When you hit](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=2&mode=live&start=112.77957142857142) [Run, you'll find that simulated read has](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=2&mode=live&start=115.21657142857143) [been denied. The rule that denied this](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=2&mode=live&start=117.97739999999999) [operation is the security rule that is](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=2&mode=live&start=120.55925000000002)[highlighted here on screen. This is the](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=2&mode=live&start=122.81350000000002) [allow, read, write, if false. In this](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=2&mode=live&start=125.33774999999999) [particular instance, we can test this rule](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=2&mode=live&start=127.77085714285715) [out using one of our existing queries.](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=2&mode=live&start=129.84477777777778) [Open up the firestore\_queries.js file,](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=2&mode=live&start=132.231) [this is a file that we had created](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=2&mode=live&start=135.255) [earlier, and uncomment out a single get](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=2&mode=live&start=136.9430000000001) [request, getItalianRestaurants. This is](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=2&mode=live&start=139.836) [the only request that I'm uncommenting](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=2&mode=live&start=141.9041428571429) [here. This is a very simple get query on](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=2&mode=live&start=143.3027142857143) [the restaurants collection. Save this](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=2&mode=live&start=146.86899999999997)[file, and execute this on your terminal](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=2&mode=live&start=148.68325) [window, and you'll find that this throws](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=2&mode=live&start=150.758) [an error, missing or insufficient](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=2&mode=live&start=152.93266666666665) [permissions. This gives you a very clear](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=2&mode=live&start=154.866) [idea of how the security rules affect your](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=2&mode=live&start=157.42) [web and mobile applications. Let's go back](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=2&mode=live&start=160.323) [to our Rules console here, and change the](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=2&mode=live&start=163.61875) [allow read, write: if false, to true. That](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=2&mode=live&start=165.99850000000004) [means read and write is always allowed to](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=2&mode=live&start=168.4275) [all collections within Firestore. Publish](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=2&mode=live&start=171.39357142857142) [this rule, and once this rule has been](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=2&mode=live&start=173.70987499999998)[updated you can run the simulation, and](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=2&mode=live&start=175.85957142857143) [you'll find that the simulated read is now](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=2&mode=live&start=177.91557142857144) [allowed. An exercise you can do on your](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=2&mode=live&start=180.3055) [own is to switch over to your web](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=2&mode=live&start=182.8064) [application now and see whether the get](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=2&mode=live&start=184.476) [query runs successfully. You'll find that it will.](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=2&mode=live&start=186.559)

[Applying Rules to Collections](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=3&mode=live)

[The rule that we currently have is pretty](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=3&mode=live&start=0.568) [broad. We allow read, as well as write](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=3&mode=live&start=3.6542222222222223) [access, to all users. Let's change this](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=3&mode=live&start=5.708624999999998) [rule a little bit for more granular](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=3&mode=live&start=7.779249999999998) [specification. The match specification](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=3&mode=live&start=10.824166666666667) [here indicates that the rule applies to](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=3&mode=live&start=12.336) [documents in our Firestore database, but](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=3&mode=live&start=14.214142857142857) [this time we specify the security rules](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=3&mode=live&start=16.0895) [only for the users collection. Users](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=3&mode=live&start=18.808999999999994) [collection for any document within users,](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=3&mode=live&start=21.815) [we want to allow read, but disallow](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=3&mode=live&start=24.89857142857143) [writes. Go ahead and publish this more](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=3&mode=live&start=28.274) [granular rule, and let's run our first](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=3&mode=live&start=30.596285714285724) [simulation. Observe that this simulation](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=3&mode=live&start=33.23171428571429) [is for the restaurants collection, not for](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=3&mode=live&start=34.876142857142845)[users. And when you hit Run, you'll find](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=3&mode=live&start=38.33359999999999) [that this read is denied. That's because](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=3&mode=live&start=40.32877777777777) [we've specified a security rule allowing](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=3&mode=live&start=42.65316666666668) [read access only to the users collection.](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=3&mode=live&start=45.02083333333333) [There is no specification for the](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=3&mode=live&start=47.508) [restaurants collection, which means read](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=3&mode=live&start=49.279) [and write access to restaurants is denied](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=3&mode=live&start=50.77) [by default. Let's change the get request](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=3&mode=live&start=53.384) [from restaurants to the users collection.](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=3&mode=live&start=55.822) [The ID that you specify for the user can](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=3&mode=live&start=58.733) [be any ID. Remember the simulator does not](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=3&mode=live&start=60.7) [actually retrieve data for your database,](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=3&mode=live&start=63.49283333333334) [so this can be any ID, a fictitious one.](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=3&mode=live&start=65.21328571428572) [The simulator will only check to see](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=3&mode=live&start=68.3247142857143) [whether this get action on users will](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=3&mode=live&start=70.779625) [work. Hit Run, and you'll see that this](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=3&mode=live&start=72.9425) [simulated read was allowed. This is](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=3&mode=live&start=76.03566666666667) [because of the allow read: if true](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=3&mode=live&start=78.16344444444444) [statement, and that's the rule that is](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=3&mode=live&start=80.097) [highlighted here on screen. Let's now](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=3&mode=live&start=81.84) [simulate a create operation on the users](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=3&mode=live&start=84.14042857142857) [collection. We'll switch the simulation](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=3&mode=live&start=87.01033333333332) [type to create, and specify a dummy value,](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=3&mode=live&start=88.7752857142857) [which is ignored by the simulator. We can](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=3&mode=live&start=91.202875) [build a document here for the create](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=3&mode=live&start=93.80650000000003) [operation, so use this build document and](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=3&mode=live&start=96.31250000000003)[specify some field values for this](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=3&mode=live&start=98.83299999999998) [document. These are just values that will](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=3&mode=live&start=101.06674999999998) [be used by the simulated create command.](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=3&mode=live&start=103.03499999999998) [Click on Done here, and run the](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=3&mode=live&start=105.774) [simulation, and you'll find that this is](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=3&mode=live&start=108.31325000000004) [denied. Our rule says that writes to the](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=3&mode=live&start=110.93457142857146) [users collection are not allowed under any](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=3&mode=live&start=113.79600000000003) [condition. Let's try and update simulation](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=3&mode=live&start=116.75757142857141) [on the users collection. All of the other](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=3&mode=live&start=118.57557142857145) [values are dummy values. Simply hit Run,](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=3&mode=live&start=121.2495714285714) [and you'll find that this has been denied](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=3&mode=live&start=123.741) [as well because write is not allowed.](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=3&mode=live&start=125.428) [Similarly, if you try to run the delete](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=3&mode=live&start=128.658) [simulation, that will not work as well. In](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=3&mode=live&start=131.09) [this way, you can quickly use the](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=3&mode=live&start=134.0835)[simulator to test the security rules that](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=3&mode=live&start=135.641) [you want to set up, and once you're happy](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=3&mode=live&start=137.899) [with the rules as you've configured them,](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=3&mode=live&start=140.482) [you can test them out on your real web](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=3&mode=live&start=142.2) [application. We have a number of CRUD](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=3&mode=live&start=145.69019999999998) [operations specified in the](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=3&mode=live&start=147.23428571428573) [firestore\_crud.js file. I'm going to open](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=3&mode=live&start=149.1046) [up this file and uncomment the](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=3&mode=live&start=150.94300000000004) [addSingleUserDoc function. This is the](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=3&mode=live&start=153.5335) [function which adds just a single user to](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=3&mode=live&start=156.07375000000002) [the users collection. You can comment out](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=3&mode=live&start=158.07150000000001) [all of the other method invocations in](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=3&mode=live&start=159.83949999999996) [this file. Save these changes and execute](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=3&mode=live&start=162.211) [this file, and you'll find that we have](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=3&mode=live&start=164.76885714285717) [insufficient permissions for this](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=3&mode=live&start=167.47114285714284)[operation. That's because write operations](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=3&mode=live&start=169.02299999999997) [are not allowed to the users collection.](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=3&mode=live&start=170.78766666666667) [Switch back to editing the](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=3&mode=live&start=173.641) [firestore\_crud.js file, comment out the](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=3&mode=live&start=174.892) [function for addSingleUserDoc, and let's](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=3&mode=live&start=177.396) [perform the read operation instead.](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=3&mode=live&start=180.2807142857143) [Uncomment the readAllUsers function. Make](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=3&mode=live&start=182.645) [sure you comment out the invocations to](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=3&mode=live&start=185.4385) [all other functions in this file so that](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=3&mode=live&start=187.21557142857142) [only the readAllUsers function is](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=3&mode=live&start=189.69171428571428) [executed. This is a read operation on the](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=3&mode=live&start=191.509625) [users collection. Save this file, and](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=3&mode=live&start=194.23766666666666) [execute this on your terminal window, and](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=3&mode=live&start=196.10099999999994) [you'll find that this operation is](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=3&mode=live&start=198.13457142857143) [successful. We just have a single user in](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=3&mode=live&start=200.44333333333336) [our collection, and the ID of that user](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=3&mode=live&start=202.330625) [has been printed to screen. Our security](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=3&mode=live&start=204.54149999999996) [rules allow reads, but not writes, and](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=3&mode=live&start=207.26500000000001) [that is reflected when we access data using our client application.](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=3&mode=live&start=209.84149999999997)

[Applying Collection-specific Granular Rules](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=4&mode=live)

[In this demo, we'll see examples of how we](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=4&mode=live&start=0.166) [can write more granular security rules to](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=4&mode=live&start=3.298142857142857) [control access to collections](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=4&mode=live&start=5.808833333333333) [individually. If you have multiple](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=4&mode=live&start=8.096166666666665)[collections within your Firestore](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=4&mode=live&start=9.732666666666667) [database, which is typically the case,](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=4&mode=live&start=10.928333333333335) [you'll want to configure your security](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=4&mode=live&start=12.846142857142857) [rules separately for each collection. Here](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=4&mode=live&start=14.889666666666667) [is the first set of security rules that](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=4&mode=live&start=17.9335) [apply to the users collection as specified](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=4&mode=live&start=19.7775) [by the match clause here. We want to allow](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=4&mode=live&start=22.27128571428571) [access to individual users, but we don't](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=4&mode=live&start=25.577142857142864) [want client applications to be able to](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=4&mode=live&start=27.851333333333333) [list all users in the database. Allow get](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=4&mode=live&start=29.966500000000007) [is if true, which means it will always be](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=4&mode=live&start=32.938624999999995) [allowed, and allow list is if false, which](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=4&mode=live&start=35.82757142857143) [means it'll always be disallowed. Here are](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=4&mode=live&start=38.502) [a different set of rules that apply to](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=4&mode=live&start=41.5975) [documents that lie within the restaurants](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=4&mode=live&start=43.52242857142858) [collection. Here is a match statement for](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=4&mode=live&start=45.873999999999995) [restaurants, and here we want to allow](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=4&mode=live&start=48.004428571428555) [just updates to existing documents. We do](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=4&mode=live&start=50.20533333333333) [not want to allow creation or deletion of](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=4&mode=live&start=52.74825) [documents. All of the rules that we set up](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=4&mode=live&start=55.46466666666667) [from now onwards we'll try using just the](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=4&mode=live&start=57.276222222222195) [simulator. Go ahead and publish this rule,](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=4&mode=live&start=60.28212499999999) [and let's use the simulator to simulate a](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=4&mode=live&start=62.396) [get request to the users collection. This](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=4&mode=live&start=65.09100000000001) [get operation is for a specific document](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=4&mode=live&start=67.65457142857143) [within the users collection. Remember that](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=4&mode=live&start=69.9756) [this document need not exist. The](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=4&mode=live&start=72.29085714285713) [simulator is not running against the](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=4&mode=live&start=74.65171428571429) [actual data stored in Firestore. Hit Run,](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=4&mode=live&start=76.144)[and you can see that the simulated read](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=4&mode=live&start=78.77466666666666) [was allowed. We have an explicit security](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=4&mode=live&start=81.28914285714286) [rule that says get operations on](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=4&mode=live&start=83.95442857142856) [individual documents are allowed. Let's](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=4&mode=live&start=86.117) [try creating a new document. So we](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=4&mode=live&start=88.11433333333333) [simulate the create, we build a new](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=4&mode=live&start=90.3005) [document which will be passed into this](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=4&mode=live&start=92.26328571428571) [create operation. The name is just Sarah.](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=4&mode=live&start=94.87166666666667) [Click on Done here, and execute this](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=4&mode=live&start=97.481) [simulated create operation, and this is](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=4&mode=live&start=100.245) [denied. The security rules have no](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=4&mode=live&start=104.02414285714289) [specification for creation operations on](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=4&mode=live&start=106.2306666666667) [the users collection, which means it's](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=4&mode=live&start=108.13133333333333) [denied by default. You can try executing](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=4&mode=live&start=110.98685714285713) [an update operation on the users](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=4&mode=live&start=113.85914285714286)[collection. You'll find that that will be](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=4&mode=live&start=115.86025000000001) [denied as well. The delete operation on](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=4&mode=live&start=117.79599999999999) [the users collection will also be denied.](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=4&mode=live&start=119.72399999999999) [You can only perform get. We can now move](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=4&mode=live&start=122.666) [on and test out the security rules that we](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=4&mode=live&start=125.81377777777777) [specified for the restaurants collection.](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=4&mode=live&start=128.07985714285715) [Switch over the collection to be](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=4&mode=live&start=130.277) [restaurants. You can specify any](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=4&mode=live&start=132.4507142857143) [restaurant ID. It may not be an actual ID](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=4&mode=live&start=134.13766666666663) [present in your database. We'll first try](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=4&mode=live&start=136.45511111111102) [a get operation on the restaurants](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=4&mode=live&start=138.73442857142857) [collection, and our security rules have no](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=4&mode=live&start=141.15700000000004) [specification for the get operation on](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=4&mode=live&start=143.576) [restaurants, which means it is denied.](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=4&mode=live&start=145.935) [Let's try the create operation that has](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=4&mode=live&start=148.883) [been explicitly denied. Choose the create](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=4&mode=live&start=150.685) [simulation type. We'll build a new](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=4&mode=live&start=153.58399999999997) [document which represents a restaurant.](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=4&mode=live&start=155.39542857142857) [Click on Build document, and specify a](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=4&mode=live&start=156.92366666666666) [name for this restaurant. Run the](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=4&mode=live&start=159.5314285714286) [simulation, and thanks to our explicit](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=4&mode=live&start=161.70685714285713) [security rule, create is not allowed. But](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=4&mode=live&start=163.81071428571428) [our security rule states that updates to](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=4&mode=live&start=168.07914285714287) [existing documents are allowed. Simply](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=4&mode=live&start=170.07979999999998) [call update, and you'll find that that](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=4&mode=live&start=171.91571428571427) [will go through fine. Remember that the](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=4&mode=live&start=173.8584) [simulator does not change the actual](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=4&mode=live&start=176.37657142857142) [contents of the database or work on real](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=4&mode=live&start=178.584) [documents. It simply tests to see whether](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=4&mode=live&start=181.0105) [that operation is allowed. We'll try one](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=4&mode=live&start=183.19580000000002) [last operation here with the delete action](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=4&mode=live&start=185.67374999999998) [on restaurants, and that's not allowed as well.](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=4&mode=live&start=187.996)

