**Intro**

* Firebase is a backend as a service.
* This means it provides backend services such as a database, authentication, file storage, cloud functions, hosting, and many other features.
* It is an alternative to setting up our own backend infrastructure with mongodb and nodejs

**Firebase 9 vs 8**

* The major change is that firebase 9 now adopts a more modular and functional approach which means we only import the firebase functions that we need.
  + Ex: version 9 project
    - Graphical user interface, text, application

      Description automatically generated
    - Notice we only imported the getAuth and onAuthStateChanged functions
* In contrast, firebase 8 used a more object-oriented approach where we directly called those firebase methods on firebase objects.
  + Ex: version 8 project
    - Text

      Description automatically generated
    - Notice we imported everything from firebase auth.
* By using a more modular approach, we can take advantage of tree-shaking. Tree shaking is where any unused code/functions can be removed from the final bundled JavaScript file. To do that, we will need to use a module bundler such as webpack

**Setting up webpack**

* In order to take advantage of tree shaking in firebase, we need to use a module bundler such as webpack.
* A module bundler is a tool that takes pieces of JavaScript and their dependencies and bundles them into a single file, usually for use in the browser.
* It is that js bundle that we link to in our html page.
* If we create an app using a cli tool such as ‘create-react-app’, then a modular bundler is often automatically setup for you. In those cases, we don’t need this section and can just start using firebase.
* However, if we are making an application using just html and vanilla JS, we need a modular bundler.
* Set up the following folder
* Graphical user interface, application

  Description automatically generated
* Make sure you have node js installed
* Make sure the project folder name is valid (has no spaces)
* Inside the project folder, the folder that contains dist and src, type in the cmd line: npm init -y
* Run: npm i webpack webpack-cli -D
* Create a webpack.config.js file in the project folder. Inside the folder is where we config what we want the webpack to do. We want it to look at our src/index.js file and any other imports and bundle all of that code into a single bundle file.
* To do this, we need to export an object that represents our webpack configuration by copy pasting the following into the webpack.config.js file:
  + <https://raw.githubusercontent.com/iamshaunjp/Getting-Started-with-Firebase-9/lesson-2/webpack.config.js>
  + Text

    Description automatically generated
* Module.exports exports an object from the file and this object has properties that represents the configuration of webpack.
* The mode property can be production or development. Since we are developing, we choose development.
* The entry property is the path to an entry file. This path tells webpack where to look for our index.js file.
* The output property is an object.
  + This object has a property called path which is the path to where we want the output file to be put into. We want it inside the dist folder. In order to create this path, we need to use path module which we require in line 1. This is a core node module. We cannot use a relative path here, we must have an absolute path which is why we need node.
  + The object has a property called filename which is just the filename of the output file.
* The watch property is true which means that when we run webpack, every change we make is going to bundle up the new code into the bundle.js file.
* Now, we want to run webpack which we can do by running a custom script in our package.json file.
* Text

  Description automatically generated
* We didn’t have to name it build, we could have named it whatever wanted.
* Now, when we run the build command, the webpack command is ran which runs webpack according to our configuration.
* We can test that our webpack is working properly by adding a console.log(“hi”) to our index.js file.
* Then, in cmd: npm run build
* Recall that build was the name of the script
* This script will make webpack take our source code and bundle it into the bundle.js output file in the disc folder. As well, it will also be watching our index.js file for changes so that it rebundles every time we make a change and then save the file.
* Note that we also need to link to the new bundle.js file in the index.html file.

**Setting up firebase**

* Sign up for a firebase account
* Go to Firebase console at console.firebae.google.com which is where all of our firebase projects are listed.
* Generally, each different application we create will have a new firebase project for it
* Create a new project, type in any project name you want, you can remove google analytics (having google analytics is optional), click create project, and then click continue to go to the dashboard for that project
* We need to create a frontend project to connect with the dashboard which will manage the backend of the project
* We can create a web app so click the web app icon right under the project name, give it any name you want, we don’t need to check the set up firebase hosting, click register app, then click continue to console.
* Graphical user interface, text, application, chat or text message

  Description automatically generated
* Notice that 1 app icon which represents the app we just registered. This is the app that our frontend will connect to. Click on 1 app then click on the cog to go to settings then scroll down and toggle config to get the config object.
* Graphical user interface, text, application, email

