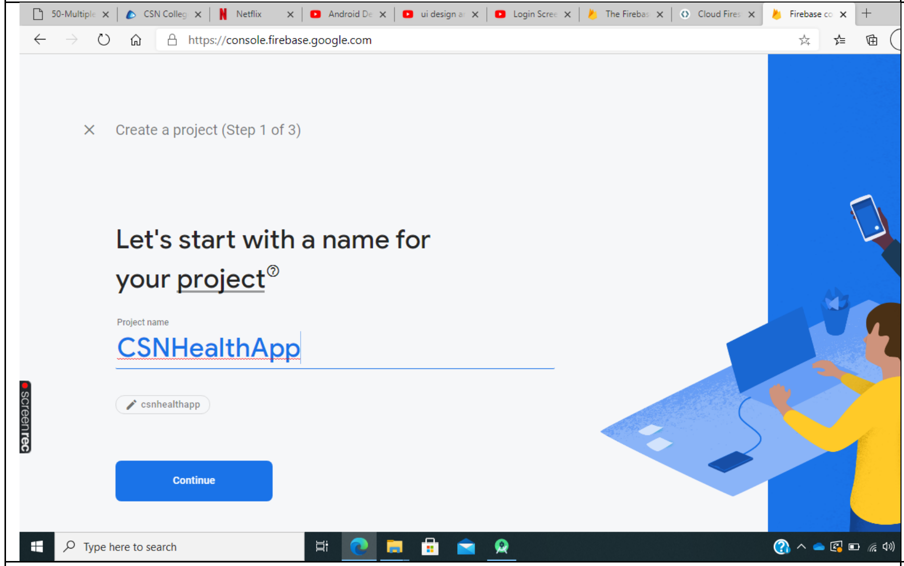
Adding Firebase Services to Android Apps

<table>
<tr><th>Firebase Console</th><th>Android Studio</th></tr>
<tr><td>Login to https://console.firebase.google.com/ using your Google account</td><td>Create a new Project in Android Studio and copy the Android package name which will be required to enter in Firebase. Firebase will request this name as shown com.raymundoconnor.rayhealthappnew See project name highlighted below.</td></tr>
<tr><td>


https://console.firebase.google.com

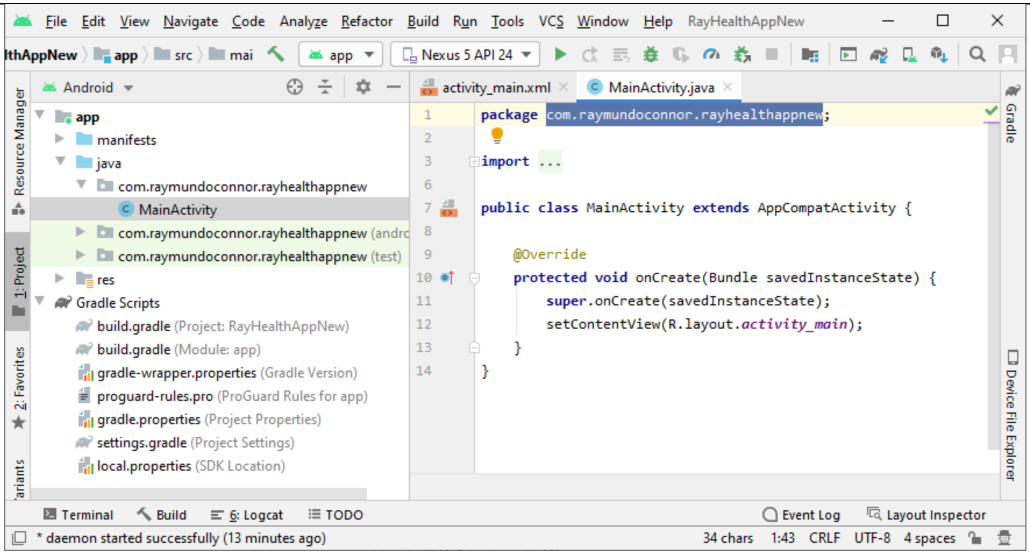
Create a project (Step 1 of 3)

Let's start with a name for your project

Project name

CSNHealthApp

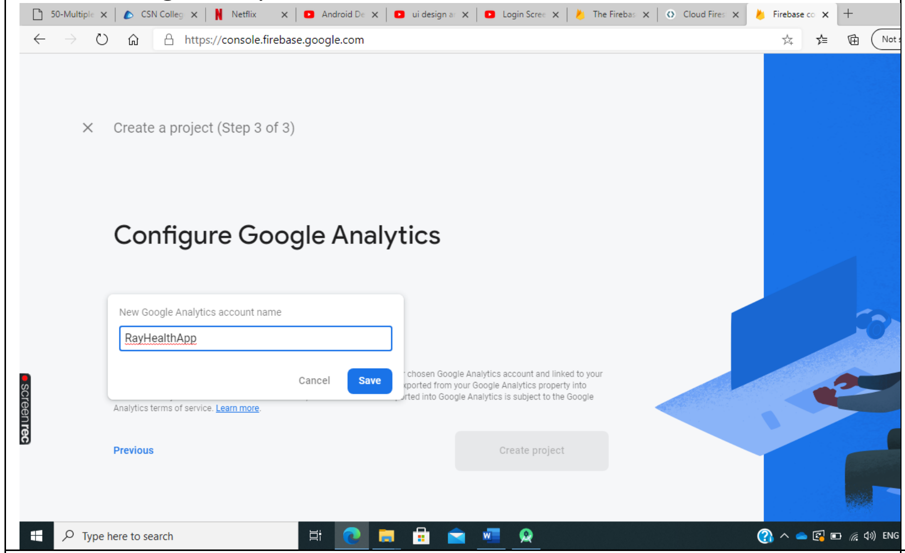
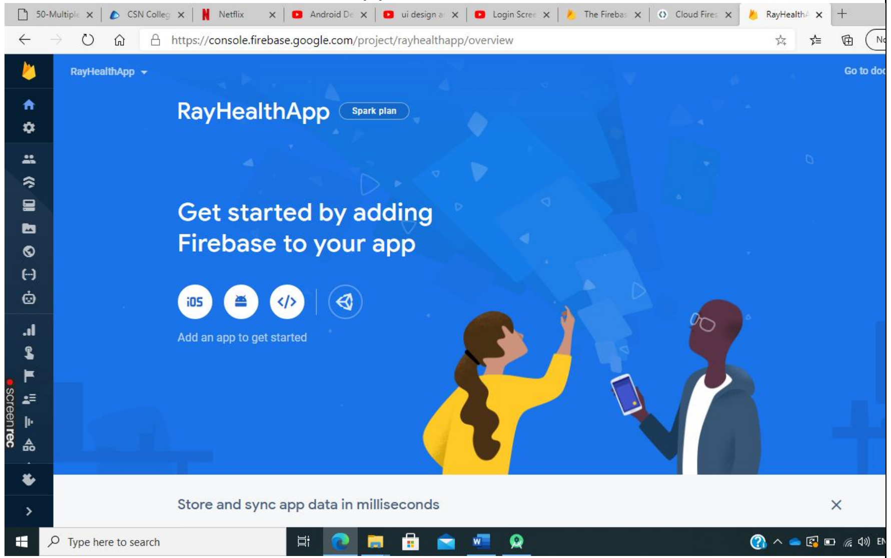
csnhealthapp