[Using Conditional Checks in Security Rules](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=5&mode=live)

[So far our security rules have been pretty](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=5&mode=live&start=0.294) [plain vanilla, either true or false.](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=5&mode=live&start=3.105) [Something is enabled or not. Let's now see](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=5&mode=live&start=5.721) [how we can write security rules based on](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=5&mode=live&start=7.927125000000001) [conditions. Let's say that documents](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=5&mode=live&start=10.348250000000002) [within your restaurants collection had a](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=5&mode=live&start=12.260333333333332) [field called visibility. You could set up](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=5&mode=live&start=14.651) [a conditional rule which says that you](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=5&mode=live&start=17.108428571428576) [allow read access only to those documents](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=5&mode=live&start=19.188285714285715) [where data.visibility is equal to public.](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=5&mode=live&start=21.544166666666673) [Resource here refers to the actual data](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=5&mode=live&start=25.128)[present in Cloud Firestore. This is an](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=5&mode=live&start=27.874) [individual document that you're trying to](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=5&mode=live&start=30.756571428571426) [access within the restaurants collection.](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=5&mode=live&start=32.47542857142857) [Because this rule depends on the condition](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=5&mode=live&start=34.854) [that applies to actual data stored in](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=5&mode=live&start=36.805) [Cloud Firestore, this is not easily](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=5&mode=live&start=38.81750000000001) [testable using the simulator. Go ahead and](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=5&mode=live&start=40.995) [publish this rule, and if you try to](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=5&mode=live&start=43.25) [perform a get operation on any restaurant](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=5&mode=live&start=45.388) [here, you'll find that you'll always get](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=5&mode=live&start=47.93033333333334) [simulated write denied. The simulator does](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=5&mode=live&start=51.076) [not run against actual data stored in](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=5&mode=live&start=53.419) [Cloud Firestore, which means you can't](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=5&mode=live&start=55.675200000000004) [test this rule out here. This is a](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=5&mode=live&start=57.46777777777779) [security rule that you need to test with](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=5&mode=live&start=59.44) [real data and a real client application.](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=5&mode=live&start=61.54755555555556) [You already know all of the building](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=5&mode=live&start=64.619) [blocks in order to set this up, so I'll](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=5&mode=live&start=66.12224999999997) [leave that as an exercise for you. The](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=5&mode=live&start=67.94588888888894)[important thing that you should observe](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=5&mode=live&start=70.07314285714286) [here is that you have the ability to set](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=5&mode=live&start=71.874) [up conditions based on actual field values](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=5&mode=live&start=74.01959999999998) [stored in your documents. With the same](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=5&mode=live&start=76.811) [conditional rule in place, let's try an](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=5&mode=live&start=79.38314285714287) [update operation. Updates require that you](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=5&mode=live&start=82.0484) [pass in a document. Let's use the build](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=5&mode=live&start=84.36250000000003)[document dialog here to set up a new](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=5&mode=live&start=87.25042857142856) [restaurant document, name is Pizza Place.](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=5&mode=live&start=89.52028571428573) [Hit Run, and you'll find that thanks to](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=5&mode=live&start=91.683) [our security rules, write operations are](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=5&mode=live&start=93.412) [denied. We only allow reads if the](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=5&mode=live&start=96.91085714285717) [resource visibility is public. This is an](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=5&mode=live&start=99.50657142857139) [example of a condition based on actual](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=5&mode=live&start=102.57899999999998) [value of data stored within Cloud](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=5&mode=live&start=104.62542857142857) [Firestore. Next, let's take a look at how](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=5&mode=live&start=106.692) [we can set up a conditional check based on](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=5&mode=live&start=109.471) [the incoming request values. Conditional](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=5&mode=live&start=112.396) [checks on incoming requests can be tested](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=5&mode=live&start=115.4166) [within the simulator, so we'll be able to](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=5&mode=live&start=118.33300000000001) [see results right here. We have a security](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=5&mode=live&start=120.85244444444442) [rule here that applies to the restaurants](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=5&mode=live&start=123.14249999999998) [collection, where we allow updates only if](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=5&mode=live&start=125.75949999999997) [the incoming request resource data has an](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=5&mode=live&start=128.3205) [average rating greater than 0. This is a](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=5&mode=live&start=131.18816666666666) [check that can confirm that our updates on](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=5&mode=live&start=133.99333333333334) [average ratings are clean. Average ratings](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=5&mode=live&start=136.50866666666667) [should be greater than 0 for the updates](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=5&mode=live&start=139.4025714285714) [to go through. This is a check on the](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=5&mode=live&start=141.96050000000002) [incoming updated fields, because we check](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=5&mode=live&start=144.78775000000007) [whether request.resource .data .avgRating](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=5&mode=live&start=146.86319999999998) [greater than 0. The request variable is](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=5&mode=live&start=149.70000000000005) [what we use to access the data passed into](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=5&mode=live&start=152.92049999999998) [this operation. Go ahead and publish these](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=5&mode=live&start=155.91371428571435) [updated security rules, and let's build a](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=5&mode=live&start=158.58771428571436) [document that we'll pass in to the update](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=5&mode=live&start=161.23971428571423) [operation that we plan to simulate. Here](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=5&mode=live&start=164.12100000000007) [the name is Pizza Place, and the average](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=5&mode=live&start=166.7275) [rating is 3.5, which is greater than 0,](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=5&mode=live&start=168.98000000000002) [which means that when we run the](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=5&mode=live&start=171.22812499999998) [simulation this operation should be](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=5&mode=live&start=173.4424) [allowed, and yes, indeed, it is. This is](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=5&mode=live&start=175.61519999999996) [because the average rating of the data](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=5&mode=live&start=178.75549999999998) [that we passed in was greater than 0.](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=5&mode=live&start=180.87777777777777) [Here's a little more practice for you. Try](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=5&mode=live&start=183.468) [and build a document which you pass in](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=5&mode=live&start=185.9798888888889) [with the operation where the average](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=5&mode=live&start=187.891) [rating is a negative value, and see if](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=5&mode=live&start=190.182) [that goes through. It won't. Let's see an](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=5&mode=live&start=191.9268888888889) [example of a more complicated conditional](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=5&mode=live&start=194.4995) [check within our security rule. Here, we](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=5&mode=live&start=196.46366666666665) [are using the logical and operation to](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=5&mode=live&start=199.70885714285714) [build up a more complex check. When we](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=5&mode=live&start=202.19099999999997) [update the document that corresponds to a](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=5&mode=live&start=204.95466666666664) [single restaurant, we want to ensure that](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=5&mode=live&start=207.23179999999996) [the average rating that we have specified](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=5&mode=live&start=209.76375000000004) [as a part of our update is greater than 0,](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=5&mode=live&start=211.57144444444447) [and the additional check is to ensure that](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=5&mode=live&start=214.382) [the update does not change the name of the](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=5&mode=live&start=216.539) [restaurant. The restaurant name in the](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=5&mode=live&start=219.28310000000002) [incoming request data is the same as the](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=5&mode=live&start=221.50728571428576) [existing name that is present in Cloud](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=5&mode=live&start=224.2176666666666) [Firestore. Because we can't access actual](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=5&mode=live&start=226.78900000000002) [Cloud Firestore data in the simulator, we](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=5&mode=live&start=228.9581666666667) [can't really test this rule out using the](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=5&mode=live&start=231.63075) [simulator, but we'll do something tricky](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=5&mode=live&start=233.7205) [you'll see in a bit. Publish this rule,](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=5&mode=live&start=235.37199999999999) [and let's run an update operation, and](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=5&mode=live&start=237.1647142857143) [you'll find that the update is denied. The](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=5&mode=live&start=239.39385714285712) [document that we passed in as a part of](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=5&mode=live&start=242.1315714285714) [this operation had an average rating of](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=5&mode=live&start=245.11925000000002) [3.5, which is greater than 0, so this](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=5&mode=live&start=247.6686666666667)[condition was satisfied, however, because](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=5&mode=live&start=249.96712500000007) [the simulator does not actually run](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=5&mode=live&start=252.1042857142857) [against actual values in Firestore, we](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=5&mode=live&start=253.96) [were unable to check the resource data](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=5&mode=live&start=256.9266666666667) [name. A way to quickly test the security](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=5&mode=live&start=259.7663333333333) [rule out in the simulator is to hardcode](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=5&mode=live&start=262.02262499999983) [the value that we assume is in the](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=5&mode=live&start=264.5865000000001) [Firestore database. For this demo, let's](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=5&mode=live&start=267.5407777777777) [assume that the resource that is present](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=5&mode=live&start=269.60071428571433) [in Firestore has the restaurant name Pizza](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=5&mode=live&start=272.0938571428571) [Place, so only if the incoming update](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=5&mode=live&start=275.23339999999996) [request does not change the name of this](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=5&mode=live&start=277.79075) [restaurant, will the update be accepted.](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=5&mode=live&start=281.75457142857147) [Our document contains the name Pizza](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=5&mode=live&start=284.099) [Place, so if you publish this rule and run](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=5&mode=live&start=286.57957142857157) [the simulation, you'll find that the](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=5&mode=live&start=289.0498888888888) [simulated write will be successful. The](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=5&mode=live&start=291.15783333333326) [document that we passed in as a part of](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=5&mode=live&start=294.16855555555554) [the incoming request for this update](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=5&mode=live&start=296.30414285714284) [operation had the name Pizza Place, that's](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=5&mode=live&start=297.955) [what we assumed was in the Firestore](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=5&mode=live&start=300.40866666666665) [database. That's why this update was](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=5&mode=live&start=303.11533333333324) [successful. If you try and run this update](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=5&mode=live&start=305.8428333333333) [operation with a new document name which](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=5&mode=live&start=308.46262499999983) [is not equal to Pizza Place, the simulated write will fail.](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=5&mode=live&start=310.4904999999999)

[Checking for Authenticated Users](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=6&mode=live)

