1. Create a new Android Studio project – Empty Activity, API 16 or greater.
2. Update build.gradle (Module:app)
    a. Add packaging options inside of android definition

```
android {
       packagingOptions {
           exclude 'META-INF/LICENSE'
           exclude 'META-INF/LICENSE-FIREBASE.txt'
           exclude 'META-INF/NOTICE'
       }
. . .
}
```

    b. Add new firebase dependencies to dependency definition

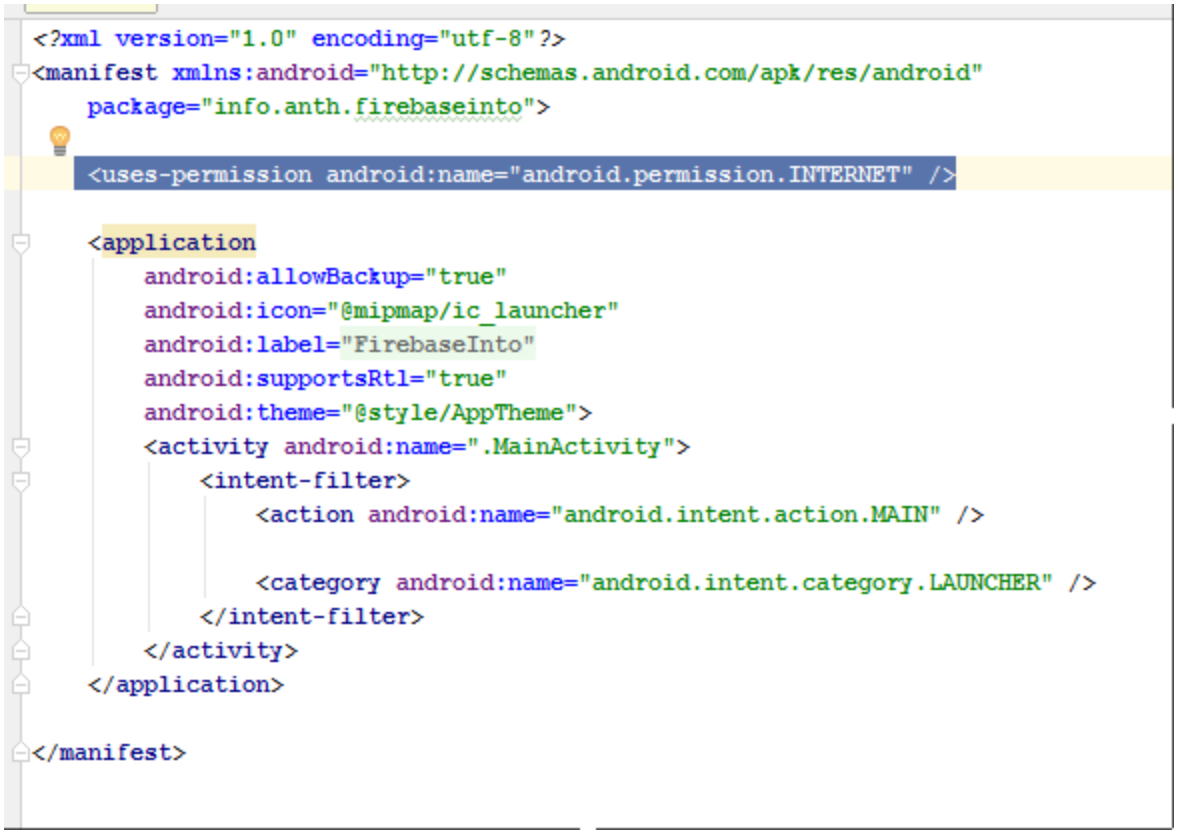
```
dependencies {
    . . .
    compile 'com.firebase:firebase-client-android:2.5.0'
    compile 'com.firebaseui:firebase-ui:0.3.1'
}
```