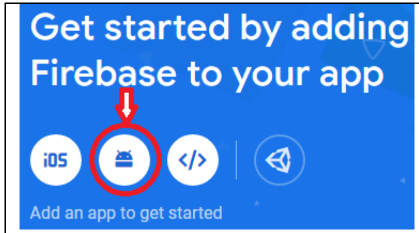
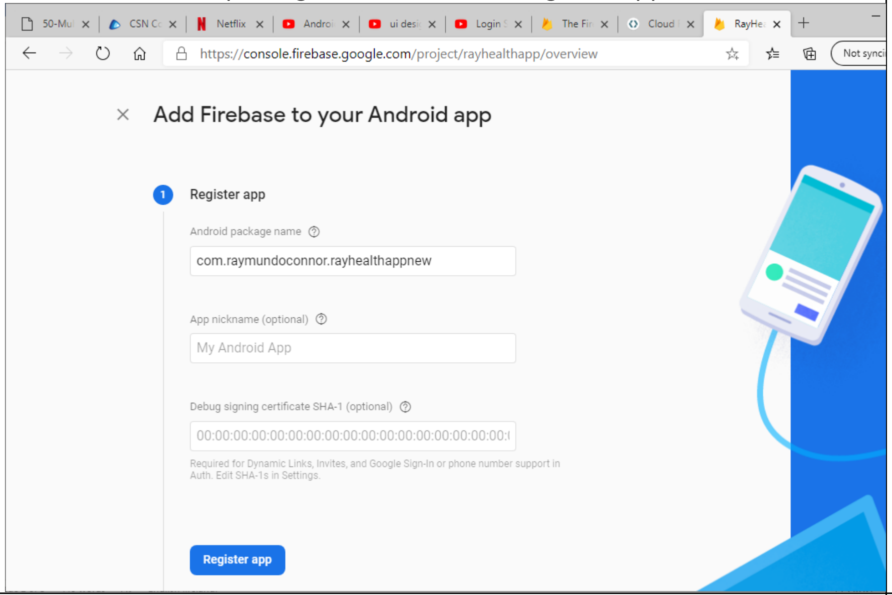
Continue
</td><td>


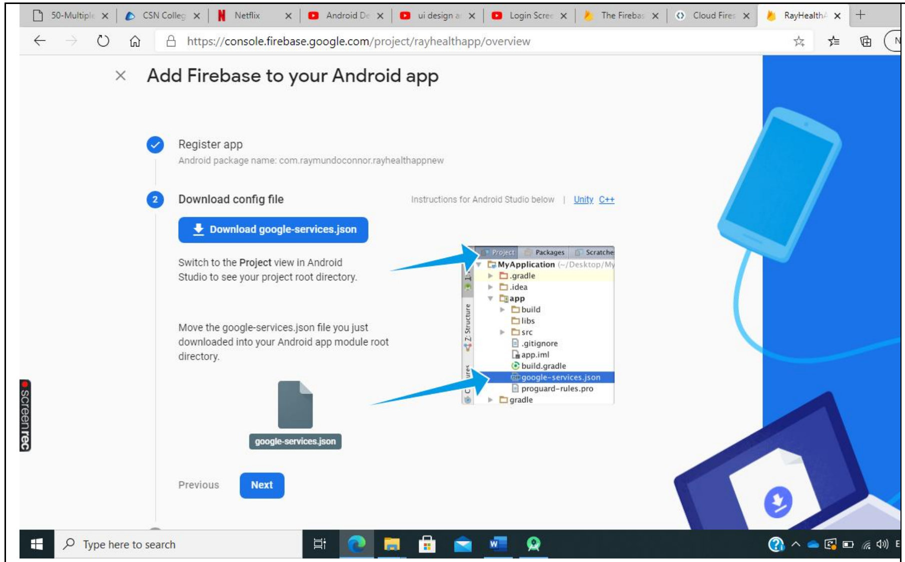
```
app
  manifests
  java
    com.raymundoconnor.rayhealthappnew
      MainActivity
    com.raymundoconnor.rayhealthappnew (andrc
    com.raymundoconnor.rayhealthappnew (test)
  res
Gradle Scripts
  build.gradle (Project: RayHealthAppNew)
  build.gradle (Module: app)
  gradle-wrapper.properties (Gradle Version)
  proguard-rules.pro (ProGuard Rules for app)
  gradle.properties (Project Properties)
  settings.gradle (Project Settings)
  local.properties (SDK Location)
```

```
package com.raymundoconnor.rayhealthappnew;

import ...

public class MainActivity extends AppCompatActivity {

    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
    }
}
```

```
* daemon started successfully (13 minutes ago)
```
</td></tr>
<tr><td>Name your project (eg RayHealthApp)</td><td></td></tr>
<tr><td>Ensure to enable Enable Google Analytics for this project and click <b>Continue</b></td><td></td></tr>
</table>

Enter a Google Analytics account name and click **Save**  Create a project (Step 3 of 3) Configure Google Analytics New Google Analytics account name: RayHealthApp https://console.firebase.google.com Cancel Save Previous Create project	
Select Ireland Analytics Location and check all boxes terms/agreement boxes and click Create Project	
Now we add Firebase to our app  RayHealthApp Get started by adding Firebase to your app Add an app to get started Store and sync app data in milliseconds https://console.firebase.google.com/project/rayhealthapp/overview Spark plan iOS Click Android in our case as we are developing for Android as circled in Red below	

 Get started by adding Firebase to your app Add an app to get started	
Enter the Android package name and click Register App  https://console.firebase.google.com/project/rayhealthapp/overview Add Firebase to your Android app 1 Register app Android package name: com.raymundoconnor.rayhealthappnew App nickname (optional): My Android App Debug signing certificate SHA-1 (optional): 00:00:00:00:00:00:00:00:00:00:00:00:00:00:00:00:00:00:00:00 Required for Dynamic Links, Invites, and Google Sign-In or phone number support in Auth. Edit SHA-1s in Settings. 	
Download the Google Services json file by clicking on it as follows	

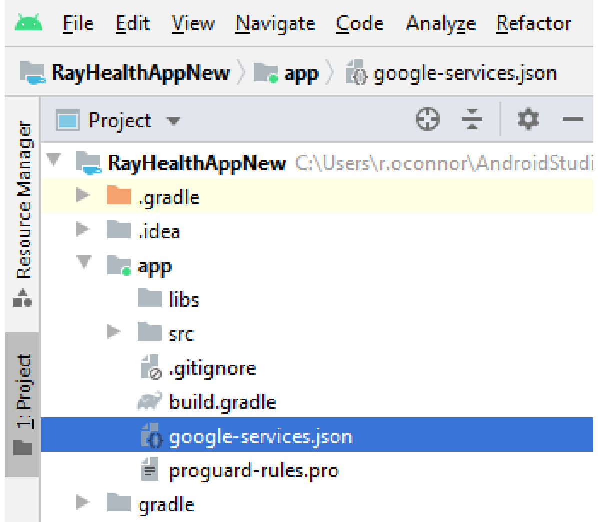


https://console.firebase.google.com/project/rayhealthapp/overview
Add Firebase to your Android app
Register app
Android package name: com.raymundoconnor.rayhealthappnew
Download config file
Instructions for Android Studio below | Unity C++
Download google-services.json
Switch to the Project view in Android Studio to see your project root directory.
Move the google-services.json file you just downloaded into your Android app module root directory.
google-services.json
Previous
Next
Type here to search

Once downloaded copy this file.

Switch to the Project view in Android Studio to see your project root directory.
Move the google-services.json file you just downloaded into your Android app module root directory.

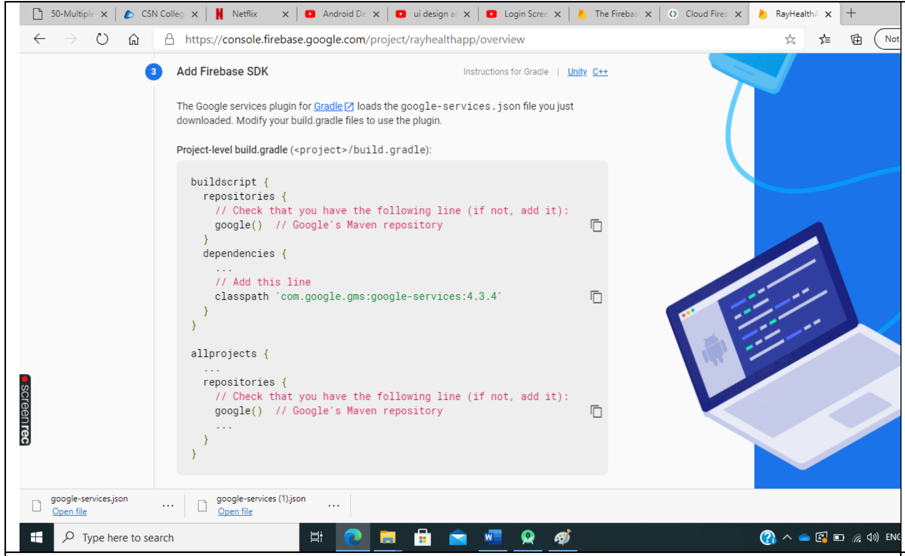
Click Next to move to next step



File Edit View Navigate Code Analyze Refactor
RayHealthAppNew 〉 app 〉 google-services.json
Project
Resource Manager
1: Project
RayHealthAppNew C:\Users\r.oconnor\AndroidStudi
.gradle
.idea
app
libs
src
.gitignore
build.gradle
google-services.json
proguard-rules.pro
gradle