[If you want your Firestore data to be only](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=6&mode=live&start=0.105) [accessible to authenticated users, those](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=6&mode=live&start=3.278) [who have signed in using some kind of](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=6&mode=live&start=5.201555555555556) [credentials to your web application, you](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=6&mode=live&start=7.214) [can also set up your security rules to](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=6&mode=live&start=9.568444444444445) [check for authenticated users. Here is an](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=6&mode=live&start=11.82) [example of a rule where read and write](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=6&mode=live&start=15.308666666666669) [access to the restaurants collection is](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=6&mode=live&start=17.70133333333333) [only available to authenticated users. So](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=6&mode=live&start=20.2888) [we match the restaurants collection, allow](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=6&mode=live&start=23.6915) [read and write only if the request.auth](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=6&mode=live&start=25.123285714285714) [.uid is not equal to null. If the users of](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=6&mode=live&start=27.373142857142856) [your mobile or web application are](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=6&mode=live&start=31.859000000000005) [authenticated, request.auth .uid will have](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=6&mode=live&start=34.092) [a valid value. It will not be equal to](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=6&mode=live&start=36.62657142857143) [null, thus we ensure that reads and writes](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=6&mode=live&start=39.25928571428573) [are only allowed for authenticated users.](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=6&mode=live&start=41.04287499999999) [Let's simulate a get operation here, and](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=6&mode=live&start=43.988) [we simply run without specifying that the](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=6&mode=live&start=46.89514285714286) [user is authenticated. Observe that this](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=6&mode=live&start=49.79875) [read operation fails. That's because we](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=6&mode=live&start=52.58800000000001) [were not authenticated when we made this](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=6&mode=live&start=55.235) [request, and we can check this using the](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=6&mode=live&start=57.344) [simulator. Now use this Authenticated](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=6&mode=live&start=59.70259999999999) [slider, and switch over so that the](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=6&mode=live&start=61.981600000000014) [incoming request appears as though from an](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=6&mode=live&start=64.80157142857144) [authenticated user. You can use these](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=6&mode=live&start=67.101) [additional fields to specify your auth](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=6&mode=live&start=69.58085714285717) [provider. For now, let's assume it's](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=6&mode=live&start=71.71149999999999)[google.com. You can also specify a](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=6&mode=live&start=73.84649999999998) [Firebase UID, an email address, a phone](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=6&mode=live&start=76.03157142857145) [number, or other kinds of authentication](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=6&mode=live&start=78.36233333333337) [for your incoming user request. This](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=6&mode=live&start=80.07814285714284) [simulator will simulate an authentication](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=6&mode=live&start=83.283) [payload as will appear from a real request](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=6&mode=live&start=85.45580000000001) [from your client applications. Click on](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=6&mode=live&start=88.5325) [Run here, and you'll find that this read](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=6&mode=live&start=90.54874999999998) [is successful. Once you have authenticated](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=6&mode=live&start=93.569) [users who have access to your data, your](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=6&mode=live&start=96.06442857142855) [security rules can be more interesting and](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=6&mode=live&start=98.72385714285717) [more specific. Let's set up a security](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=6&mode=live&start=101.48485714285715) [rule on the users collection. This applies](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=6&mode=live&start=103.6418888888889) [to documents with a specific userId. Now](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=6&mode=live&start=106.19380000000001) [we want users to have read, update, and](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=6&mode=live&start=110.24249999999999) [delete access only for their own](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=6&mode=live&start=112.967875) [information. So we allow this access only](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=6&mode=live&start=116.57312500000002) [if the incoming request.auth .uid is equal](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=6&mode=live&start=118.65900000000002)[to the userId. We want to allow any](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=6&mode=live&start=121.744) [authenticated user of our application to](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=6&mode=live&start=125.589) [create other users, so if request.auth](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=6&mode=live&start=127.882) [.uid is not null, we allow user creation.](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=6&mode=live&start=131.27371428571433) [Go ahead and publish this new set of](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=6&mode=live&start=134.432) [security rules that applies to the users](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=6&mode=live&start=137.016) [collection. Let's first try a create](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=6&mode=live&start=140.14674999999997) [operation that is allowed for all](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=6&mode=live&start=141.65462500000007) [authenticated users. Within this](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=6&mode=live&start=144.09220000000002) [simulator, we'll try and create a dummy](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=6&mode=live&start=145.90757142857143) [user with ID user01. We are authenticated,](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=6&mode=live&start=148.8903333333333) [as you can see by the blue slider here,](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=6&mode=live&start=152.3413333333333) [and let's go ahead and run the simulation.](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=6&mode=live&start=154.5035) [The simulation will be allowed. Within the](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=6&mode=live&start=157.95) [simulation, we've successfully created a](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=6&mode=live&start=160.70333333333332) [new user, user01. Let's now run a](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=6&mode=live&start=163.2202857142857) [simulation for a get operation on user01,](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=6&mode=live&start=166.1135) [and remember, this is the user that we](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=6&mode=live&start=168.7146) [just created within the simulation, and](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=6&mode=live&start=171.23325000000003) [our Firebase UID is user01. Hit Run, and](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=6&mode=live&start=173.35133333333334) [you'll find that this operation is](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=6&mode=live&start=177.54549999999995) [successful. That's because the incoming](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=6&mode=live&start=180.9994) [UID that we specified was user01, which is](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=6&mode=live&start=182.63042857142858) [equal to the userId of the data that we](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=6&mode=live&start=185.64114285714288) [are trying to access. As per our security](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=6&mode=live&start=188.78322222222215) [rules, users have get access to their own](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=6&mode=live&start=192.0344285714285) [data. Let's now try an update operation on](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=6&mode=live&start=195.55774999999997) [user01, as user01, and you'll find that](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=6&mode=live&start=197.981) [this simulation succeeds as well. Users](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=6&mode=live&start=201.877) [can update their own information. Let's](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=6&mode=live&start=204.57783333333333)[now try a delete operation on user01, as](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=6&mode=live&start=206.63814285714287) [user01, and this is allowed as well. But](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=6&mode=live&start=209.24877777777778) [change your Firebase UID to user02, or](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=6&mode=live&start=213.202) [some other value, and you'll find that you](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=6&mode=live&start=216.00537500000002) [can't update or delete or read the data for user01.](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=6&mode=live&start=219.032875)

[Defining and Using Functions within Security Rules](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=7&mode=live)

[In this demo, we'll see an example of how](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=7&mode=live&start=0.081) [we can define and use functions within our](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=7&mode=live&start=2.594) [security rules. Here is a security rule](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=7&mode=live&start=5.156) [that checks to see whether a user is](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=7&mode=live&start=8.15111111111111) [authenticated before allowing the user](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=7&mode=live&start=10.739333333333331) [read or write access to the restaurants,](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=7&mode=live&start=12.360624999999999) [as well as the users collection. We wrap](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=7&mode=live&start=14.641250000000001) [this conditional check into a function](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=7&mode=live&start=17.693571428571428) [that we define within the security rule,](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=7&mode=live&start=19.5125) [signed in or public. We return true, that](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=7&mode=live&start=21.875) [is a user is signed in if the incoming](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=7&mode=live&start=24.674111111111117) [request has a UID that is not equal to](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=7&mode=live&start=26.836111111111105) [null. Once we've defined a function, we](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=7&mode=live&start=29.528399999999998) [can then invoke this function from within](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=7&mode=live&start=31.417499999999997) [different sets of security rules. Here are](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=7&mode=live&start=33.90566666666667) [the rules that apply to the restaurants](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=7&mode=live&start=36.09325) [collection, allow read and write if the](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=7&mode=live&start=37.5316) [user is signed in. Similarly, we want to](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=7&mode=live&start=40.08914285714287) [allow read and write access to the users](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=7&mode=live&start=42.70800000000001) [collection only for authenticated users](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=7&mode=live&start=45.09371428571429) [when they are signed in. Observe how we](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=7&mode=live&start=46.785142857142866) [invoke the function just like any other](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=7&mode=live&start=49.37200000000001) [JavaScript function. Hit Publish to deploy](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=7&mode=live&start=51.716999999999985) [these security rules, and let's run a get](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=7&mode=live&start=53.96999999999999) [simulation on the restaurants collection](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=7&mode=live&start=56.639375) [as a non-authenticated user, a user who is](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=7&mode=live&start=58.394000000000005) [not signed in, and this simulation fails,](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=7&mode=live&start=61.30057142857141) [as expected. Go ahead and use the](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=7&mode=live&start=64.7415) [Authenticated slider in order to simulate](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=7&mode=live&start=67.099) [an authenticated user. This user is](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=7&mode=live&start=69.63871428571427) [authenticated using the google.com](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=7&mode=live&start=71.98799999999999) [provider, and the UID is simply uid.](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=7&mode=live&start=73.38625) [Observe how the simulator mimics the](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=7&mode=live&start=77.28) [authentication payload that will be passed](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=7&mode=live&start=79.47) [in to Cloud Firestore when this request is](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=7&mode=live&start=81.635) [made from a real app. Hit the Run button,](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=7&mode=live&start=84.531) [and you'll find that the simulated read](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=7&mode=live&start=87.43499999999999) [was successful. It was allowed because the](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=7&mode=live&start=89.70660000000001) [user was signed in. You can try this with](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=7&mode=live&start=92.32788888888892) [other CRUD operations such as delete. That](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=7&mode=live&start=94.93600000000002) [will be allowed as well, provided we have](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=7&mode=live&start=97.027) [a valid UID. And this is how you can use](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=7&mode=live&start=99.76299999999999) [security rules to specify very granular](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=7&mode=live&start=102.81011111111113) [access control to your Firestore data. And](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=7&mode=live&start=105.07233333333332) [with this demo, we come to the very end of](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=7&mode=live&start=108.48711111111112) [this module on configuring security rules](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=7&mode=live&start=110.80657142857143) [to access your Cloud Firestore data. These](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=7&mode=live&start=112.79928571428572) [security rules, as we saw, apply to client](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=7&mode=live&start=116.1725) [applications. If you're using the server](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=7&mode=live&start=119.58024999999999) [library to access Firestore data, as you](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=7&mode=live&start=121.56700000000004) [do when you use the web console directly,](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=7&mode=live&start=123.52385714285715) [you need to configure Identity and Access](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=7&mode=live&start=126.229) [Management permissions for Role-based](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=7&mode=live&start=128.57625000000002) [Access Control to Firestore. Access](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=7&mode=live&start=130.4676) [control for mobile and web applications](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=7&mode=live&start=132.92983333333333) [have different mechanisms. They have](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=7&mode=live&start=135.223) [different kinds of control, and this is](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=7&mode=live&start=138.02966666666669) [what you specify using security rules. We](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=7&mode=live&start=140.04985714285712) [saw a bunch of different security rule](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=7&mode=live&start=142.12357142857147) [configurations here in this module. We saw](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=7&mode=live&start=145.64450000000005) [that they can be very granular based on](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=7&mode=live&start=147.94175) [specific operations and specific](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=7&mode=live&start=150.79414285714287) [conditions. You can apply these](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=7&mode=live&start=152.9964285714286) [conditional checks based on data that you](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=7&mode=live&start=154.73499999999999) [have stored within Firestore, or the](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=7&mode=live&start=156.639625) [conditional checks can apply to the](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=7&mode=live&start=158.865) [incoming requests as well. We then saw how](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=7&mode=live&start=161.35485714285716) [we could use the simulator that Cloud](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=7&mode=live&start=163.8711111111111) [Firestore offers to test out these](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=7&mode=live&start=166.09585714285714) [security rules. In the next module, we'll](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=7&mode=live&start=168.742) [take a look at the other realtime database](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=7&mode=live&start=171.02722222222226) [offered by Firebase, that is the Firebase](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=7&mode=live&start=173.43366666666662) [Realtime Database. You'll find that this](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=7&mode=live&start=176.42966666666666) [is extremely powerful and useful, but its](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=7&mode=live&start=178.84916666666666) [functionality is less rich as compared with what Cloud Firestore has to offer.](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=82b6f908-570a-402c-8cc2-b154d27ddbd4&clip=7&mode=live&start=181.99442857142856)

[Using Firebase Realtime Database](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=0&mode=live)

[Module Overview](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=0&mode=live)