3. Press Sync now – verify no errors

```
apply plugin: 'com.android.application'

android {
    packagingOptions {
        exclude 'META-INF/LICENSE'
        exclude 'META-INF/LICENSE-FIREBASE.txt'
        exclude 'META-INF/NOTICE'
    }

    compileSdkVersion 23
    buildToolsVersion "23.0.2"

    defaultConfig {
        applicationId "info.anth.firebaseinto"
        minSdkVersion 16
        targetSdkVersion 23
        versionCode 1
        versionName "1.0"
    }
    buildTypes {
        release {
            minifyEnabled false
            proguardFiles getDefaultProguardFile('proguard-android.txt'), 'proguard-rules.pro'
        }
    }
}

dependencies {
    compile fileTree(dir: 'libs', include: ['*.jar'])
    testCompile 'junit:junit:4.12'
    compile 'com.android.support:appcompat-v7:23.2.0'
    compile 'com.firebase:firebase-client-android:2.5.0'
    compile 'com.firebaseui:firebase-ui:0.3.1'
}
```

4. Update AndroidManifest.xml file – add user permissions to the internet

```
<uses-permission android:name="android.permission.INTERNET" />
```



```
<?xml version="1.0" encoding="utf-8"?>
<manifest xmlns:android="http://schemas.android.com/apk/res/android"
    package="info.anth.firebaseinto">

    <uses-permission android:name="android.permission.INTERNET" />

    <application
        android:allowBackup="true"
        android:icon="@mipmap/ic_launcher"
        android:label="FirebaseInto"
        android:supportsRtl="true"
        android:theme="@style/AppTheme">
        <activity android:name=".MainActivity">
            <intent-filter>
                <action android:name="android.intent.action.MAIN" />

                <category android:name="android.intent.category.LAUNCHER" />
            </intent-filter>
        </activity>
    </application>

</manifest>
```

5. Update MainActivity.java – Firebase Android Context code, if it doesn't include the import firebase code add that as well

```
Firebase.setAndroidContext(this);
```

(maybe)

```
import com.firebase.client.Firebase;
```

```
package info.anth.firebaseinto;

import android.support.v7.app.AppCompatActivity;
import android.os.Bundle;

import com.firebase.client.Firebase;

public class MainActivity extends AppCompatActivity {

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

        Firebase.setAndroidContext(this);
    }
}
```

6. Run the app to verify no errors

7. Create Firebase Account at firebase.com
8. Create global reference (mRef) to your Firebase database
    a. Add variable: Firebase mRef;
    b. Add assignment to your database inside onCreate method: REPLACE hudsonvalleygdg with the name of your database.

```
mRef = new Firebase("https://hudsonvalleygdg.firebaseio.com");
```

```
package info.anth.firebaseinto;

import android.support.v7.app.AppCompatActivity;
import android.os.Bundle;

import com.firebase.client.Firebase;

public class MainActivity extends AppCompatActivity {

    Firebase mRef;

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

        Firebase.setAndroidContext(this);

        mRef = new Firebase("https://hudsonvalleygdg.firebaseio.com");

    }
}
```