Using the image below make the changes to the build,gradle in Android Studio

Once the dependencies etc are added to build.gradle in the Project folder click Sync Now as shown



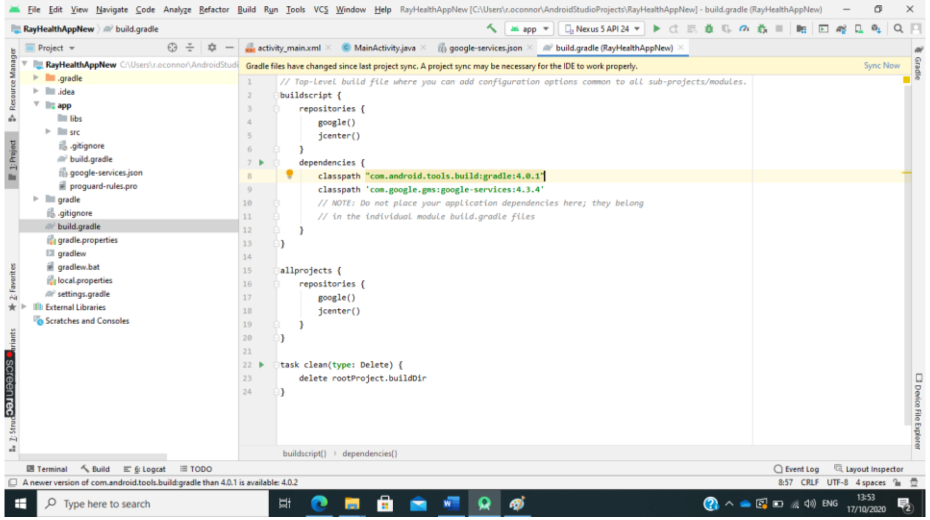
https://console.firebase.google.com/project/rayhealthapp/overview

3 Add Firebase SDK — Instructions for Gradle | Unity C++

The Google services plugin for Gradle loads the google-services.json file you just downloaded. Modify your build.gradle files to use the plugin.

Project-level build.gradle (<project>/build.gradle):

```
buildscript {
  repositories {
    // Check that you have the following line (if not, add it):
    google()  // Google's Maven repository
  }
  dependencies {
    ...
    // Add this line
    classpath 'com.google.gms:google-services:4.3.4'
  }
}

allprojects {
  ...
  repositories {
    // Check that you have the following line (if not, add it):
    google()  // Google's Maven repository
    ...
  }
}
```



RayHealthAppNew [C:\Users\r.oconnor\AndroidStudioProjects\RayHealthAppNew] - build.gradle (RayHealthAppNew)

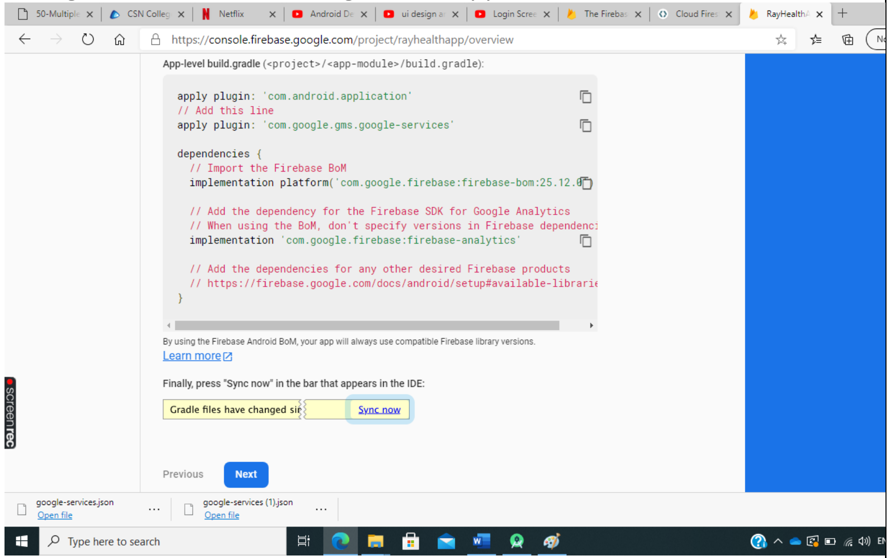
Gradle files have changed since last project sync. A project sync may be necessary for the IDE to work properly. Sync Now

```
// Top-level build file where you can add configuration options common to all sub-projects/modules.
buildscript {
    repositories {
        google()
        jcenter()
    }
    dependencies {
        classpath "com.android.tools.build:gradle:4.0.1"
        classpath 'com.google.gms:google-services:4.3.4'
        // NOTE: Do not place your application dependencies here; they belong
        // in the individual module build.gradle files
    }
}

allprojects {
    repositories {
        google()
        jcenter()
    }
}

task clean(type: Delete) {
    delete rootProject.buildDir
}
```

A newer version of com.android.tools.build:gradle than 4.0.1 is available: 4.0.2

Change to be made to build.gradle in App folder as follows

Add the code, etc as shown to build.gradle in app folder and click Sync now



https://console.firebase.google.com/project/rayhealthapp/overview

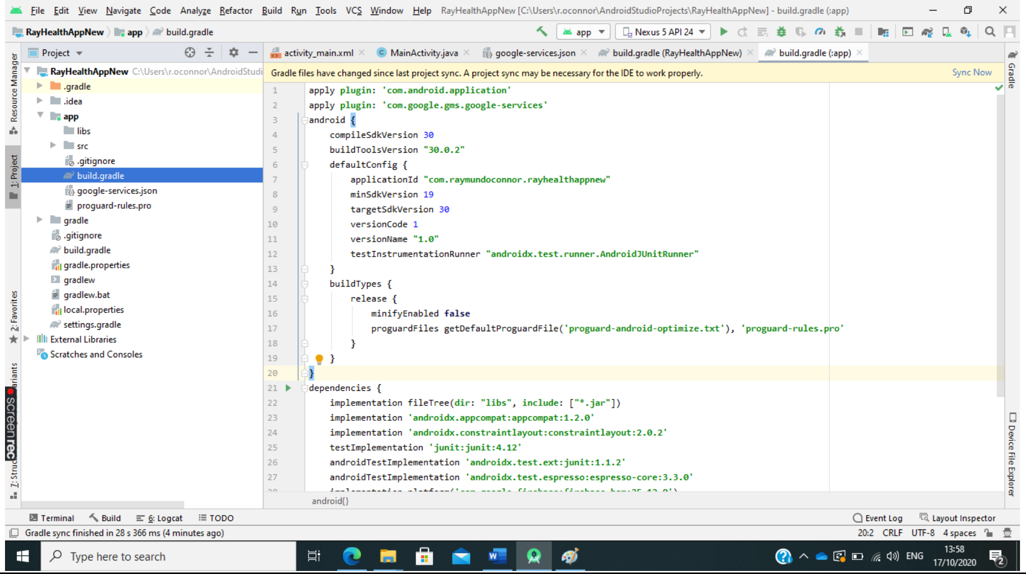
App-level build.gradle (<project>/<app-module>/build.gradle):

```
apply plugin: 'com.android.application'
// Add this line
apply plugin: 'com.google.gms.google-services'

dependencies {
  // Import the Firebase BoM
  implementation platform('com.google.firebase:firebase-bom:25.12.0')

  // Add the dependency for the Firebase SDK for Google Analytics
  // When using the BoM, don't specify versions in Firebase dependenci
  implementation 'com.google.firebase:firebase-analytics'

  // Add the dependencies for any other desired Firebase products
  // https://firebase.google.com/docs/android/setup#available-librarie
}
```

By using the Firebase Android BoM, your app will always use compatible Firebase library versions. Learn more

Finally, press "Sync now" in the bar that appears in the IDE:

Gradle files have changed si Sync now



RayHealthAppNew [C:\Users\r.oconnor\AndroidStudioProjects\RayHealthAppNew] - build.gradle (:app)