[Hi, and welcome to this module on using](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=0&mode=live&start=0) [the Firebase Realtime Database. Now,](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=0&mode=live&start=3.190222222222222) [before Cloud Firestore existed, the](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=0&mode=live&start=6.2208) [realtime database that applications used](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=0&mode=live&start=8.6638) [was the Firebase Realtime Database. This](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=0&mode=live&start=11.329) [was the original storage solution on](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=0&mode=live&start=13.898666666666667) [Firebase. Just like Cloud Firestore, the](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=0&mode=live&start=16.200833333333332) [Realtime Database allows you to hook up](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=0&mode=live&start=19.023857142857143) [change listeners that are constantly](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=0&mode=live&start=21.2365) [listening for updates to the database and](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=0&mode=live&start=23.184) [updating the client applications](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=0&mode=live&start=25.7145)[accordingly. This is what developers](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=0&mode=live&start=27.852500000000006) [originally used in order to keep their](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=0&mode=live&start=30.16433333333333) [data in sync across applications. The](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=0&mode=live&start=32.37744444444444) [Realtime Database is well tested and](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=0&mode=live&start=34.6726) [robust, and in general availability,](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=0&mode=live&start=37.516) [unlike Firestore, so use the Realtime](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=0&mode=live&start=39.533) [Database if you cannot use a product in](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=0&mode=live&start=41.97157142857143) [the beta release. Cloud Firestore is the](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=0&mode=live&start=44.84875000000001) [future, though. It offers a richer data](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=0&mode=live&start=47.50633333333332) [model, richer queries, richer sorting and](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=0&mode=live&start=50.24033333333333) [filtering functionality, which is why](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=0&mode=live&start=53.061) [Google encourages new application](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=0&mode=live&start=55.044) [developers to use Firestore. You choose](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=0&mode=live&start=57.167) [the Realtime Database if you want a robust](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=0&mode=live&start=59.60228571428572) [and well-tested solution, this has been](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=0&mode=live&start=62.563) [around for several years, that is in general availability.](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=0&mode=live&start=64.96671428571429)

[Realtime Database vs. Cloud Firestore](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=1&mode=live)

[Let's quickly understand the general](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=1&mode=live&start=0.75) [similarities and differences between Cloud](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=1&mode=live&start=2.923) [Firestore and the Realtime Database. Cloud](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=1&mode=live&start=4.946833333333333) [Firestore, as you know, is a NoSQL](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=1&mode=live&start=7.41975) [database where data is stored in documents](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=1&mode=live&start=9.266) [that are organized in collections. Each](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=1&mode=live&start=12.067) [document is made up of fields with](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=1&mode=live&start=14.221625)[corresponding values, and these values can](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=1&mode=live&start=16.172) [be simple primitive types, or more complex](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=1&mode=live&start=18.255) [nested types such as maps or lists. The](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=1&mode=live&start=21.152142857142852) [Realtime Database is also a service](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=1&mode=live&start=24.630857142857142) [offered by the Firebase platform, and it's](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=1&mode=live&start=27.078) [a NoSQL database. The data model here is](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=1&mode=live&start=29.968200000000003) [that the data is stored in a JSON format](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=1&mode=live&start=32.739999999999995) [in the form of JSON nodes that can be](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=1&mode=live&start=35.48033333333335) [nested. The Realtime Database, just like](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=1&mode=live&start=38.50000000000001) [Cloud Firestore can sync its data in real](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=1&mode=live&start=40.52966666666666) [time to client applications. The best way](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=1&mode=live&start=43.43487500000001) [to understand how the Realtime Database](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=1&mode=live&start=46.586) [stacks up against Cloud Firestore is to](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=1&mode=live&start=48.187000000000005) [see a side-by-side comparison. The](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=1&mode=live&start=50.88342857142857) [Realtime Database is the original Firebase](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=1&mode=live&start=52.84883333333333) [database. It has been around for over 4](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=1&mode=live&start=55.066857142857145) [years. It's robust and well tested. Cloud](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=1&mode=live&start=58.51575) [Firestore is the new flagship database](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=1&mode=live&start=61.352999999999994)[currently in the beta release. Data in the](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=1&mode=live&start=63.255) [Realtime Database is stored as one large](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=1&mode=live&start=66.32812500000001) [JSON tree. So you have a root node, you](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=1&mode=live&start=69.19649999999999) [have child nodes within this root node,](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=1&mode=live&start=72.15422222222227) [and the fields of child nodes are child](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=1&mode=live&start=74.29350000000001) [nodes themselves. At this point, we are](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=1&mode=live&start=77.54014285714287) [familiar with Cloud Firestore's data](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=1&mode=live&start=79.69425) [model. Documents are organized in](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=1&mode=live&start=81.50833333333333) [collections, and documents are made up of](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=1&mode=live&start=83.69580000000002) [field value pairs. The Realtime Database](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=1&mode=live&start=86.11566666666666) [works very well with simple JSON data,](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=1&mode=live&start=88.15142857142857) [where you have simple fields and the JSON](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=1&mode=live&start=90.86342857142857) [structure gives you a unique path to a](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=1&mode=live&start=93.832) [field. The Cloud Firestore database works](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=1&mode=live&start=96.81200000000003) [with complex hierarchal data, where you](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=1&mode=live&start=99.09833333333333) [can use collections and subcollections to](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=1&mode=live&start=101.60183333333332) [set up hierarchal relationships. The](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=1&mode=live&start=104.01650000000004) [Realtime Database focuses on low latency](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=1&mode=live&start=106.54516666666666)[access. It has limited sorting and](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=1&mode=live&start=108.85733333333334) [filtering functionality, whereas Cloud](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=1&mode=live&start=111.37733333333334) [Firestore offers far richer sorting and](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=1&mode=live&start=113.291) [filtering. The Realtime Database organizes](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=1&mode=live&start=116.05099999999999) [data in the form of a JSON tree, which](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=1&mode=live&start=118.07133333333333) [means queries are deep by default. They](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=1&mode=live&start=120.74957142857143) [always return the entire sub-tree which](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=1&mode=live&start=123.27933333333333) [you have requested. In the case of Cloud](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=1&mode=live&start=125.566) [Firestore, you can construct shallow](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=1&mode=live&start=127.87100000000002) [queries for subcollections. You can query](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=1&mode=live&start=129.58233333333334) [only the subcollections within a document,](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=1&mode=live&start=132.1243333333333) [instead of the entire collection, or even](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=1&mode=live&start=134.502) [an entire document. All queries are](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=1&mode=live&start=137.08319999999998) [indexed by default, which makes for very](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=1&mode=live&start=139.47999999999996) [fast retrieval. The performance of the](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=1&mode=live&start=142.13199999999998) [Realtime Database depends on how much data](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=1&mode=live&start=144.3393333333333) [you have stored in there. The performance](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=1&mode=live&start=146.44937500000003) [depends on the dataset size. In the case](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=1&mode=live&start=148.39571428571423) [of Cloud Firestore, performance is highly](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=1&mode=live&start=151.01271428571425) [optimized. It depends on the result size,](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=1&mode=live&start=153.93019999999996) [the number of results that are returned by](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=1&mode=live&start=156.076) [our query, not on the amount of data](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=1&mode=live&start=158.417) [stored in your database. The Realtime](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=1&mode=live&start=161.207) [Database, just like Cloud Firestore, has](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=1&mode=live&start=163.24366666666668) [support for transactions, however, it's](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=1&mode=live&start=165.5746) [not possible to batch multiple writes](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=1&mode=live&start=167.96099999999998) [together, so the Realtime Database](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=1&mode=live&start=170.24366666666668) [supports only non-atomic writes. Cloud](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=1&mode=live&start=172.30419999999998) [Firestore supports atomic writes, as well](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=1&mode=live&start=174.92100000000002) [as transactions. Scaling the Realtime](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=1&mode=live&start=177.984) [Database requires explicit sharding of](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=1&mode=live&start=180.04219999999998) [your data, whereas with Cloud Firestore](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=1&mode=live&start=182.34959999999998) [scaling is automatic. You simply add your](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=1&mode=live&start=185.09000000000003) [data, Cloud Firestore takes care of the](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=1&mode=live&start=187.86199999999997) [rest. The Realtime Database is a robust](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=1&mode=live&start=189.9151428571428) [and mature product. It's currently in](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=1&mode=live&start=192.55028571428565) [general availability, while Cloud Firestore is in beta.](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=1&mode=live&start=194.85966666666664)

[Introducing the Realtime Database](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=2&mode=live)

[Now that you've understood how the](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=2&mode=live&start=0.75) [Realtime Database is different from Cloud](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=2&mode=live&start=2.282) [Firestore, let's study the Realtime](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=2&mode=live&start=4.703) [Database in some more detail. This is a](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=2&mode=live&start=6.564) [cloud-hosted NoSQL database on Firebase](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=2&mode=live&start=9.914857142857143) [that predates Firestore and is currently](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=2&mode=live&start=12.11225) [in general availability. Data stored in](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=2&mode=live&start=15.271999999999998) [the Realtime Database is stored as JSON,](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=2&mode=live&start=17.330000000000002) [and it's synchronized in real-time to](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=2&mode=live&start=20.079857142857147) [every connected client. That's what gives](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=2&mode=live&start=22.803) [it its name. Let's quickly take a look at](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=2&mode=live&start=25.48)[the key capabilities of the Realtime](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=2&mode=live&start=27.607249999999997) [Database. Instead of typical HTTP requests](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=2&mode=live&start=29.607000000000006) [to retrieve data, you'll hook up](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=2&mode=live&start=32.281666666666666) [listeners. Each time the data changes, all](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=2&mode=live&start=35.38533333333334) [connected devices will receive updates.](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=2&mode=live&start=38.210499999999996) [Just like Cloud Firestore, the Realtime](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=2&mode=live&start=40.603) [Database has support for offline access as](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=2&mode=live&start=42.88366666666666) [well. Data is cached on the client, and](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=2&mode=live&start=45.85925) [can be accessed even when your device is](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=2&mode=live&start=47.76866666666666) [offline. Changes to the data will be](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=2&mode=live&start=50.29542857142858) [updated on your device and will be synced](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=2&mode=live&start=51.998)[to the server once your device reconnects.](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=2&mode=live&start=53.75350000000002) [Data stored in the Realtime Database is](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=2&mode=live&start=56.809) [accessible from multiple client devices.](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=2&mode=live&start=59.258) [That's how data is kept in sync. And](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=2&mode=live&start=62.319) [finally, data can scale across multiple](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=2&mode=live&start=64.34083333333334) [databases. You can shard your data so that](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=2&mode=live&start=67.374) [you use multiple databases, and thus](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=2&mode=live&start=69.91900000000004) [scale. Let's quickly study the data model](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=2&mode=live&start=72.74780000000001) [for the Realtime Database. Data is stored](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=2&mode=live&start=74.85285714285718) [in the form of JSON objects. It's NoSQL,](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=2&mode=live&start=77.19033333333334) [so there are no tables and no records.](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=2&mode=live&start=79.856) [There are no documents and collections as](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=2&mode=live&start=83.66) [well, unlike Cloud Firestore. Any data](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=2&mode=live&start=85.537) [that you add to the Realtime DB becomes a](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=2&mode=live&start=87.77) [node in the JSON tree. Here is an example](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=2&mode=live&start=90.26514285714285) [of a collection of user data as it might](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=2&mode=live&start=93.06433333333332) [be stored in the Realtime Database. You](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=2&mode=live&start=95.79180000000002) [have the users node, under which you have](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=2&mode=live&start=97.91312500000001) [a node for user01, 02, and 03. Every node](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=2&mode=live&start=100.072625) [in this JSON tree is accessible using a](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=2&mode=live&start=103.81200000000001) [specific path. For example, if you want to](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=2&mode=live&start=106.6215) [access the name field for user01, the path](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=2&mode=live&start=108.7185) [is users/user01/name. In order to access](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=2&mode=live&start=111.59814285714283) [the friends field, or the friends node,](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=2&mode=live&start=117.045) [you'll use the path users/user01/friends.](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=2&mode=live&start=119.824) [When we use the Realtime Database in our](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=2&mode=live&start=125.692) [demos, you'll find that we always read and update data using these location paths.](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=2&mode=live&start=127.196)

[Exploring the Realtime Database Using the Web Console](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=3&mode=live)