  Description automatically generated
* This config object contains information about our firebase project that will allow our frontend to connect to our backend
* In index.js, paste in the config object.
* However, while this config object contains information, we are not doing anything with the information. Thus, we first need to install firebase by running in a new cmd terminal (not the webpack run build terminal): npm install firebase
* Now, we can use some firebase functions to initialize our app.
* Text

  Description automatically generated

**Firestore Setup**

* Now that we connected our frontend to the firebase backend, we can set up a database
* First, we need to enable that database
* The database we will be using is the Firestore database. There is an older realtime database, but Firestore will be used instead.
* Graphical user interface, application

  Description automatically generated
* Click create database, start in test mode, then click next. Choose a firestore location, click enable, and now, we have a database created for us.
* This database is split up into collections and documents.
* We can have a collection of certain datatypes. For example, we could have a datatype called books and they would all be in a collection called books.
* To make a collection, click start collection, give it a collection id/name such as books.
* Then, we need to create our first document inside that collection. Each document has to have a document id so if we need to grab a document from the database, we can use the id. We can click auto-id to automatically generate an id.
* Inside the document, we have different properties/fields and values. For example, a field could be title and its value could be harry potter. We can also specify the datatype to be a string, number. We could have another field to be author and its value could be jk rowling.
* Then, we can click save and that’ll create a new id inside the firestore database.
* We can also create some more dummy data.

**Fetching firestore data**

* Firstly, we need to initialize the firestore service on the frontend so we can connect to it.
* To do that, import: getFireStore. Note that this naming convention of getService is common for many firebase services
* We can execute the getFireStore function to initialize the firestore service. Thus, we say const db = getFireStore(). This db constant will represent our database connection. Anytime we reach out to get data, we’re going to use the db constant.
* Now, we need to get a reference to a specific collection in our database.
* We will import a function called collection that will enable us to get a reference to a specific collection. This collection function takes in two arguments. The first argument is the database we will be looking in which in our case is db. The second argument is the collection we will be looking for such as ‘books’. This function returns a collection reference.
* We can import the getDocs function that will enable us to get the collection data. We pass in a collection reference as argument. In our example, we pass in colRef to the argument of the getDocs. This getDocs returns a promise. We can then add a .then method which takes in a snapshot object of that collection in that moment in time when we reach out to get it. We can then simply log out snapshot.docs and this docs is a property of snapshotl which represents all of the documents.
* As of now, our code can might look like the following:
* Text

  Description automatically generated
* The console would log the following:
* Text

  Description automatically generated
* We probably don’t need all of these properties, we probably just want the data and the id.
* The data is grabbed by using a data function. We can grab the id from the id property.
* We can now go through each document in snapshot.docs and then use the spread operator to get all the fields of the data along with the id property.
* Text

  Description automatically generated
* Text

  Description automatically generated

**Adding and Deleting Firebase Documents**

* Firstly, we can add a form to our html file that will allow the user to add information/ delete information.
* Text

  Description automatically generated
* To add documents, we need to import the addDoc function from firebase which will allow us to add a new document to a specific collection.
* Then, we can use that function by executing it. The function takes in two arguments, the first is a collection reference which is the collection we want to add to. The second argument is an object that represents the new document that we want to add to the particular collection. This addDoc function is asynchronous so we can attach a .then method. Inside the .then method, we can reset the fields of the form to be empty for better use experience.
* Text

  Description automatically generated
* To delete documents, we need to import the deleteDoc and doc functions from firebase.
* The doc function is similar to the collection function in the sense that we get a reference. However, instead of getting a reference to a collection which is what the collection function does, the doc function gets us a reference to a doc. The doc function takes in 3 arguments. The first argument is a database. The second argument is the collection. The third argument is the id of the document that we want to reference to.
* Now that we have a refence to a specific document by using the doc function, we can now delete the document by using the deleteDoc function.
* The deleteDoc function takes in 1 parameter which is a reference to a document that we want to delete. We can execute the function. Moreover, this function is asynchronous so we can add a .then method. Inside the .then method, we can reset the fields of the form to be empty for better use experience.