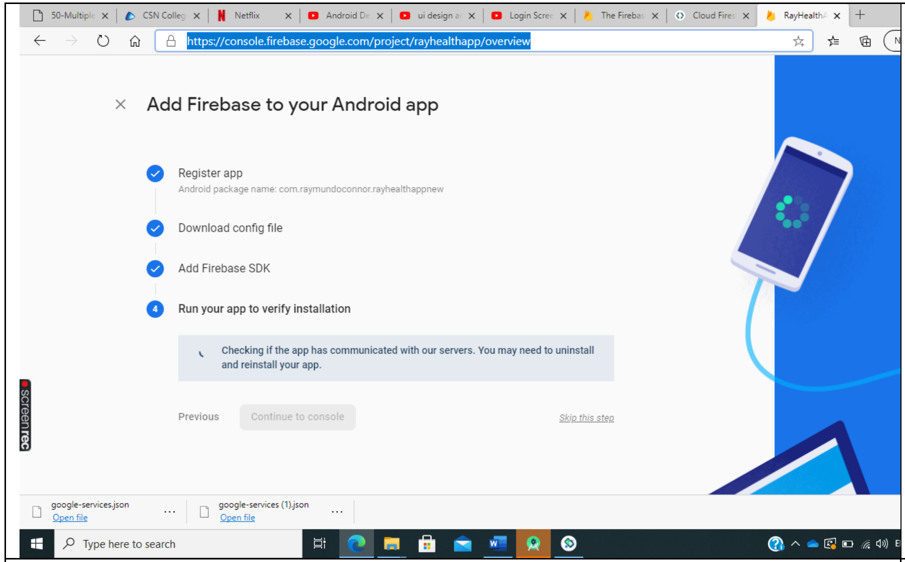
Gradle files have changed since last project sync. A project sync may be necessary for the IDE to work properly. Sync Now

```
apply plugin: 'com.android.application'
apply plugin: 'com.google.gms.google-services'
android {
    compileSdkVersion 30
    buildToolsVersion "30.0.2"
    defaultConfig {
        applicationId "com.raymundoconnor.rayhealthappnew"
        minSdkVersion 19
        targetSdkVersion 30
        versionCode 1
        versionName "1.0"
        testInstrumentationRunner "androidx.test.runner.AndroidJUnitRunner"
    }
    buildTypes {
        release {
            minifyEnabled false
            proguardFiles getDefaultProguardFile('proguard-android-optimize.txt'), 'proguard-rules.pro'
        }
    }
}
dependencies {
    implementation fileTree(dir: "libs", include: ["*.jar"])
    implementation 'androidx.appcompat:appcompat:1.2.0'
    implementation 'androidx.constraintlayout:constraintlayout:2.0.2'
    testImplementation 'junit:junit:4.12'
    androidTestImplementation 'androidx.test.ext:junit:1.1.2'
    androidTestImplementation 'androidx.test.espresso:espresso-core:3.3.0'
```

Gradle sync finished in 28 s 366 ms (4 minutes ago)

Once you run your app in Android Studio it should synchrnoise as follows

App should run as shown – notice we have nothing adding as yet except the default TextView displaying “Hello World”

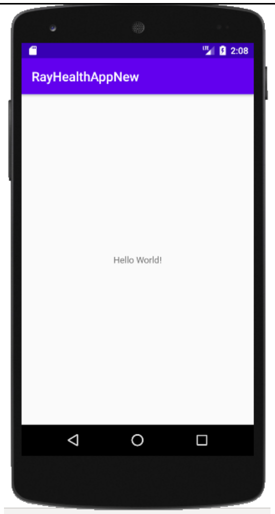


https://console.firebase.google.com/project/rayhealthapp/overview

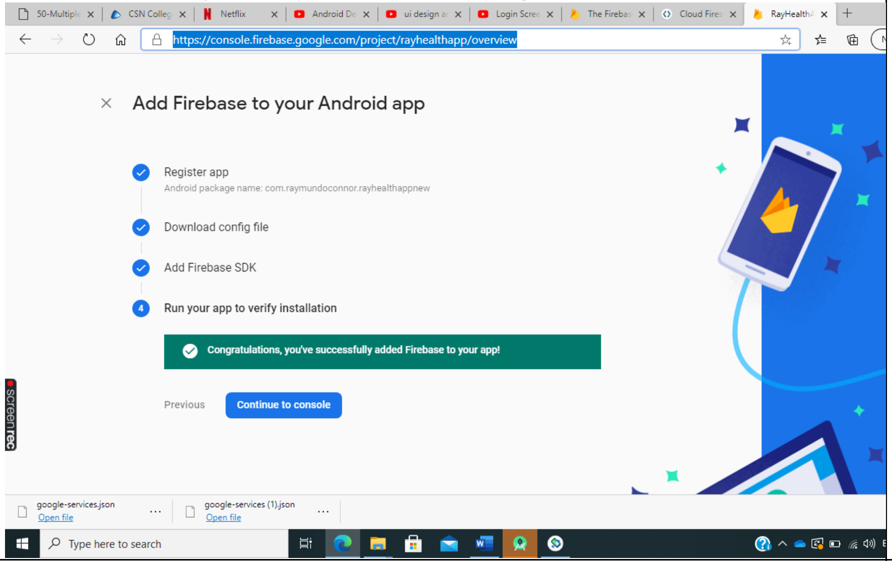
Add Firebase to your Android app

- Register app
  Android package name: com.raymundoconnor.rayhealthappnew
- Download config file
- Add Firebase SDK
- 4 Run your app to verify installation

Checking if the app has communicated with our servers. You may need to uninstall and reinstall your app.



Once successful you will receive this message



https://console.firebase.google.com/project/rayhealthapp/overview

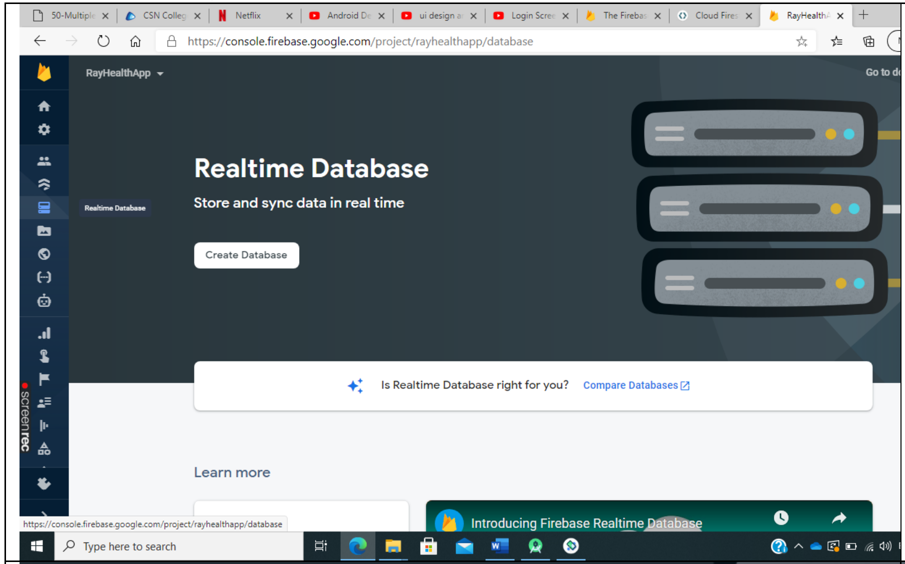
Add Firebase to your Android app

- Register app
  Android package name: com.raymundoconnor.rayhealthappnew
- Download config file
- Add Firebase SDK
- 4 Run your app to verify installation

Congratulations, you've successfully added Firebase to your app!