[In this demo, let's get hands-on with the](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=3&mode=live&start=0.75) [Firebase Realtime Database, which we'll](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=3&mode=live&start=2.892) [access using the Firebase web console.](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=3&mode=live&start=5.57975) [Here we are logged into our](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=3&mode=live&start=8.189) [spikey-firestore project, on which we have](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=3&mode=live&start=10.311) [Firebase enabled. This is the page where](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=3&mode=live&start=12.614) [we access Cloud Firestore. You can use](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=3&mode=live&start=15.396555555555555) [this drop-down here to switch over to the](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=3&mode=live&start=17.387750000000004) [Firebase Realtime Database. You can see](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=3&mode=live&start=20.555500000000002) [that the same set of tabs are available](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=3&mode=live&start=22.8364) [for the Realtime Database as well. Here,](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=3&mode=live&start=24.508857142857142)[as well, you can view all of the data that](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=3&mode=live&start=26.54222222222222) [is stored here. The Rules tab is what](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=3&mode=live&start=28.830400000000004) [you'll use to view and configure access to](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=3&mode=live&start=31.243888888888897) [your data from client applications. These](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=3&mode=live&start=33.69157142857143) [are your security rules. The data model](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=3&mode=live&start=36.358200000000004) [for the Realtime Database is different](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=3&mode=live&start=38.86914285714285) [from that of Firestore. That's why the](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=3&mode=live&start=40.672000000000004)[configuration of the security rules are](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=3&mode=live&start=42.687999999999995) [also different. Observe that the default](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=3&mode=live&start=44.8068) [set of rules basically locks down your](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=3&mode=live&start=46.885428571428584) [Realtime Database. You can't read, nor](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=3&mode=live&start=49.62833333333333) [write from client applications. Just as in](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=3&mode=live&start=52.26100000000001) [the case of Cloud Firestore, these rules](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=3&mode=live&start=54.64175000000001) [apply only to client apps, and not when](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=3&mode=live&start=56.442571428571426) [you use the web console directly. If you](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=3&mode=live&start=59.261) [need the data in your Realtime Database](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=3&mode=live&start=61.845749999999995) [backed up on a regular schedule, it's](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=3&mode=live&start=63.56471428571429) [possible to do that from the Backups tab.](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=3&mode=live&start=65.762)[And the Usage tab here will show you a](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=3&mode=live&start=68.618) [quick glimpse of how the various client](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=3&mode=live&start=70.21) [applications are accessing your Realtime](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=3&mode=live&start=72.393) [data. Let's switch back to the Data tab,](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=3&mode=live&start=75.66216666666669) [and see how we can add some data to the](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=3&mode=live&start=77.791) [Realtime Database using the web console.](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=3&mode=live&start=79.767) [Click on the plus button here in order to](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=3&mode=live&start=82.574) [add data. Remember that data in the](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=3&mode=live&start=84.902) [Realtime Database is stored in the form of](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=3&mode=live&start=88.169) [a JSON tree, so you simply go ahead and](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=3&mode=live&start=89.9754) [specify a key for your JSON object, and](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=3&mode=live&start=92.283) [use the plus button to specify the nested](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=3&mode=live&start=95.3485) [JSON structure. Under the users location,](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=3&mode=live&start=98.08833333333334) [we'll set up a number of users, starting](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=3&mode=live&start=100.40650000000001) [with user100, and the value will have](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=3&mode=live&start=103.24733333333336) [different JSON fields. The username is](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=3&mode=live&start=105.94499999999998) [Jane George for user100. If you want to](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=3&mode=live&start=108.663) [specify additional bits of data associated](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=3&mode=live&start=111.85842857142859) [with this user, click on the plus button](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=3&mode=live&start=113.712) [corresponding to the user100 node. Let's](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=3&mode=live&start=116.58728571428571) [specify an email address for this user as](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=3&mode=live&start=120.26242857142857) [well, janegeorge@ gmail.com. Let's specify](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=3&mode=live&start=123.2642) [a third field, that is the URL path to the](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=3&mode=live&start=126.0795) [profile picture for this user. Click on](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=3&mode=live&start=129.6832222222222) [the Add button, and that's all you need to](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=3&mode=live&start=132.08225) [do to set up the JSON structure for this](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=3&mode=live&start=133.92800000000005) [particular user. We have the users node at](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=3&mode=live&start=137.061) [the root level under our spikey-firestore](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=3&mode=live&start=139.61833333333325) [project, and within the users node we have](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=3&mode=live&start=142.53199999999998) [the user100 node. You can use the plus](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=3&mode=live&start=144.73899999999992) [button next to spikey-firestore to create](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=3&mode=live&start=147.281) [another root level JSON node. This node is](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=3&mode=live&start=149.672) [for posts made by various users. I'm going](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=3&mode=live&start=153.69700000000003) [to call this posts. Click on the plus](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=3&mode=live&start=156.33333333333331) [button next to posts to specify nested](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=3&mode=live&start=158.2495) [JSON structures within the top-level posts](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=3&mode=live&start=160.8825) [node. We have post01, and within that we](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=3&mode=live&start=164.05374999999998) [have multiple fields for a particular](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=3&mode=live&start=167.13500000000002) [post. The author of the post is Jane](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=3&mode=live&start=169.65550000000002)[George, and her userId is user100. This is](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=3&mode=live&start=171.980625) [the userId that we had created for her](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=3&mode=live&start=176.06825) [earlier. We have additional data available](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=3&mode=live&start=177.81099999999998) [for each post, which we add under the](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=3&mode=live&start=179.9474) [post01 node. This is the title of the](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=3&mode=live&start=182.78228571428576) [post, Introducing Spikey Diet, and the](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=3&mode=live&start=184.42000000000002) [starCount is 2. Now if you click on the](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=3&mode=live&start=187.03687500000004) [Add button, all of these details will be](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=3&mode=live&start=189.88950000000006) [added to your Realtime Database. Posts is](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=3&mode=live&start=191.8433333333333) [the path to the root-level JSON node,](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=3&mode=live&start=195.23250000000002) [under which there are multiple posts. If](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=3&mode=live&start=197.68099999999998) [you want to add additional keys within a](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=3&mode=live&start=199.99177777777777) [particular post, click on the plus button](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=3&mode=live&start=202.542) [next to that post. This will bring up the](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=3&mode=live&start=204.828) [UI, allowing you to specify additional](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=3&mode=live&start=207.341) [field value pairs for the JSON node. Click](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=3&mode=live&start=209.54) [on Add here, and the body key has been added to post01.](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=3&mode=live&start=212.83755555555555)

[Writing and Updating Data](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=4&mode=live)

[In this demo, we'll see how we can connect](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=4&mode=live&start=0.75) [to the Realtime Database from our client](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=4&mode=live&start=2.844) [applications, and perform write operations](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=4&mode=live&start=4.88) [on the database. Here I am at the terminal](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=4&mode=live&start=8.074) [window of my local machine. I'm going to](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=4&mode=live&start=10.721333333333332) [create a new folder here called](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=4&mode=live&start=12.528375000000002) [spikey\_realtime\_db. This is where I'm](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=4&mode=live&start=15.496500000000001) [going to store all of the code that I'm](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=4&mode=live&start=16.953555555555553) [going to write that will access and query](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=4&mode=live&start=18.85466666666666) [the Realtime Database. This is under the](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=4&mode=live&start=21.6015) [spikey-firestore folder that I had created](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=4&mode=live&start=24.74266666666666) [earlier. We'll first see how we can](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=4&mode=live&start=26.772199999999994) [perform CRUD operations or create, read,](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=4&mode=live&start=28.89175000000001) [update, and and delete operations, on the](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=4&mode=live&start=31.017999999999997) [Realtime Database. We'll write all of our](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=4&mode=live&start=34.05299999999999) [code in the realdb\_crud.js file. Open up](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=4&mode=live&start=35.80425) [this file using your favorite editor. In](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=4&mode=live&start=40.039) [my case I'm simply using nano, the](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=4&mode=live&start=42.26285714285714) [built-in editor I have on my Mac. As with](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=4&mode=live&start=44.737875) [Cloud Firestore, you first need to import](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=4&mode=live&start=47.35850000000001) [the libraries for the Firebase SDK, which](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=4&mode=live&start=49.959714285714284) [you do with a simple require statement.](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=4&mode=live&start=53.181125)[The node library to access the Realtime](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=4&mode=live&start=55.121) [Database is available in](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=4&mode=live&start=57.834) [firebase/database. Specify the same](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=4&mode=live&start=61.38120000000001) [configuration parameters that we've used](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=4&mode=live&start=63.821400000000004) [in earlier demos to initialize the](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=4&mode=live&start=65.82857142857141) [Firebase SDK, and call](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=4&mode=live&start=68.273) [firebase.initializeApp and pass in these](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=4&mode=live&start=70.87333333333333) [config parameters. I'm now going to define](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=4&mode=live&start=73.03833333333331) [a simple function to write some data to](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=4&mode=live&start=75.206125) [the users node of our JSON tree. The](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=4&mode=live&start=77.7272222222222) [writeUserData function takes in a userId,](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=4&mode=live&start=81.52433333333332) [name, email address, and an imageUrl for](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=4&mode=live&start=84.52600000000001) [the user. Every bit of data that we store](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=4&mode=live&start=87.34100000000002) [in the JSON tree in the Realtime Database](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=4&mode=live&start=89.94511111111109) [can be accessed by a unique path. We first](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=4&mode=live&start=92.29024999999999) [access the database by calling](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=4&mode=live&start=95.70542857142857) [Firebase.database, and then get a](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=4&mode=live&start=97.039) [reference to the path that you want to](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=4&mode=live&start=99.769) [modify by using the ref function. Observe](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=4&mode=live&start=101.528) [how the path is specified using forward](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=4&mode=live&start=104.11571428571429) [slashes. We want to access and modify the](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=4&mode=live&start=106.83885714285714) [data under the users node for a specific](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=4&mode=live&start=109.54244444444446) [userId. When you use the set function,](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=4&mode=live&start=112.509) [that will overwrite the data at that](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=4&mode=live&start=115.072) [specific location, at that node. It'll](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=4&mode=live&start=117.092) [overwrite any child nodes that previously](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=4&mode=live&start=119.95983333333334) [existed, so make sure that you use the set](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=4&mode=live&start=122.33633333333333) [function with care when working with the](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=4&mode=live&start=125.89700000000002) [Realtime Database. Here we update the](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=4&mode=live&start=128.2666) [fields for the username, email, and](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=4&mode=live&start=130.2192857142857) [profile picture. If the operation was](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=4&mode=live&start=132.7536) [successful, we can simply print out a](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=4&mode=live&start=135.1284) [success message, new user added with id](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=4&mode=live&start=137.29624999999993) [userId. Close the curly braces to complete](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=4&mode=live&start=140.66166666666663) [this function, and invoke this function.](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=4&mode=live&start=142.54385714285706) [Pass in a userId, username, email address,](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=4&mode=live&start=144.787) [and a URL path to a profile pic. I'll hit](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=4&mode=live&start=147.74) [Ctrl+X in order to save this file, and I'm](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=4&mode=live&start=150.78725000000003) [going to execute this code by calling node](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=4&mode=live&start=153.212) [realdb\_crud.js And if you've set things up](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=4&mode=live&start=158.01075000000003) [exactly as I have, you'll find that you'll](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=4&mode=live&start=160.5985)[encounter an error. That's because we](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=4&mode=live&start=162.9781428571428) [haven't set up our security rules to allow](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=4&mode=live&start=164.898) [client applications to write data. Switch](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=4&mode=live&start=167.59799999999993) [over to Rules on your Realtime Database](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=4&mode=live&start=169.91442857142857) [console, and let's change our rules so](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=4&mode=live&start=172.322) [that writes are allowed. Set write to](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=4&mode=live&start=175.09999999999997) [true. Deploy this rule to production by](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=4&mode=live&start=177.66787499999998) [clicking on Publish, and we can test this](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=4&mode=live&start=179.71659999999997) [rule out on the simulator. Click on](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=4&mode=live&start=181.88100000000006) [simulator, and you can see that this](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=4&mode=live&start=183.74175) [simulates a read operation on our Realtime](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=4&mode=live&start=185.64371428571428)[Database. Click Run, and read was denied.](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=4&mode=live&start=188.64600000000002) [Well, that's because our security rule](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=4&mode=live&start=191.723) [says that no one can read data. Let's go](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=4&mode=live&start=194.144) [back and hit Set. That is the simulation](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=4&mode=live&start=198.05499999999998) [type. And when you hit run this time,](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=4&mode=live&start=200.66299999999998) [you'll find that the simulated set was](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=4&mode=live&start=202.361) [allowed. Now that we've enabled writes on](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=4&mode=live&start=205.3937499999999) [our Realtime Database, let's switch back](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=4&mode=live&start=207.12471428571422) [to our realdb\_crud.js file and execute it.](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=4&mode=live&start=209.0367142857143) [And a new user has been added with ID](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=4&mode=live&start=213.226) [user101. If you switch over to the Data](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=4&mode=live&start=215.515)[tab, you'll find that a brand-new user has](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=4&mode=live&start=218.46) [been added. This is user 101. If you want](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=4&mode=live&start=221.31300000000002) [to view this JSON tree in an expanded](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=4&mode=live&start=224.82870000000003) [format, you want to expand all nodes, you](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=4&mode=live&start=226.965) [can click on this plus button to the top](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=4&mode=live&start=229.24150000000003) [right. I click on plus, and here is](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=4&mode=live&start=231.63774999999998) [user01, exactly with the data that we had](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=4&mode=live&start=233.98512500000004) [specified from our client app. Let's go](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=4&mode=live&start=236.68375000000003) [back and perform some more operations on](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=4&mode=live&start=238.84514285714286) [our realdb\_crud.js file. I'm going to](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=4&mode=live&start=241.8484) [comment out the writeUserData function](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=4&mode=live&start=244.8412857142857) [invocation here, and write a new function](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=4&mode=live&start=246.27157142857143) [definition for writeNewPost. This will](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=4&mode=live&start=248.95725) [write some data out to the post JSON node.](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=4&mode=live&start=251.785) [It takes in a uid, a username, and a title](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=4&mode=live&start=254.73287499999995) [for the post. Specify the post information](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=4&mode=live&start=258.38349999999997) [that you want to write out in a JSON](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=4&mode=live&start=260.499) [format, the realdb is a JSON tree after](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=4&mode=live&start=263.2651250000001)[all, and this time instead of specifying](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=4&mode=live&start=266.05687499999993) [our own ID for this post, we'll have the](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=4&mode=live&start=268.121) [Realtime Database generate a new ID for us](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=4&mode=live&start=271.254) [using the push function. We call](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=4&mode=live&start=274.273) [firebase.database to access the Realtime](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=4&mode=live&start=277.3786666666667) [DB, reference the child of the post node,](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=4&mode=live&start=279.87583333333333) [and the push function here generates a new](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=4&mode=live&start=284.07950000000005) [key under the posts location. We access](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=4&mode=live&start=288.22362499999997) [this key and assign it to the new post key](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=4&mode=live&start=291.2764444444444) [variable. Now that we have a key, we have](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=4&mode=live&start=294.13475) [the complete path to the location that we](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=4&mode=live&start=296.6101111111112) [want to update, so we want to update](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=4&mode=live&start=299.471) [posts, and under that the newPostKey.](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=4&mode=live&start=301.34) [Assign the postData that we had set up](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=4&mode=live&start=304.181) [earlier to this path. Get a reference to](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=4&mode=live&start=306.472) [the Realtime Database and update this](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=4&mode=live&start=310.01214285714286) [particular location path. The update](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=4&mode=live&start=312.60550000000006) [function will write to specific children](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=4&mode=live&start=315.0268571428572) [of a node without overwriting other](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=4&mode=live&start=317.37216666666666) [children, so use the update function when](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=4&mode=live&start=319.674) [you want to update data without](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=4&mode=live&start=322.72) [overwriting all of the child nodes. If the](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=4&mode=live&start=325.3)[update is successful, we'll print out a](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=4&mode=live&start=327.6276) [success message to the console. Let's call](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=4&mode=live&start=330.0813333333333) [writeNewPost, that's our function](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=4&mode=live&start=332.65239999999994) [invocation. This is a post by Sarah](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=4&mode=live&start=334.47749999999996) [Rickman, user101. Hit Ctrl+X to save](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=4&mode=live&start=338.49875) [changes to this file, and run node on this](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=4&mode=live&start=340.7765) [updated file, and you can see that a new](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=4&mode=live&start=344.1407142857143) [post has been added with an auto-generated](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=4&mode=live&start=346.0344000000002) [id. This is the id that was generated by](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=4&mode=live&start=348.6753999999999) [the push function. And if you head over to](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=4&mode=live&start=351.445) [the web console for the Realtime Database,](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=4&mode=live&start=353.3903333333334) [you'll find the new post there under the posts JSON node.](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=4&mode=live&start=355.0587142857143)