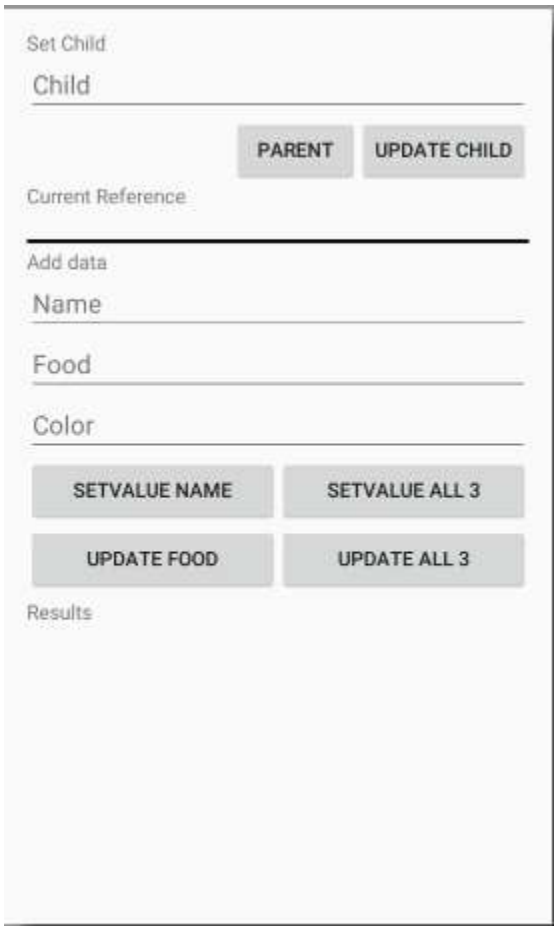
9. Replace activity_main.xml code:

```
<?xml version="1.0" encoding="utf-8"?>
<ScrollView xmlns:android="http://schemas.android.com/apk/res/android"
    android:layout_width="match_parent"
    android:layout_height="match_parent">

    <RelativeLayout
        android:id="@+id/main_relative_layout"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:paddingBottom="@dimen/activity_vertical_margin"
        android:paddingLeft="@dimen/activity_horizontal_margin"
        android:paddingRight="@dimen/activity_horizontal_margin"
        android:paddingTop="@dimen/activity_vertical_margin">

        <TextView
            android:id="@+id/heading_text"
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:text="Set Child" />

        <EditText
            android:id="@+id/edit_child"
            android:layout_width="match_parent"
            android:layout_height="wrap_content"
            android:layout_below="@id/heading_text"
            android:hint="Child" />

        <Button
            android:id="@+id/button_child"
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:layout_alignEnd="@+id/edit_child"
            android:layout_alignRight="@+id/edit_child"
            android:layout_below="@+id/edit_child"
            android:text="Update Child"
            android:onClick="clickChild"/>

        <Button
            android:id="@+id/button_parent"
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:layout_below="@+id/edit_child"
            android:layout_toLeftOf="@+id/button_child"
            android:layout_toStartOf="@+id/button_child"
            android:text="Parent"
            android:onClick="clickParent"/>

        <TextView
            android:id="@+id/heading_ref"
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:layout_below="@+id/button_child"
            android:text="Current Reference" />

        <TextView
            android:id="@+id/text_reference"
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:layout_below="@+id/heading_ref"
            />
```

```
<TextView
    android:id="@+id/line1"
    android:layout_width="match_parent"
    android:layout_height="3dp"
    android:layout_below="@+id/text_reference"
    android:layout_marginBottom="5dp"
    android:layout_marginTop="5dp"
    android:background="#111111" />

<TextView
    android:id="@+id/heading_add"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_below="@+id/line1"
    android:text="Add data" />

<EditText
    android:id="@+id/edit_name"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:layout_below="@id/heading_add"
    android:hint="Name" />

<EditText
    android:id="@+id/edit_food"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:layout_below="@id/edit_name"
    android:hint="Food" />

<EditText
    android:id="@+id/edit_color"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:layout_below="@id/edit_food"
    android:hint="Color" />

<LinearLayout
    android:id="@+id/layout_set"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:layout_below="@+id/edit_color"
    android:orientation="horizontal">

    <Button
        android:id="@+id/button_set"
        android:layout_width="0dp"
        android:layout_height="wrap_content"
        android:layout_weight="1"
        android:text="setValue name"
        android:onClick="clickSetName"/>

    <Button
        android:id="@+id/button_set3"
        android:layout_width="0dp"
        android:layout_height="wrap_content"
        android:layout_weight="1"
        android:text="setvalue all 3"
        android:onClick="clickSet3"/>
</LinearLayout>

<LinearLayout
    android:id="@+id/layout_update"
```

```
            android:layout_width="match_parent"
            android:layout_height="wrap_content"
            android:layout_below="@+id/layout_set"
            android:orientation="horizontal">

            <Button
                android:id="@+id/button_update"
                android:layout_width="0dp"
                android:layout_height="wrap_content"
                android:layout_weight="1"
                android:text="update food"
                android:onClick="clickUpdateFood"/>

            <Button
                android:id="@+id/button_update3"
                android:layout_width="0dp"
                android:layout_height="wrap_content"
                android:layout_weight="1"
                android:text="update all 3"
                android:onClick="clickUpdate3"/>
        </LinearLayout>

        <TextView
            android:id="@+id/heading_results"
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:layout_below="@+id/layout_update"
            android:layout_marginBottom="5dp"
            android:layout_marginTop="5dp"
            android:text="Results" />
        <TextView
            android:id="@+id/text_results"
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:layout_below="@+id/heading_results"
            />
    </RelativeLayout>
</ScrollView>
```