Creating the Realtime Database

Create on Realtime Database in Firebase and click on Create Database



https://console.firebase.google.com/project/rayhealthapp/database

RayHealthApp

Realtime Database

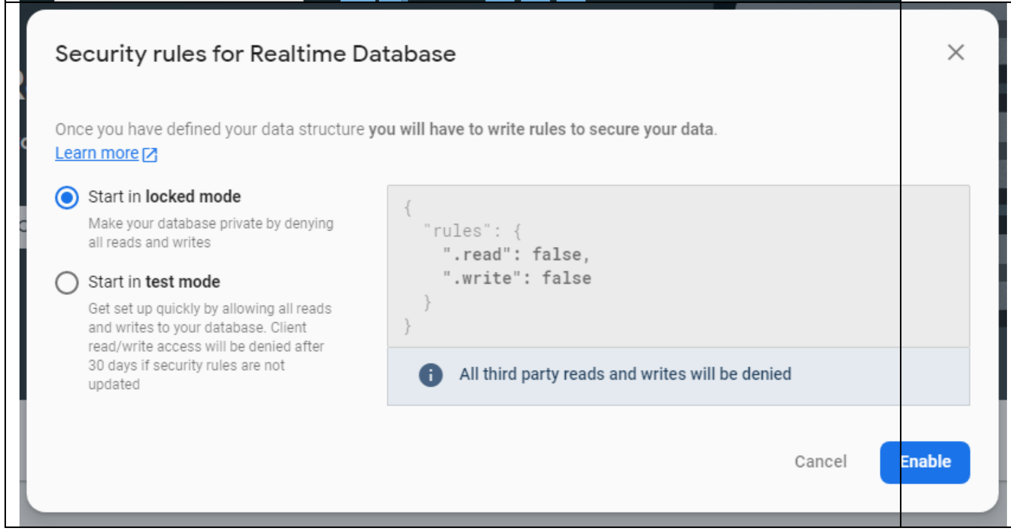
Store and sync data in real time

Create Database

Is Realtime Database right for you? Compare Databases

Learn more

Introducing Firebase Realtime Database



Security rules for Realtime Database

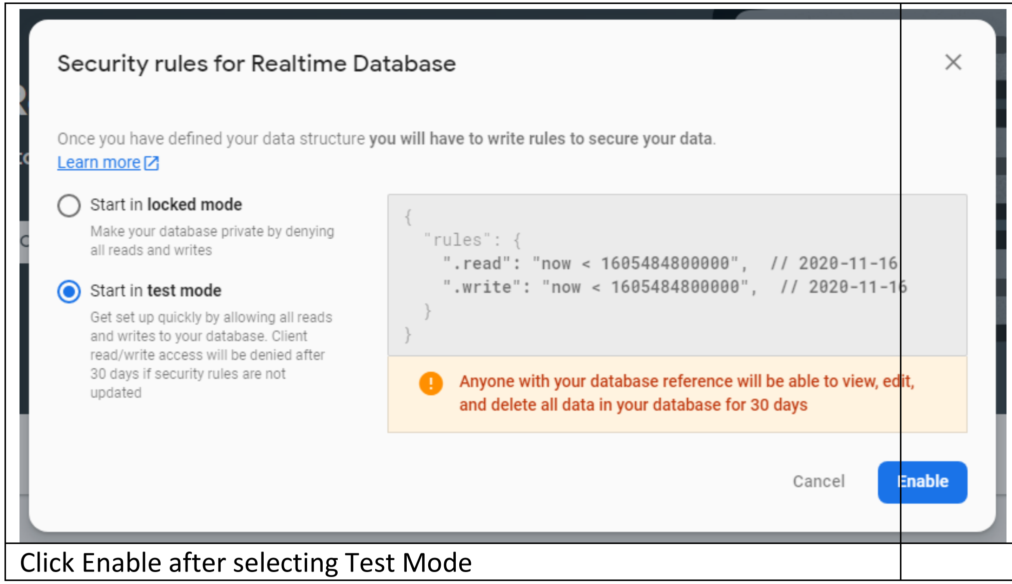
Once you have defined your data structure **you will have to write rules to secure your data.**
Learn more

● Start in **locked mode**
Make your database private by denying all reads and writes

○ Start in **test mode**
Get set up quickly by allowing all reads and writes to your database. Client read/write access will be denied after 30 days if security rules are not updated

```
{
  "rules": {
    ".read": false,
    ".write": false
  }
}
```

All third party reads and writes will be denied

	
Click Enable after selecting Test Mode	

Security rules for Realtime Database

Once you have defined your data structure **you will have to write rules to secure your data.**
Learn more

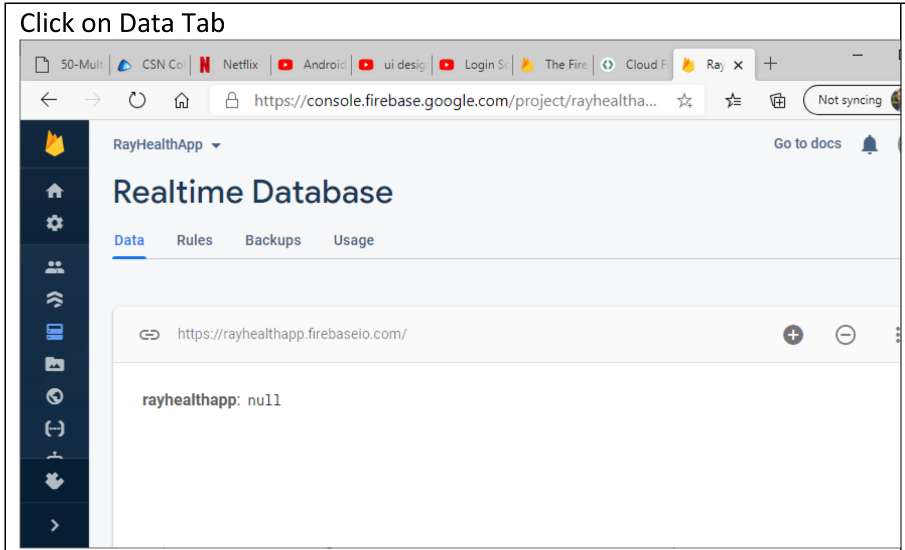
○ Start in **locked mode**
Make your database private by denying all reads and writes

● Start in **test mode**
Get set up quickly by allowing all reads and writes to your database. Client read/write access will be denied after 30 days if security rules are not updated

```
{
  "rules": {
    ".read": "now < 1605484800000",  // 2020-11-16
    ".write": "now < 1605484800000",  // 2020-11-16
  }
}
```

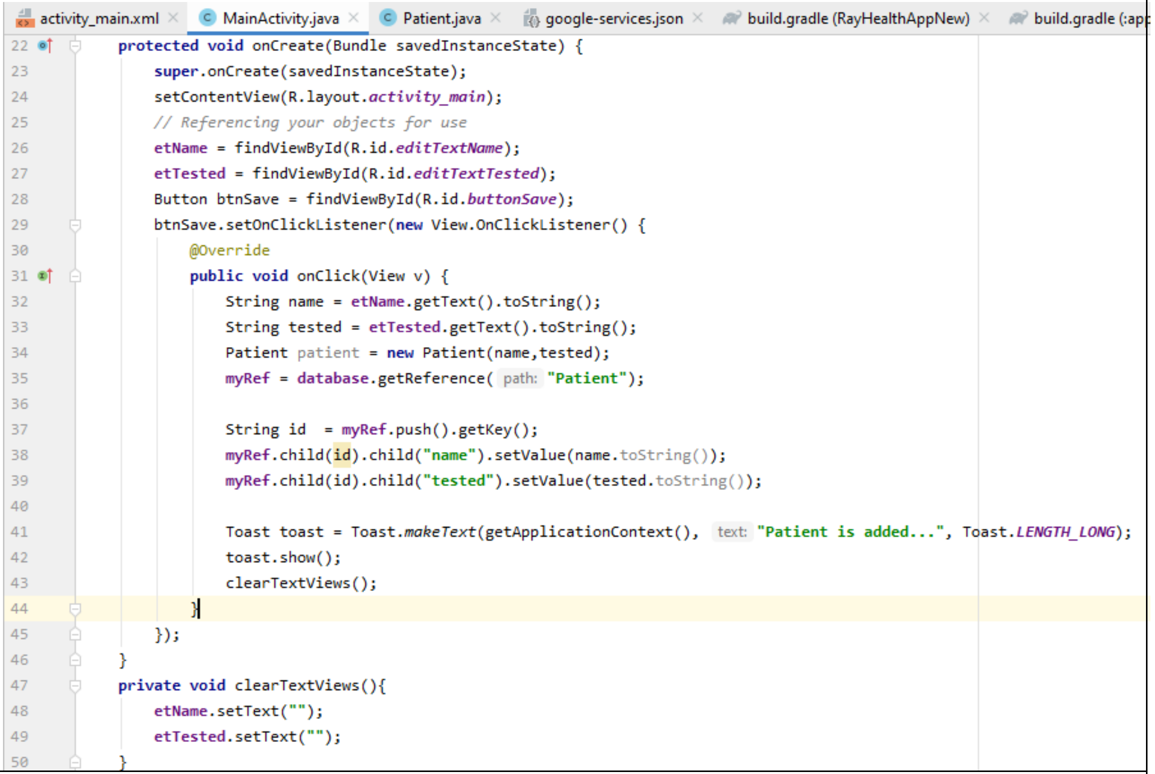
Anyone with your database reference will be able to view, edit, and delete all data in your database for 30 days