[Read Update and Delete Data](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=5&mode=live)

[In this demo, we'll continue with CRUD](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=5&mode=live&start=0.75) [operations on the Realtime Database and](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=5&mode=live&start=2.901) [see how we can perform read, update, and](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=5&mode=live&start=4.470428571428572) [delete operations. We'll continue to write](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=5&mode=live&start=7.668333333333333) [our code in the realdb\_crud.js file.](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=5&mode=live&start=9.978499999999999) [Comment out the previous writeNewPost](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=5&mode=live&start=14.541) [function invocation, and let's write some](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=5&mode=live&start=16.991) [new function definitions. First we get a](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=5&mode=live&start=18.976) [reference to the Realtime Database by](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=5&mode=live&start=21.906) [calling firebase.database and store it in](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=5&mode=live&start=23.807599999999997) [the db variable. Here is a function within](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=5&mode=live&start=26.398999999999997) [which we'll read all posts written by all](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=5&mode=live&start=28.763625) [users. We get a reference to all posts by](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=5&mode=live&start=32.197) [simply calling db.ref and specifying the](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=5&mode=live&start=34.56955555555554) [posts node. Posts is a root-level node,](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=5&mode=live&start=38.02600000000002) [and can be accessed using the location](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=5&mode=live&start=40.51912500000001) [path, /posts. When you read data from the](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=5&mode=live&start=43.76299999999999) [Realtime Database, you listen for updates.](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=5&mode=live&start=46.35685714285714) [You can listen exactly once, or listen on](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=5&mode=live&start=48.843) [a continuous basis. The on method is what](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=5&mode=live&start=51.443000000000026) [you'll use to read data at a particular](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=5&mode=live&start=55.226555555555564) [path, and listen for changes on that path.](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=5&mode=live&start=57.89200000000001) [The value string here is the name of the](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=5&mode=live&start=61.135) [event that you're listening on. This is](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=5&mode=live&start=63.702) [the event that you would listen to in](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=5&mode=live&start=66.14374999999998) [order to read the contents of the entire](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=5&mode=live&start=67.56722222222223) [path, which in this case is the posts JSON](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=5&mode=live&start=69.833875) [node. When you use the on method to listen](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=5&mode=live&start=74.13933333333333) [on the value event, the event first](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=5&mode=live&start=77.03033333333329) [triggers a static snapshot of the contents](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=5&mode=live&start=79.42085714285714) [as they existed at the time of the event,](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=5&mode=live&start=82.21985714285715) [and this snapshot is called each time the](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=5&mode=live&start=85.163) [contents change in the Realtime Database.](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=5&mode=live&start=88.17642857142857) [The callback that you specify will be](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=5&mode=live&start=90.999) [triggered once with the current content,](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=5&mode=live&start=92.604) [and will be triggered once again each time](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=5&mode=live&start=95.079) [the contents change. For the snapshot that](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=5&mode=live&start=97.53825) [you receive, you can simply invoke the val](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=5&mode=live&start=100.08633333333331) [function to access all of the underlying](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=5&mode=live&start=102.4022857142857) [data. This function will return a null](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=5&mode=live&start=104.8408571428571) [value when no data exists at that node.](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=5&mode=live&start=107.30157142857139) [The on method is what we use to listen for](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=5&mode=live&start=110.037) [realtime updates. In this particular](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=5&mode=live&start=112.48)[example, we'll simply use this to read](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=5&mode=live&start=114.322) [data once. So call the readAllPosts](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=5&mode=live&start=116.872) [function, save this file, switch over to](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=5&mode=live&start=120.047) [your terminal window, and execute the](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=5&mode=live&start=122.084) [crud.js file. And you should get a](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=5&mode=live&start=124.874) [permission denied here. That's because, if](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=5&mode=live&start=127.751) [you remember, our security rule](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=5&mode=live&start=129.405) [specification, we had allowed writes to](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=5&mode=live&start=131.877) [our database, but we hadn't allowed reads](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=5&mode=live&start=133.98442857142857) [yet. Read is set to false, which means](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=5&mode=live&start=136.43116666666668) [read actions are not permitted. Change](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=5&mode=live&start=138.426) [this so that client applications are](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=5&mode=live&start=140.6792857142857) [allowed to read from the Realtime](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=5&mode=live&start=142.943) [Database, and hit Publish to deploy these](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=5&mode=live&start=144.84585714285723) [new security rules. Let's test this out](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=5&mode=live&start=147.21242857142857) [using the simulator button on the top](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=5&mode=live&start=149.98914285714287) [right. Switch over the operation to be](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=5&mode=live&start=152.7101428571428) [read on our current database. Hit Run, and](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=5&mode=live&start=155.308) [you'll find that this executes](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=5&mode=live&start=158.23087499999997)[successfully, simulated read is allowed.](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=5&mode=live&start=160.204) [So when we go back to our terminal window](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=5&mode=live&start=162.851) [and execute our realdb\_crud.js file, this](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=5&mode=live&start=164.595) [should now read the data under the posts](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=5&mode=live&start=168.04537499999998) [node. There are two posts currently in our](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=5&mode=live&start=170.56671428571428) [database, one by Sarah Rickman and another](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=5&mode=live&start=173.48075) [by Jane George. And you can see that this](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=5&mode=live&start=175.50424999999998) [read operation waits for updates from the](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=5&mode=live&start=178.81250000000006) [Realtime Database. Hit Ctrl+C, and let's](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=5&mode=live&start=181.29500000000002) [switch back to editing our realdb\_crud.js.](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=5&mode=live&start=183.5835714285714) [We'll see how realtime updates work in](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=5&mode=live&start=187.823) [just a little bit. For now, we're just](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=5&mode=live&start=189.463) [reading data. Comment out the readAllPosts](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=5&mode=live&start=191.80833333333334) [function implication, and let's write a](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=5&mode=live&start=193.97819999999996) [new function to execute a transaction on](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=5&mode=live&start=195.92783333333335) [the Realtime Database. This is going to be](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=5&mode=live&start=198.2744285714285) [a very simple transaction which updates](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=5&mode=live&start=200.82249999999993) [the starCount associated with each post.](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=5&mode=live&start=203.10383333333337) [The input argument of this function is a](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=5&mode=live&start=206.555) [reference to the post that needs to be](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=5&mode=live&start=208.557) [updated, and we call postRef.transaction](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=5&mode=live&start=210.684) [to kickstart our transaction. The Realtime](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=5&mode=live&start=214.073) [Database has support for transactions to](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=5&mode=live&start=216.46699999999998) [execute reads and writes as atomic units,](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=5&mode=live&start=218.58333333333331) [however, transactions are not retried](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=5&mode=live&start=222.22349999999997) [until they are successful, as in the case](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=5&mode=live&start=224.47066666666663) [of Cloud Firestore. In this particular](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=5&mode=live&start=227.3263333333334) [transaction, we access the current](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=5&mode=live&start=229.56399999999996) [StarCount for this post, and increment it](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=5&mode=live&start=231.41571428571433) [by 1. So we perform a read and an](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=5&mode=live&start=233.77299999999997) [increment operation, and we simply print](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=5&mode=live&start=236.27612499999998) [the updated StarCount to screen. Use the](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=5&mode=live&start=238.64157142857147)[firebase.database to access a particular](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=5&mode=live&start=241.8395) [post by path. Posts/post01 is the post](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=5&mode=live&start=243.76999999999998) [that we are referencing here and update](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=5&mode=live&start=246.885) [its starCount. Save this file, and let's](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=5&mode=live&start=250.21833333333336) [execute this operation using node on the](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=5&mode=live&start=252.1928571428571) [command line. And you can see that the](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=5&mode=live&start=254.54585714285716) [post has been updated with a new starCount](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=5&mode=live&start=256.47499999999997) [of 3, and you can confirm this using the](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=5&mode=live&start=259.04000000000013) [Firebase Realtime Database web console.](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=5&mode=live&start=261.967) [Here is post01 by the author, Jane George,](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=5&mode=live&start=264.693) [and the starCount value is now 3. Let's](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=5&mode=live&start=268.064) [head back to our terminal window and](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=5&mode=live&start=270.913) [continue editing realdb\_crud.js. I've](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=5&mode=live&start=273.62649999999996) [commented out the previous function](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=5&mode=live&start=276.929) [invocation. I have now written a function](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=5&mode=live&start=278.029) [to delete a specific post at a path. This](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=5&mode=live&start=280.211) [function takes in a postId as an input](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=5&mode=live&start=283.547625) [argument, and we get a reference to that](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=5&mode=live&start=286.28524999999996) [post by calling the firebase.database and](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=5&mode=live&start=289.0296666666667) [referencing that post by id. And once we](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=5&mode=live&start=291.56083333333333) [have a reference to this post, all we need](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=5&mode=live&start=294.4036666666666) [to do is to call remove on this post. With](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=5&mode=live&start=296.5605) [that function definition complete, let's](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=5&mode=live&start=299.507) [invoke this function on post01. So I want](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=5&mode=live&start=301.6331666666666) [to delete the post with id 01. Save this](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=5&mode=live&start=305.4575) [file, run this code on the terminal](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=5&mode=live&start=308.4955) [window, and you can see that the post with](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=5&mode=live&start=309.75125) [id post01 was removed. And this can be](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=5&mode=live&start=312.111) [easily confirmed by taking a look at our](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=5&mode=live&start=314.8494999999999)[Realtime Database. Observe here that under](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=5&mode=live&start=317.4966666666667) [the posts node we have just one post. The](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=5&mode=live&start=319.5799999999999) [other post with id post01 has been deleted.](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=5&mode=live&start=323.612)