Should look like:



11. Add empty button methods to the MainActivity class.

```
public class MainActivity extends AppCompatActivity {

  . . .

    public void clickChild(View view){
    }

    public void clickParent(View view){
    }

    public void clickSetName(View view){
    }

    public void clickSet3(View view){
    }

    public void clickUpdateFood(View view){
    }

    public void clickUpdate3(View view){
    }
}
```

12. Update the click child method. This method allows you to subsets of data, children, in your database. It uses the Firebase function reference.child("<child-name>") to update the reference. Until a value is added to the path, you will not see anything change in the database. It also uses the Firebase function reference.getRef() to show the current reference.

```
public void clickChild(View view){
    // This method moves along the children of the database
    // Each call will add a new child to the path
    //
    // In file systems terms: creating a sub-directory

    // Get the Edit Text
    EditText childEntry = (EditText) findViewById(R.id.edit_child);
    // Get reference display text field
    TextView displayRef = (TextView) findViewById(R.id.text_reference);

    // update the Firebase reference (if child has a value)
    mRef = mRef.child(childEntry.getText().toString());
    // set reference display text
    displayRef.setText(mRef.getRef().toString());

    // clear Child edit box
    childEntry.setText("");
}
```

13. Update the click parent method. This method moves your reference to the parent of your current reference. Stopping at the root. It uses the reference.getParent() Firebase method, and the reference.getRef() method for display. It checks to see if it is already at the root using reference.getRoot() and reference.getRef(). Nothing will be displayed in the Firebase database.

```
public void clickParent(View view){
    // This method moves to the parent of the current reference

    // Get reference display text field
```

```
    TextView displayRef = (TextView) findViewById(R.id.text_reference);

    // Need to check if already at root.
    if (!mRef.getRef().toString().equals(mRef.getRoot().toString())) {
        // NOT at root
        // update the Firebase reference (if child has a value)
        mRef = mRef.getParent();
    }
    // set reference display text
    displayRef.setText(mRef.getRef().toString());
}
```

14. Run Program
15. Update the clickSetName and clickSet3 methods with the code below. This code navigates to the child and sets its value. Beware: the setValue method deletes all child nodes at its calling reference and inserts the new values. Navigating to the direct child avoids this issue.

```
public void clickSetName(View view){
    // This method saves the data for the name using the set method

    // Get the Name entry
    EditText nameEntry =  (EditText) findViewById(R.id.edit_name);

    // Navigate to the name child and set the value
    mRef.child("name").setValue(nameEntry.getText().toString());
}

public void clickSet3(View view){
    // This method saves the data for name, food, and color using the set
method

    // Get the Name entry
    EditText nameEntry =  (EditText) findViewById(R.id.edit_name);
    // Get the Food entry
    EditText foodEntry =  (EditText) findViewById(R.id.edit_food);
    // Get the Name entry
    EditText colorEntry =  (EditText) findViewById(R.id.edit_color);

    // Navigate to the name child and set the value
    mRef.child("name").setValue(nameEntry.getText().toString());
    // Navigate to the food child and set the value
    mRef.child("food").setValue(foodEntry.getText().toString());
    // Navigate to the color child and set the value
    mRef.child("color").setValue(colorEntry.getText().toString());
}
```