Click on Data Tab



rayhealthapp: null

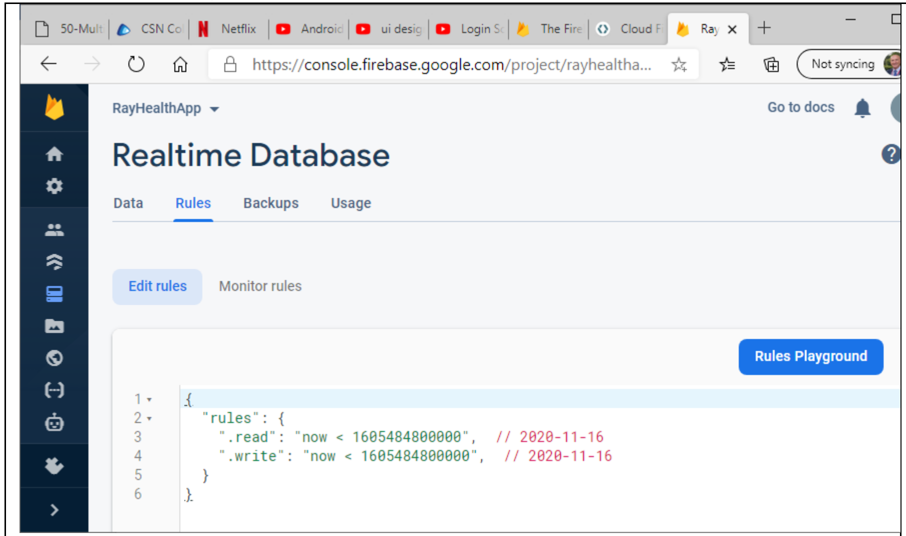
Enter the source code below in MainActivity.java



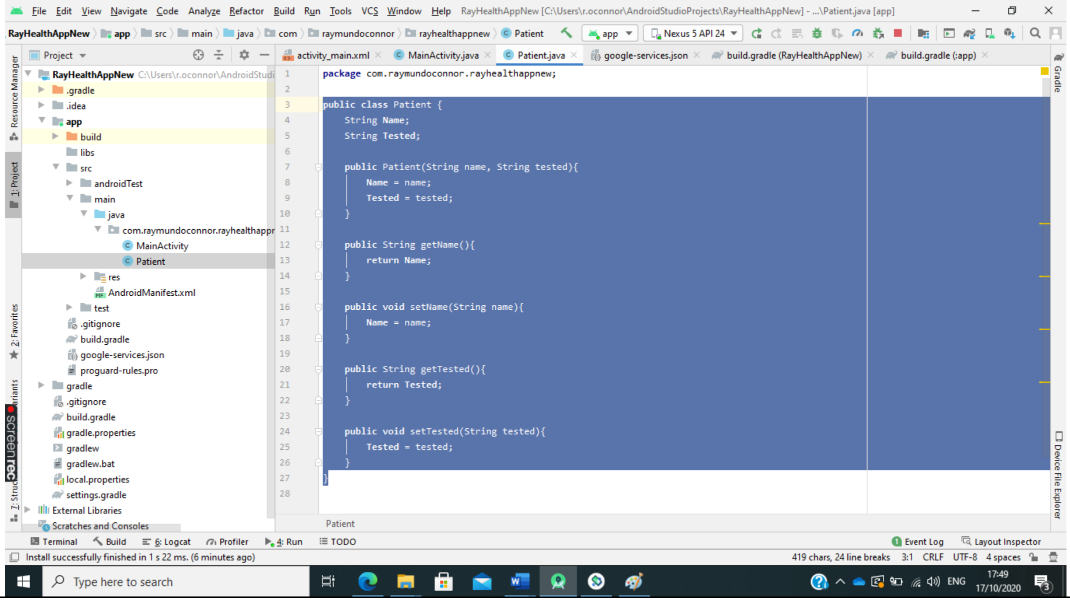
```java
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        // Referencing your objects for use
        etName = findViewById(R.id.editTextName);
        etTested = findViewById(R.id.editTextTested);
        Button btnSave = findViewById(R.id.buttonSave);
        btnSave.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                String name = etName.getText().toString();
                String tested = etTested.getText().toString();
                Patient patient = new Patient(name,tested);
                myRef = database.getReference( "Patient");

                String id  = myRef.push().getKey();
                myRef.child(id).child("name").setValue(name.toString());
                myRef.child(id).child("tested").setValue(tested.toString());

                Toast toast = Toast.makeText(getApplicationContext(),  "Patient is added...", Toast.LENGTH_LONG);
                toast.show();
                clearTextViews();
            }
        });
    }
    private void clearTextViews(){
        etName.setText("");
        etTested.setText("");
    }
```

Click on Rules Tab

We have to create a Patient class as we have two or more variables such as Name and Tested

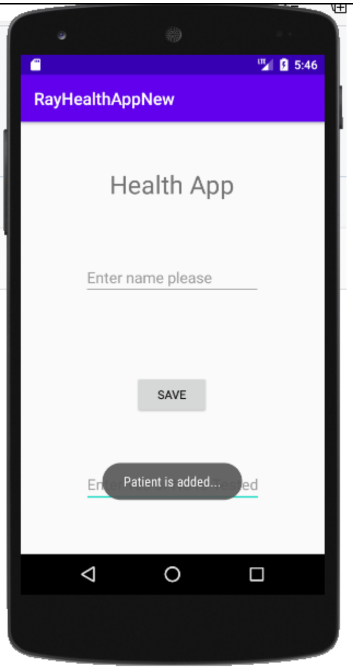


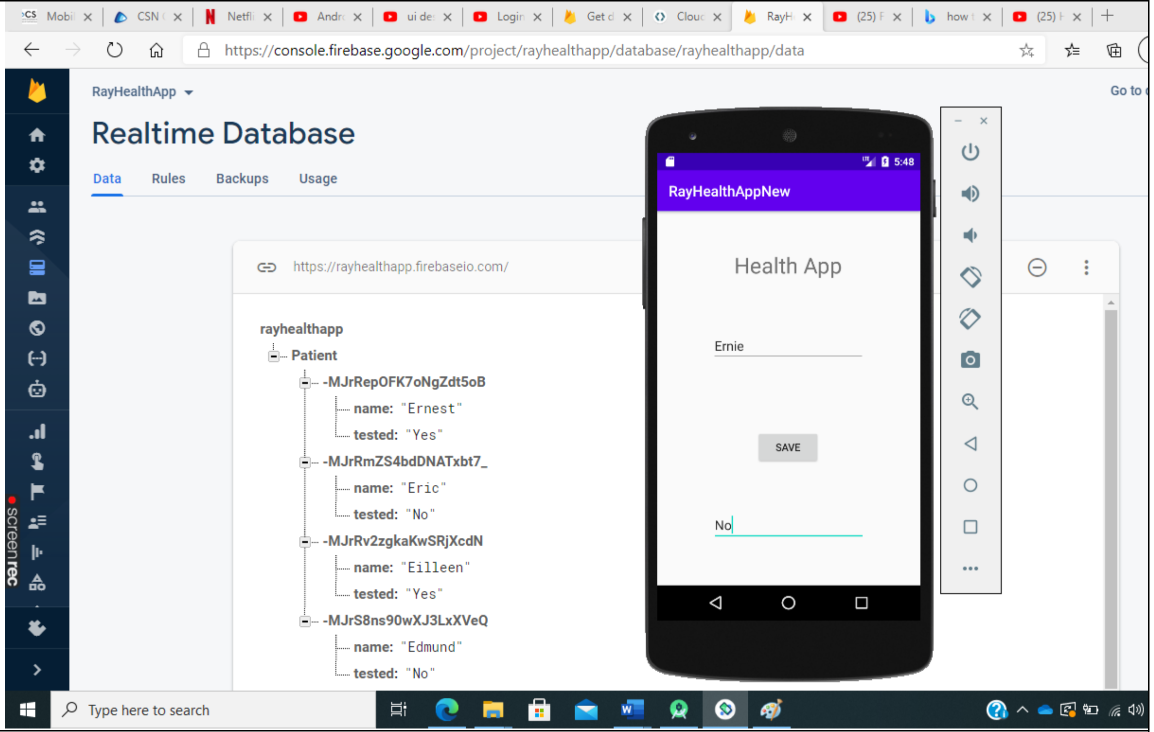
```
{
  "rules": {
    ".read": "now < 1605484800000",  // 2020-11-16
    ".write": "now < 1605484800000",  // 2020-11-16
  }
}
```