[Retrieving Ordered Data](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=6&mode=live)

[In this demo, we'll see how we can execute](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=6&mode=live&start=0.75) [queries on the datastore in the Realtime](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=6&mode=live&start=3.056) [Database, and also see how we can wire up](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=6&mode=live&start=5.477) [change listeners to listen to realtime](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=6&mode=live&start=8.276125) [updates. We'll write the code for this](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=6&mode=live&start=11.120875000000005) [demo in a new file called](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=6&mode=live&start=12.754199999999996) [realdb\_queries.js. Open this up using your](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=6&mode=live&start=16.175666666666665) [favorite editor. In my case, it happens to](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=6&mode=live&start=18.73785714285715) [be nano. Set up the require statements to](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=6&mode=live&start=20.823750000000008) [import the Firebase SDK, as well as the](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=6&mode=live&start=23.522571428571432) [library for the Realtime Database. Also,](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=6&mode=live&start=25.718000000000004)[initialize your Firebase SDK using the](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=6&mode=live&start=28.046166666666668) [config parameters that we get from our](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=6&mode=live&start=30.587714285714284) [Firebase web console. Observe that you](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=6&mode=live&start=32.73) [access the Realtime Database using](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=6&mode=live&start=35.13550000000001) [firebase.database. I'll now define a](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=6&mode=live&start=39.004999999999995) [function to run a query on UserData for a](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=6&mode=live&start=41.298222222222215) [particular userId that's passed in as an](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=6&mode=live&start=44.17957142857143) [input argument to this function. Now, it's](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=6&mode=live&start=46.92188888888889) [often the case that data stored in your](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=6&mode=live&start=49.293000000000006) [Realtime Database does not change, which](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=6&mode=live&start=51.79014285714286) [means you want to read it exactly once,](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=6&mode=live&start=53.564625) [you don't want to hook up a listener to](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=6&mode=live&start=55.03722222222222) [this data. In such situations, you will](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=6&mode=live&start=57.07483333333333) [access the data at that particular path](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=6&mode=live&start=59.8715) [using the once method. This is what you'll](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=6&mode=live&start=62.318) [use to read data exactly once. You want a](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=6&mode=live&start=64.87650000000002) [snapshot of the current contents of that](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=6&mode=live&start=67.11149999999998) [JSON node. You don't want to wire up a](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=6&mode=live&start=70.09300000000002) [change listener. Once we have a snapshot](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=6&mode=live&start=73.15833333333332) [of the data for this particular user,](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=6&mode=live&start=74.68800000000003) [we'll use the val function as before in](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=6&mode=live&start=76.35514285714284) [order to access the contents of this node.](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=6&mode=live&start=78.76299999999998) [Here I am accessing the username for this](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=6&mode=live&start=81.778) [particular user, and printing that out to](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=6&mode=live&start=84.068) [screen using a console.log function. Let's](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=6&mode=live&start=86.685)[invoke this function for a particular](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=6&mode=live&start=89.83628571428571) [user, one with userId user100. Save this](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=6&mode=live&start=91.032) [file, and execute this code, and you'll](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=6&mode=live&start=95.45885714285714) [find that the username is Jane George, and](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=6&mode=live&start=97.7105) [this is easily confirmed by switching over](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=6&mode=live&start=100.79114285714286) [to take a look at this particular user on](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=6&mode=live&start=102.94500000000001) [the Firebase web console. We'll go back to](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=6&mode=live&start=105.74142857142859) [editing our realdb\_queries.js file. This](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=6&mode=live&start=108.804) [time we'll write a function called](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=6&mode=live&start=112.40228571428571) [orderByKey. This is how we retrieve](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=6&mode=live&start=113.958) [results from the Realtime Database in an](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=6&mode=live&start=116.742)[ordered format. Here we want to access](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=6&mode=live&start=118.736) [post information, and we want to retrieve](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=6&mode=live&start=121.827) [this information ordered by key.](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=6&mode=live&start=124.466) [OrderByKey will retrieve all of the post](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=6&mode=live&start=127.312) [information in the order of the key of the](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=6&mode=live&start=129.873) [child nodes. We've used the on method here](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=6&mode=live&start=133.189) [to retrieve data. This listens for](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=6&mode=live&start=136.8485) [additions to the lists of posts, so each](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=6&mode=live&start=139.2585714285714) [time a child is added, the results will be](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=6&mode=live&start=141.55088888888895) [returned ordered by key. Here, once again,](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=6&mode=live&start=144.55200000000002) [we'll focus on the order in which the](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=6&mode=live&start=147.21962500000004)[posts are returned. We won't focus on the](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=6&mode=live&start=149.72549999999995) [Realtime aspects of the updates. For each](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=6&mode=live&start=152.11914285714283) [child node retrieved, we'll simply print](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=6&mode=live&start=155.06671428571426) [out the key to the console. Invoke the](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=6&mode=live&start=156.97385714285713) [orderByKey function, save this file, and](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=6&mode=live&start=160.34216666666666) [let's run this code. And you'll find that](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=6&mode=live&start=162.28271428571423) [we have exactly one post here, and that's](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=6&mode=live&start=164.83075)[returned in the lexicographical order. I](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=6&mode=live&start=167.654) [leave this as an exercise for you to try](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=6&mode=live&start=170.34269999999998) [this out with multiple posts with](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=6&mode=live&start=172.689) [different keys. Just create a new post](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=6&mode=live&start=174.948) [here with a new id, and the results should](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=6&mode=live&start=177.925) [be returned ordered by key. Instead, we'll](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=6&mode=live&start=180.4) [take a look at a more useful example of](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=6&mode=live&start=184.11166666666668) [ordering in the function orderByChild.](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=6&mode=live&start=187.30833333333334) [Keys for individual posts might be](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=6&mode=live&start=189.5096) [auto-generated, which means ordering by](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=6&mode=live&start=192.72400000000002) [key is not really a meaningful way to](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=6&mode=live&start=194.18155555555555) [order your data. Sometimes you might want](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=6&mode=live&start=196.68800000000005) [to order your data based on a particular](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=6&mode=live&start=199.09850000000003) [field value within your JSON node, and](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=6&mode=live&start=201.7142857142857) [that's what the orderByChild function](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=6&mode=live&start=204.29485714285715) [helps us do. Get a reference to the users](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=6&mode=live&start=206.65679999999998) [node in your Realtime Database, and let's](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=6&mode=live&start=209.99266666666674) [access all of our users ordered by email](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=6&mode=live&start=212.58466666666666)[address. Invoke the orderByChild function,](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=6&mode=live&start=216.9594285714285) [and specify that the email address is the](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=6&mode=live&start=219.779) [field on which you want to order your](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=6&mode=live&start=222.255) [data. And within your callback, print out](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=6&mode=live&start=224.7261111111112) [the username of the child that you've just](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=6&mode=live&start=227.02957142857147) [retrieved. These are the users. Invoke](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=6&mode=live&start=230.61962499999996) [orderByChild, and let's execute this bit](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=6&mode=live&start=232.82716666666667) [of code. And here are the two users in our](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=6&mode=live&start=235.044) [Realtime Database ordered on the basis of](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=6&mode=live&start=238.18314285714285) [their email address. This is in the](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=6&mode=live&start=240.927) [lexicographical order. Sarah Rickman comes](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=6&mode=live&start=243.99799999999993) [first because S in her email address is](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=6&mode=live&start=245.77650000000003) [capitalized, whereas Jane George has a small g.](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=6&mode=live&start=248.689)

[Wiring up Realtime Change Listeners](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=7&mode=live)