16. Run the program. Changes will save to the database. Use the Firebase dashboard to see the changes. https://YOUR-DATABASE-NAME.firebaseio.com/
17. Replace the clickSetName and clickSet3 methods with the code below. This code uses Hash Maps to set key, value pairs. Beware: the setValue method deletes all child nodes at its calling reference and inserts the new values. Navigating to the direct child avoided this issue, using hash maps does not.

```
public void clickSetName(View view){
    // This method saves the data for the name using the set method

    // Get the Name entry
```

```
    EditText nameEntry =  (EditText) findViewById(R.id.edit_name);

    // Define hash map and set the values
    Map<String, Object> updateMap = new HashMap<>();
    updateMap.put("name", nameEntry.getText().toString());
    mRef.setValue(updateMap);
}

public void clickSet3(View view){
    // This method saves the data for name, food, and color using the set
method

    // Get the Name entry
    EditText nameEntry =  (EditText) findViewById(R.id.edit_name);
    // Get the Food entry
    EditText foodEntry =  (EditText) findViewById(R.id.edit_food);
    // Get the Name entry
    EditText colorEntry =  (EditText) findViewById(R.id.edit_color);

    // Define hash map and set the values
    Map<String, Object> updateMap = new HashMap<>();
    updateMap.put("name", nameEntry.getText().toString());
    updateMap.put("color", colorEntry.getText().toString());
    updateMap.put("food", foodEntry.getText().toString());
    mRef.setValue(updateMap);
}
```

18. Run the program. Changes will save to the database. Use the Firebase dashboard to see the changes. https://YOUR-DATABASE-NAME.firebaseio.com/ Notice that clicking the SETVALUE NAME button after the SETVALUE ALL 3 will delete the color and food children. This is because the setValue() Firebase function deletes all children at the reference it is executed and then inserts the new values.
19. Update the clickUpdateFood and clickUpdate3 methods with the code below. This code uses hash Maps to update the child key with its value.

```
public void clickUpdateFood(View view){
    // This method saves the data for food using the updateChildren method

    // Get the Food entry
    EditText foodEntry =  (EditText) findViewById(R.id.edit_food);

    // Define hash map and set the values
    Map<String, Object> updateMap = new HashMap<>();
    updateMap.put("food", foodEntry.getText().toString());
    mRef.updateChildren(updateMap);
}

public void clickUpdate3(View view){
    // This method saves the data for name, food, and color
    // using the updateChildren method

    // Get the Name entry
    EditText nameEntry =  (EditText) findViewById(R.id.edit_name);
    // Get the Food entry
    EditText foodEntry =  (EditText) findViewById(R.id.edit_food);
    // Get the Name entry
    EditText colorEntry =  (EditText) findViewById(R.id.edit_color);

    // Define hash map and set the values
    Map<String, Object> updateMap = new HashMap<>();
```

```
    updateMap.put("name", nameEntry.getText().toString());
    updateMap.put("color", colorEntry.getText().toString());
    updateMap.put("food", foodEntry.getText().toString());
    mRef.updateChildren(updateMap);
}
```

20. Run the program. Changes will save to the database. Use the Firebase dashboard to see the changes. https://YOUR-DATABASE-NAME.firebaseio.com/
21. Setup a listener at the base reference level of the database. Show in the results section of screen. (Add highlighted lines)
    a. Add variables, store results TextView

```
Firebase mRefRoot;
ValueEventListener eventListener;
TextView resultsText;

@Override
protected void onCreate(Bundle savedInstanceState) {

    . . .

    mRefRoot = mRef;
    resultsText = (TextView) findViewById(R.id.text_results);
}
```

    b. Override onResume and onPause methods

```
@Override
public void onResume() {
    super.onResume();
    eventListener = new ValueEventListener() {
        @Override
        public void onDataChange(DataSnapshot dataSnapshot) {
            Log.i("FirebaseInto", String.valueOf(dataSnapshot.getValue()));
            resultsText.setText(String.valueOf(dataSnapshot.getValue()));
        }
        @Override
        public void onCancelled(FirebaseError firebaseError) {
            Log.e("FirebaseInto", firebaseError.toString());
        }
    };
    mRefRoot.addValueEventListener(eventListener);
}

@Override
public void onPause() {
    super.onPause();
    mRefRoot.removeEventListener(eventListener);
}
```

22. Run the program. All database values should show in the results area. Changes directly made using the Firebase dashboard will also show: https://YOUR-DATABASE-NAME.firebaseio.com/