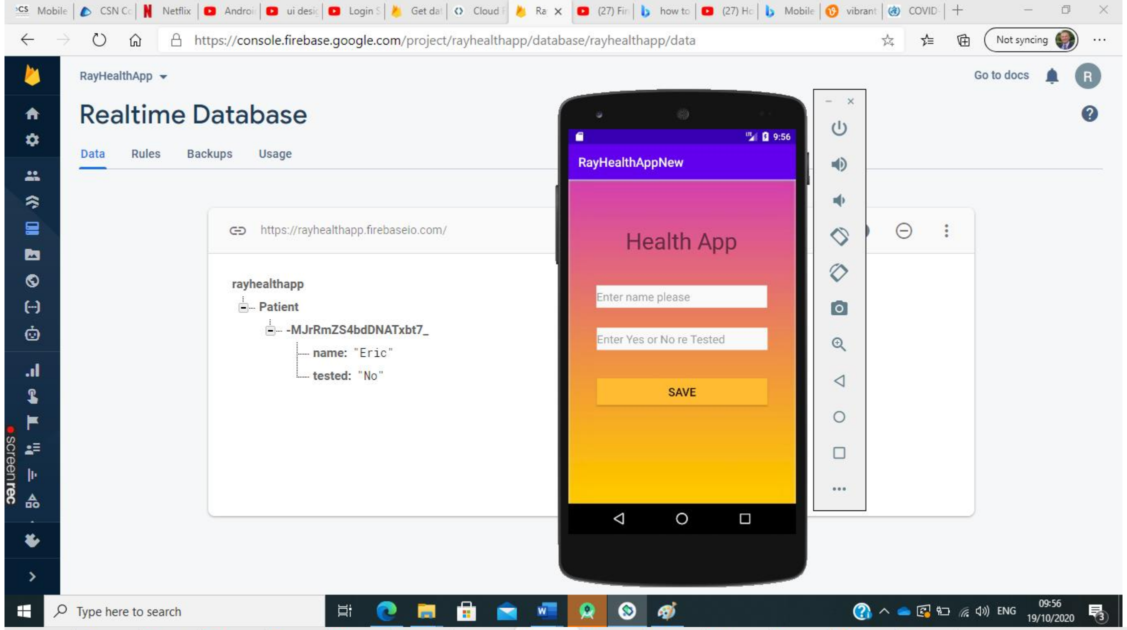

RayHealthAppNew [C:\Users\r.oconnor\AndroidStudioProjects\RayHealthAppNew] - ...\Patient.java [app]
activity_main.xml
MainActivity.java
Patient.java
google-services.json
build.gradle (RayHealthAppNew)
build.gradle (:app)
Nexus 5 API 24

```
package com.raymundoconnor.rayhealthappnew;

public class Patient {
    String Name;
    String Tested;

    public Patient(String name, String tested){
        Name = name;
        Tested = tested;
    }

    public String getName(){
        return Name;
    }

    public void setName(String name){
        Name = name;
    }

    public String getTested(){
        return Tested;
    }

    public void setTested(String tested){
        Tested = tested;
    }
}
```

Install successfully finished in 1 s 22 ms. (6 minutes ago)



	 https://console.firebase.google.com/project/rayhealthapp/database/rayhealthapp/data RayHealthApp Realtime Database Data Rules Backups Usage https://rayhealthapp.firebaseio.com/ rayhealthapp Patient -MJrRepOFK7oNgZdt5oB name: "Ernest" tested: "Yes" -MJrRmZS4bdDNATxbt7_ name: "Eric" tested: "No" -MJrRv2zgkaKwSRjXcdN name: "Eilleen" tested: "Yes" -MJrS8ns90wXJ3LxXVeQ name: "Edmund" tested: "No" RayHealthAppNew Health App Ernie SAVE No
Notes from my Firebase console https://console.firebase.google.com/project/rayhealthapp/overview	



Realtime Database

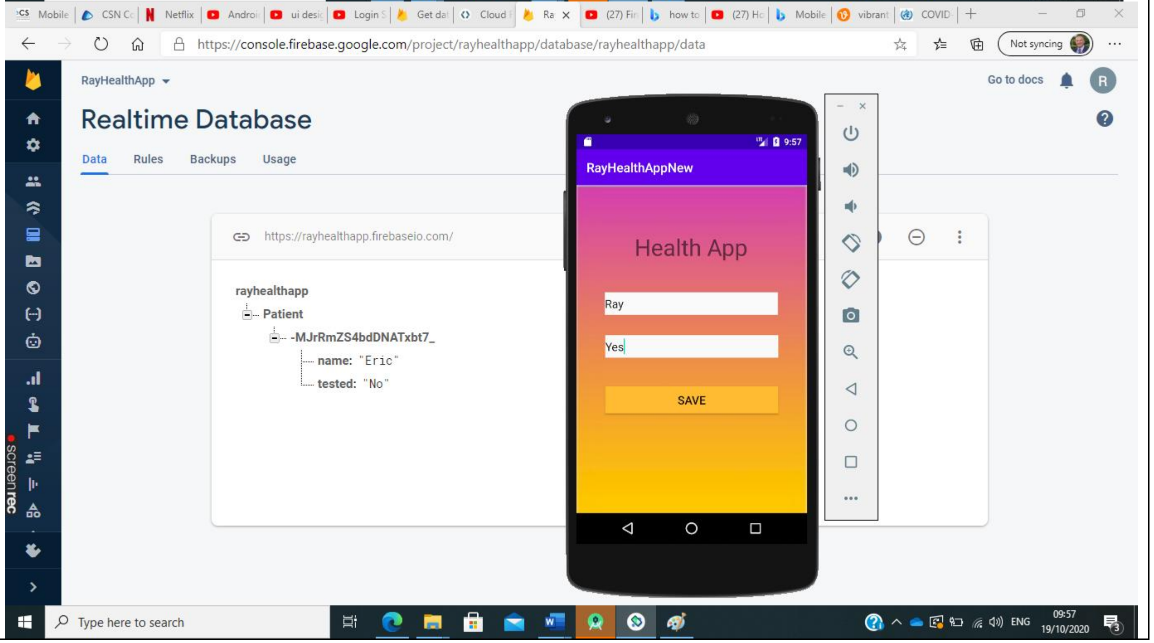
https://rayhealthapp.firebaseio.com/

```
rayhealthapp
  Patient
    -MJrRmZS4bdDNATxbt7_
      name: "Eric"
      tested: "No"
```