[And in the final demo for this module,](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=7&mode=live&start=0.844) [let's see how the most significant aspect](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=7&mode=live&start=2.965) [of the Realtime Database works, how we can](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=7&mode=live&start=5.604) [listen for Realtime updates. We'll](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=7&mode=live&start=8.220428571428572) [continue writing code in the](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=7&mode=live&start=10.016833333333334) [realdb\_queries.js file. Comment out all](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=7&mode=live&start=11.676) [other method invocations. We'll set up a](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=7&mode=live&start=15.4165) [new function called setChangeListener.](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=7&mode=live&start=17.873857142857137) [Here we'll specify a number of different](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=7&mode=live&start=20.674) [kinds of change listeners to listen for](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=7&mode=live&start=22.566) [updates on our data. We'll listen for](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=7&mode=live&start=24.872) [updates on the posts that are available in](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=7&mode=live&start=28.329125000000005) [our Realtime Database. Get a reference to](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=7&mode=live&start=30.632) [the posts node by calling db.ref posts.](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=7&mode=live&start=32.8175) [The very first listener that we'll add](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=7&mode=live&start=35.83)[here will check to see whether a child](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=7&mode=live&start=37.90725000000002) [node for this particular node has changed.](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=7&mode=live&start=40.21144444444445) [This is the child\_changed event that we](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=7&mode=live&start=43.053) [are listening on. Observe that we use the](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=7&mode=live&start=45.60525) [on function to continuously listen for](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=7&mode=live&start=48.218624999999996) [realtime updates, not just once. Anytime](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=7&mode=live&start=50.971799999999995) [an update is made to a post within the](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=7&mode=live&start=53.696555555555555) [post node, we get the value of this](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=7&mode=live&start=56.47777777777778) [changed post by calling the val function,](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=7&mode=live&start=58.916) [and print out the title to screen. Let's](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=7&mode=live&start=61.429) [set up this single ChangeListener. Invoke](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=7&mode=live&start=64.95333333333333)[this function, save this file, and let's](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=7&mode=live&start=67.12383333333332) [execute this code and see how this](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=7&mode=live&start=69.49) [ChangeListener works. When you run this](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=7&mode=live&start=71.592) [code, your web application will be waiting](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=7&mode=live&start=73.80160000000002) [and listening on changes to the posts](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=7&mode=live&start=76.187) [data. Let's not have our change listener](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=7&mode=live&start=79.49975000000003) [listen in vain. Switch over to the web](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=7&mode=live&start=81.4584285714286) [console, and let's make an update to this](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=7&mode=live&start=83.38599999999997) [particular post. The food here is](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=7&mode=live&start=86.45166666666667) [capitalized. I'm going to switch this over](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=7&mode=live&start=88.6254) [to be lowercase. Hit Enter to save this](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=7&mode=live&start=91.04100000000004) [update to this post, and go back to your](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=7&mode=live&start=93.50022222222223) [terminal window. And here you can see that](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=7&mode=live&start=96.29585714285712) [our listener has successfully received](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=7&mode=live&start=98.58366666666669) [this change event, the updated post title](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=7&mode=live&start=100.40759999999999) [has f in lowercase. We'll now go back to](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=7&mode=live&start=103.70300000000002) [editing our realdb\_queries.js file, and](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=7&mode=live&start=106.99457142857143) [add another change listener. This time](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=7&mode=live&start=109.08799999999998) [we'll listen for new posts that have been](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=7&mode=live&start=111.83866666666667) [added. The on function here on our post](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=7&mode=live&start=114.6362857142857) [reference is listening on child\_added. The](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=7&mode=live&start=117.16537499999998) [callback for this particular listener](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=7&mode=live&start=121.12483333333334)[receives an additional bit of information,](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=7&mode=live&start=122.979) [the key of the previous post in the list](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=7&mode=live&start=125.567) [in the database. Within the callback,](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=7&mode=live&start=128.625) [we'll access the information for this](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=7&mode=live&start=131.743) [newly added post and print out the author,](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=7&mode=live&start=133.448) [title, and the prevChildKey, that is the](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=7&mode=live&start=136.893) [key of the previous post in the list.](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=7&mode=live&start=140.427) [We've written all of this code within the](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=7&mode=live&start=142.79) [setChangeListener function, which we have](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=7&mode=live&start=144.08) [invoked. Go back and execute the](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=7&mode=live&start=146.7125) [realdb\_queries.js, and we are now](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=7&mode=live&start=150.06900000000002) [listening for new posts. 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Here is some chat](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=8&mode=live&start=65.04716666666667) [information. You can imagine that this](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=8&mode=live&start=69.01799999999997) [represents data stored in a Realtime](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=8&mode=live&start=71.29371428571427) [Database which is chat information for a](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=8&mode=live&start=73.56150000000002) [particular forum. We have a top-level](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=8&mode=live&start=76.74600000000001) [chats node, under which we have multiple](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=8&mode=live&start=79.58199999999998)[chat topics represented by chat01, chat02,](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=8&mode=live&start=81.91628571428572) [and so on. This structure that we have set](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=8&mode=live&start=84.56399999999998) [up has nested data. All messages that](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=8&mode=live&start=87.67424999999997) [belong to a particular chat are nested](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=8&mode=live&start=89.95837499999999) [within each chat's JSON node. Messages m1,](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=8&mode=live&start=93.09899999999999) [m2, and so on, are part of chat01 with the](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=8&mode=live&start=97.4691666666667) [title Best places to visit in Bangalore.](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=8&mode=live&start=100.653) [Now let's say you perform a query on this](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=8&mode=live&start=103.781) [forum that requires that you retrieve the](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=8&mode=live&start=105.377) [titles of all chats that are present](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=8&mode=live&start=107.284) [within this forum, so you want only the](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=8&mode=live&start=110.735) [titles, you're not interested in the](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=8&mode=live&start=112.827) [messages. But because you've nested your](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=8&mode=live&start=114.98014285714288) [message data within the chat node, all of](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=8&mode=live&start=117.0797142857143) [the messages will be retrieved as well.](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=8&mode=live&start=119.55499999999996) [We're only interested in the titles of all](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=8&mode=live&start=122.462) [chats, however, all of the nested messages](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=8&mode=live&start=124.544) [will be retrieved, which is a huge](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=8&mode=live&start=126.953) [performance hit, so make sure that when](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=8&mode=live&start=128.995) [you structure your data in the Realtime](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=8&mode=live&start=130.76) [Database you avoid nesting data where](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=8&mode=live&start=133.066) [possible. And how do you do this? You do](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=8&mode=live&start=136.1851428571429) [this by flattening your data structures.](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=8&mode=live&start=138.67625) [Let's set up the same chats forum as](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=8&mode=live&start=140.528) [before, but this time we'll flatten it.](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=8&mode=live&start=143.335) [Here is the chats node, under which we](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=8&mode=live&start=145.541) [have individual chats, chat01, 02, and so](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=8&mode=live&start=147.79255555555557) [on, but this only has the chat metadata](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=8&mode=live&start=151.51542857142857) [information. All of the chat metadata is](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=8&mode=live&start=154.96337500000007) [fairly lightweight, and we can store all](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=8&mode=live&start=157.06428571428572) [of these at one location. Observe that the](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=8&mode=live&start=158.82799999999992) [messages are not part of this JSON](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=8&mode=live&start=162.06212500000004) [structure. Instead, create a different](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=8&mode=live&start=164.264)[JSON node, or a different path which](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=8&mode=live&start=166.81633333333335) [stores messages for individual chats.](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=8&mode=live&start=169.52214285714288) [Observe that we've moved the messages data](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=8&mode=live&start=172.065) [into a separate JSON node called messages.](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=8&mode=live&start=174.965) [All of these messages are still indexed by](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=8&mode=live&start=178.538) [chat ID. Indexing messages using chat ID](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=8&mode=live&start=181.257) [establishes the relationship between chats](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=8&mode=live&start=184.575) [and messages. Messages are wrapped into](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=8&mode=live&start=186.997) [chats. Chats are made up of messages. Now,](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=8&mode=live&start=190.88080000000005) [retrieving chat metadata information need](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=8&mode=live&start=193.7588) [not retrieve messages, retrieving messages](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=8&mode=live&start=196.0745) [does not need chat metadata information,](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=8&mode=live&start=197.986) [we thus denormalized our data, flattened](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=8&mode=live&start=200.91599999999997) [our nested structures to improve](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=8&mode=live&start=203.9615) [performance. But how do we structure more](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=8&mode=live&start=206.13733333333332) [complex two-way relationships? Let's take](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=8&mode=live&start=208.87242857142851) [a look at that in Creating data that](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=8&mode=live&start=211.01700000000002) [scales. If you have a two-way](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=8&mode=live&start=213.8245) [relationship, that is more complex than a](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=8&mode=live&start=216.24783333333332) [one-way relationship, where messages make](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=8&mode=live&start=218.6575714285715) [up a chat. Two-way relationships in the](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=8&mode=live&start=220.91799999999995)[Realtime Database are modeled using an](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=8&mode=live&start=223.68860000000004) [index of groups. Let's understand what](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=8&mode=live&start=226.04824999999997) [that means. Let's take a typical example](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=8&mode=live&start=228.38779999999997) [of a two-way relationship, users and](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=8&mode=live&start=230.45637499999992) [groups. Users belong to groups, and groups](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=8&mode=live&start=233.45075) [are made up of users, so you have to have](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=8&mode=live&start=236.60675000000003) [a way to go from a group to all of the](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=8&mode=live&start=239.96963636363625) [users in a group, and you have to know](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=8&mode=live&start=242.1672727272727) [which groups a particular user belongs to.](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=8&mode=live&start=244.71325000000007) [With the Realtime Database, we'll use an](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=8&mode=live&start=247.786) [index of groups to map this two-way](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=8&mode=live&start=250.065) [relationship. Here is an example of the](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=8&mode=live&start=253.506375) [JSON structure that might be used to](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=8&mode=live&start=255.78450000000004) [represent user information. We have a](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=8&mode=live&start=258.05125) [users node at the very top, that is the](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=8&mode=live&start=259.91033333333337) [root node, and within that we have user01,](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=8&mode=live&start=262.2806666666667) [02, 03, and so on. Observe that for each](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=8&mode=live&start=264.67342857142853) [user we need to specify the groups that](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=8&mode=live&start=268.4065000000001) [the user belongs to, so for every user we](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=8&mode=live&start=270.9340000000001) [use this groups index to map which groups](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=8&mode=live&start=273.9353333333333) [the user belongs to. This particular user](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=8&mode=live&start=276.7796666666667) [belongs to the hikers group and the](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=8&mode=live&start=279.1915714285715) [photographers group. For this index that](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=8&mode=live&start=281.85619999999994) [we've set up, the values associated with](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=8&mode=live&start=283.8398571428571) [this key, hikers and photographers, does](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=8&mode=live&start=286.47233333333327)[not matter, only that the key exists](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=8&mode=live&start=288.8806666666667) [within the outer user node. This sets up](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=8&mode=live&start=291.4983749999999) [one direction of the relationship. For a](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=8&mode=live&start=294.6039999999999) [particular user, we know all of the groups](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=8&mode=live&start=297.2103333333332) [that he or she belongs to. Let's set up](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=8&mode=live&start=299.26799999999986) [the other direction as well. We have a](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=8&mode=live&start=301.71314285714277) [root node containing groups information.](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=8&mode=live&start=304.1379999999999) [Here is the JSON structure for groups](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=8&mode=live&start=307.697) [information. Groups is the root node, and](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=8&mode=live&start=309.3) [within the groups node we have nested](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=8&mode=live&start=311.416625) [nodes for individual groups, hikers,](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=8&mode=live&start=313.206)[photographers, artists, and so on, so](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=8&mode=live&start=315.4385) [there is a separate path to store group](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=8&mode=live&start=318.4774444444445) [information. Observe that nested within](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=8&mode=live&start=320.649) [every group there is an index that also](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=8&mode=live&start=323.38) [tracks user membership of that group, so](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=8&mode=live&start=326.208) [within the hikers group we have a members](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=8&mode=live&start=329.10787500000004) [node which specifies which users are](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=8&mode=live&start=331.68416666666667) [members of the hikers group. Flatten your](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=8&mode=live&start=334.77933333333334) [data structures, and use an index of](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=8&mode=live&start=337.40700000000004) [groups to map two-way relationships. You](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=8&mode=live&start=340.0301428571429) [have to remember something here, though,](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=8&mode=live&start=342.801) [if you update a particular group, let's](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=8&mode=live&start=344.73314285714287) [say you add a new user, these updates have](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=8&mode=live&start=347.2475714285714) [to reflect in the groups node, as well as](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=8&mode=live&start=349.89099999999996) [in the user node. In order to structure](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=8&mode=live&start=352.38399999999996) [your data so that it scales, you have to](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=8&mode=live&start=354.5425555555555) [perform multiple updates to the Realtime Database.](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=8&mode=live&start=357.37433333333337)

[Summary and Further Study](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=9&mode=live)

[And with this quick note on best practices](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=9&mode=live&start=0.75) [to structure data, we come to the very end](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=9&mode=live&start=2.834) [of this module on the Firebase Realtime](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=9&mode=live&start=5.451) [Database. The Realtime Database is the](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=9&mode=live&start=7.940374999999999) [original storage solution on Firebase. You](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=9&mode=live&start=10.1285) [can hook up Realtime listeners and get](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=9&mode=live&start=12.653142857142857) [Realtime updates across all of your client](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=9&mode=live&start=15.257857142857143) [apps. The Realtime Database is a mature](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=9&mode=live&start=17.48742857142857) [and robust product that has been around](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=9&mode=live&start=20.146285714285714) [for several years. It offers low latency](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=9&mode=live&start=22.313499999999998) [and high performance for your data, and is](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=9&mode=live&start=25.395142857142854) [currently in general availability and very](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=9&mode=live&start=28.504124999999995) [suitable for your production apps, unlike](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=9&mode=live&start=30.7225) [Firestore that is currently available only](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=9&mode=live&start=33.35975) [in the beta release. The Realtime Database](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=9&mode=live&start=35.272142857142875) [structures data in the form of a JSON](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=9&mode=live&start=38.371) [tree, which means it's very suitable for](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=9&mode=live&start=40.676777777777794) [simple kinds of data. If you want data](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=9&mode=live&start=43.22271428571429) [that has hierarchal relationships, Cloud](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=9&mode=live&start=45.944) [Firestore is far better. So use the](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=9&mode=live&start=48.5612) [Realtime Database if you have simple data](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=9&mode=live&start=51.03049999999999) [and you cannot use a product in beta](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=9&mode=live&start=52.739000000000004) [release, otherwise use Firestore. And on](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=9&mode=live&start=55.53366666666667) [this node, we come to the very end of this](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=9&mode=live&start=58.385999999999996) [course where we discussed two kinds of](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=9&mode=live&start=60.492) [realtime databases available on the](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=9&mode=live&start=62.522666666666666) [Firebase mobile and app development](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=9&mode=live&start=64.426) [platform, Cloud Firestore and the Realtime](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=9&mode=live&start=66.877) [Database. But before you head out, make](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=9&mode=live&start=70.3672857142857) [sure you clean up all of the resources](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=9&mode=live&start=72.35750000000003) [that you've provisioned for this](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=9&mode=live&start=74.309) [particular course. Clean up all of the](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=9&mode=live&start=76.0024) [data that you've stored in Cloud Firestore](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=9&mode=live&start=77.89144444444447) [and all the data present in the Realtime](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=9&mode=live&start=79.77400000000002) [Database. And finally, one last note, if](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=9&mode=live&start=82.95480000000002) [you're interested in the Google Cloud](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=9&mode=live&start=85.663) [Platform, here are some other interesting](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=9&mode=live&start=87.655) [courses that you can watch on Pluralsight.](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=9&mode=live&start=88.685) [If you're interested in the Firebase](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=9&mode=live&start=91.012) [mobile and app development platform,](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=9&mode=live&start=92.704) [Architecting Scalable Web Applications](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=9&mode=live&start=94.889) [with Firebase on the Google Cloud Platform](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=9&mode=live&start=96.713) [is the course for you. If you want to](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=9&mode=live&start=99.75)[build web applications, and want to try](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=9&mode=live&start=102.78157142857143) [out Google's Platform as a Service](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=9&mode=live&start=104.66433333333336) [offering, this course, Architecting](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=9&mode=live&start=106.38625) [Scalable Web Applications Using Google App](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=9&mode=live&start=108.47225) [Engine, is a course that you might find](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=9&mode=live&start=110.79349999999998) [interesting. It's time for me to say](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=9&mode=live&start=113.65299999999999) [goodbye now. I hope you enjoyed this course. Thank you for listening.](https://app.pluralsight.com/player?course=google-cloud-platform-firestore-leveraging-realtime-database-solutions&author=janani-ravi&name=cfbc63ee-f6a5-4b07-81ea-4674e5b0dda0&clip=9&mode=live&start=115.64324999999998)