Health App

Enter name please

Enter Yes or No re Tested



Realtime Database

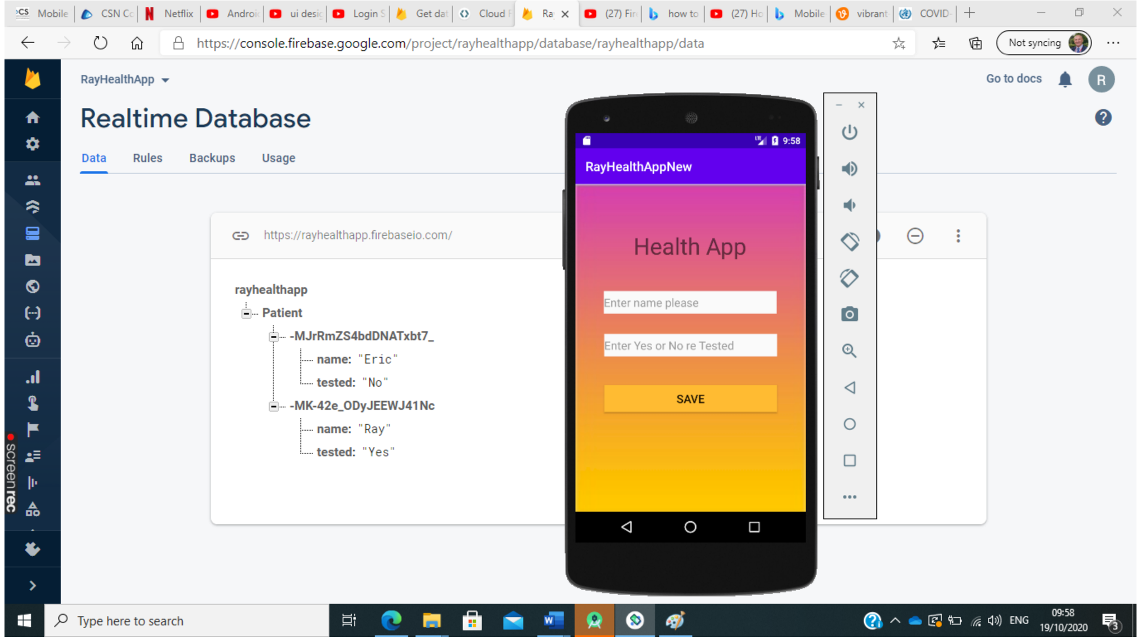
https://rayhealthapp.firebaseio.com/

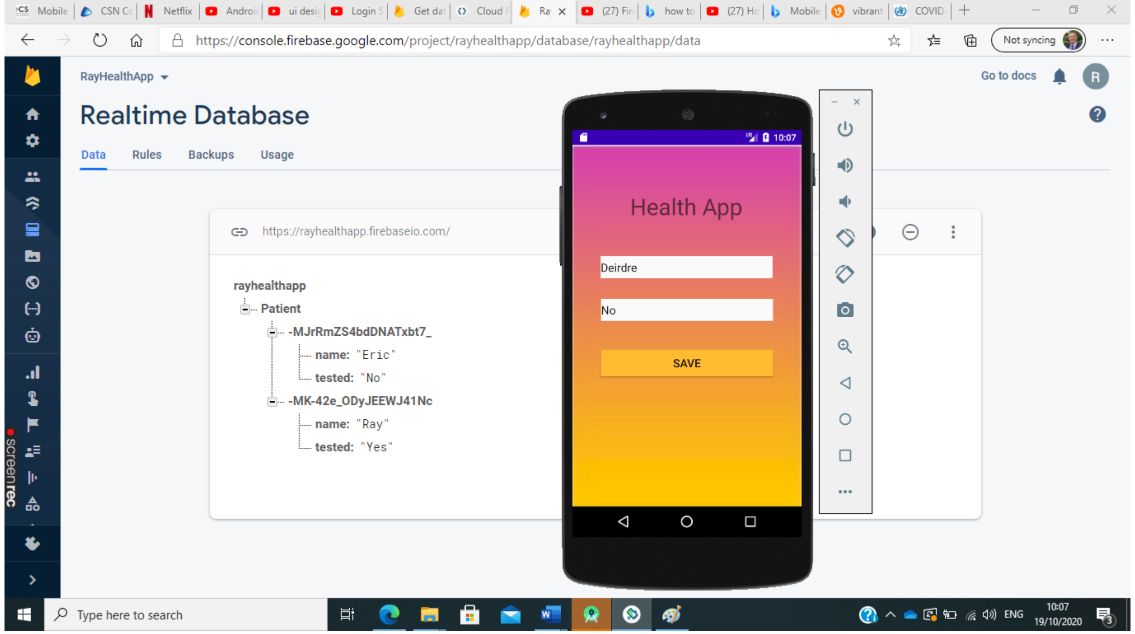
```
rayhealthapp
  Patient
    -MJrRmZS4bdDNATxbt7_
      name: "Eric"
      tested: "No"
```

Health App

Ray

Yes

	When the Save button is clicked your data is stored in realtime in the Firebase database as shown below.  RayHealthApp Realtime Database Data Rules Backups Usage Go to docs RayHealthAppNew Health App Enter name please Enter Yes or No re Tested SAVE Type here to search https://console.firebase.google.com/project/rayhealthapp/database/rayhealthapp/data https://rayhealthapp.firebaseio.com/ rayhealthapp Patient -MJrRmZS4bdDNATxbt7_ name: "Eric" tested: "No" -MK-42e_ODyJEEWJ41Nc name: "Ray" tested: "Yes"



https://console.firebase.google.com/project/rayhealthapp/database/rayhealthapp/data

RayHealthApp

Realtime Database

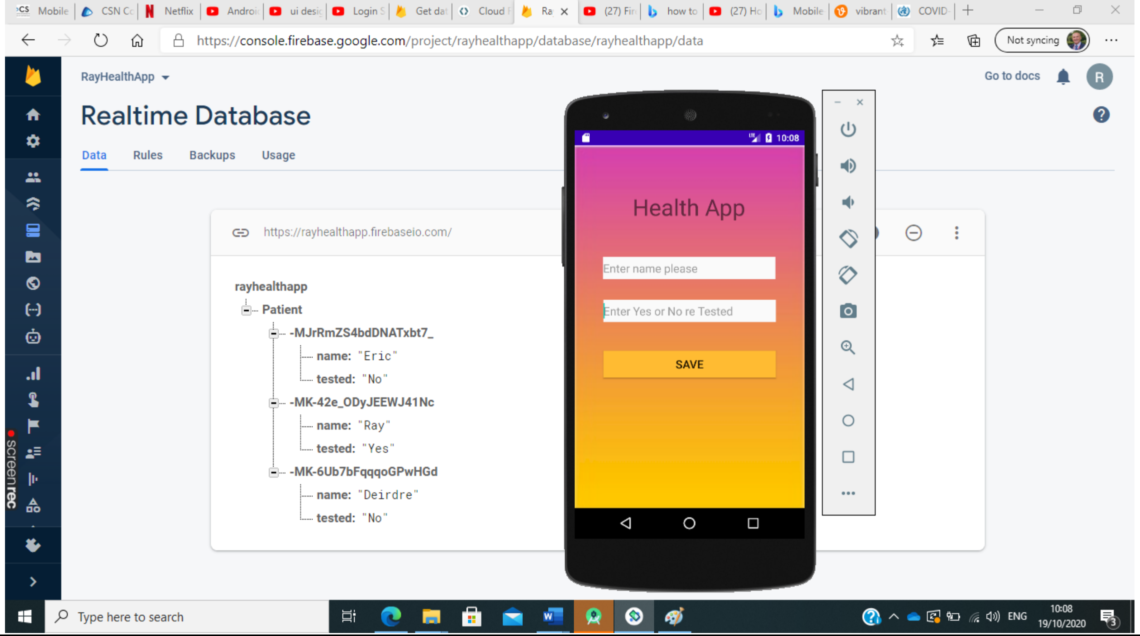
https://rayhealthapp.firebaseio.com/

```
rayhealthapp
└─ Patient
   ├─ -MJrRmZS4bdDNATxbt7_
   │   ├─ name: "Eric"
   │   └─ tested: "No"
   └─ -MK-42e_ODyJEEWJ41Nc
       ├─ name: "Ray"
       └─ tested: "Yes"
```

Health App

Deirdre

No



https://console.firebase.google.com/project/rayhealthapp/database/rayhealthapp/data

RayHealthApp

Realtime Database

https://rayhealthapp.firebaseio.com/

```
rayhealthapp
└─ Patient
   ├─ -MJrRmZS4bdDNATxbt7_
   │   ├─ name: "Eric"
   │   └─ tested: "No"
   ├─ -MK-42e_ODyJEEWJ41Nc
   │   ├─ name: "Ray"
   │   └─ tested: "Yes"
   └─ -MK-6Ub7bFqqqoGPwHGd
       ├─ name: "Deirdre"
       └─ tested: "No"
```

Health App

Enter name please

Enter Yes or No re Tested
