



Radix Calculator and Converter

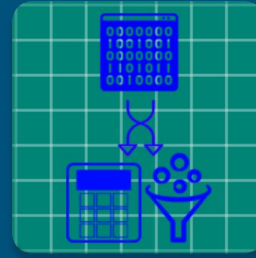


Android Studio Project by Aseel
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Overview



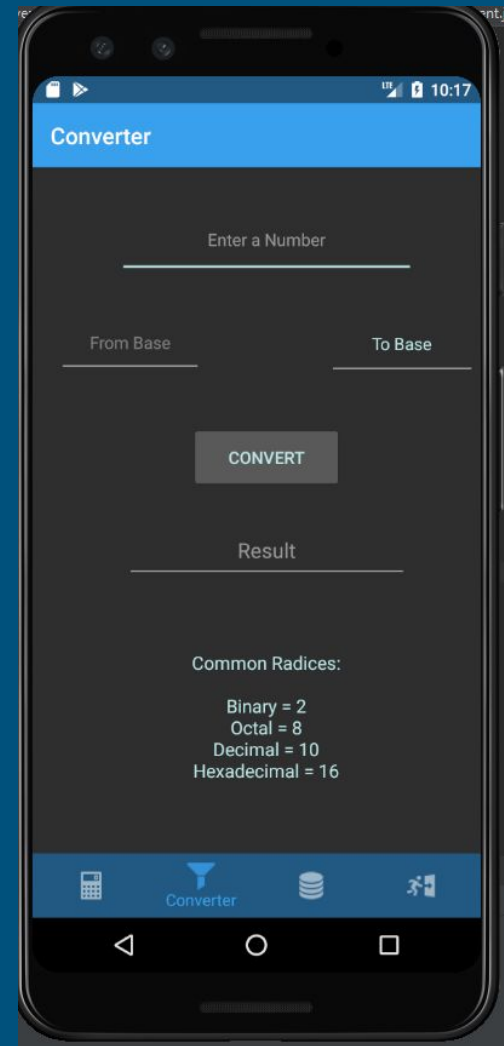
- As required, our project was implemented using Android Studio and the Java programming language
- The project allows the user to convert and calculate between radices 1-10 as well as 16 (Hex), supporting whole integers (positive or negative)
- The project uses an authentication system using Firebase for login
- We implemented a database using SQLite that stores each conversion/calculation. The user can also clear the database.
- The user is able to navigate the application using a bottom navigation bar

Implementation of Base Conversion

- We implemented a Radix converter that allows us to perform the operations we need
- This was implemented as a separate class called RadixConverter, which contained various methods
- The main method within RadixConverter takes in three parameters: a number, original base, and base to be converted to
- The method then calls two helper methods; first the number is converted to Decimal regardless of the original base
- The number (in decimal) is then converted to the desired base and returned as a String

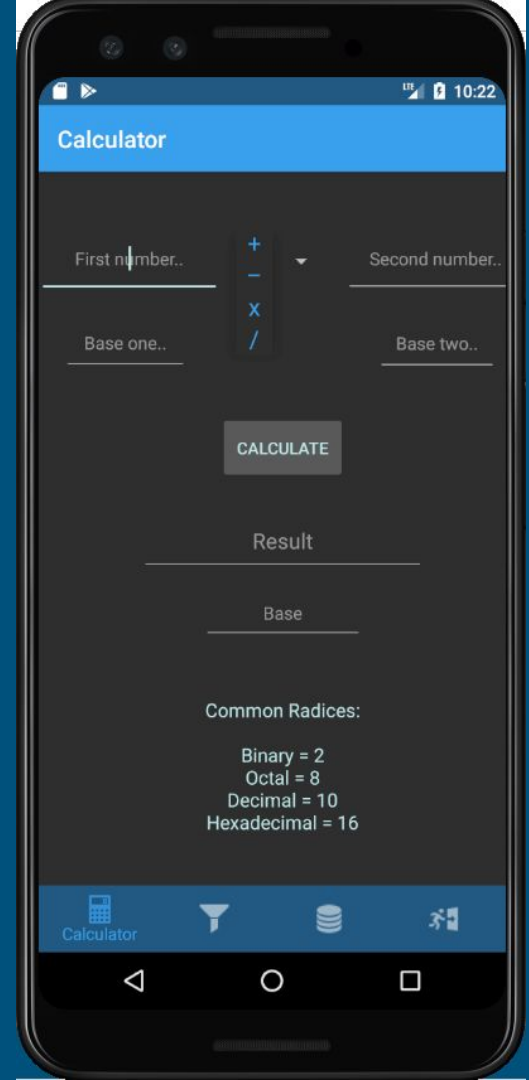
Layout of Application

- Our application is easily navigated with a bottom navigation bar
- There are tabs for the Calculator, Converter, Database, and to Sign Out
- Each tab has a helpful icon, and text when selected



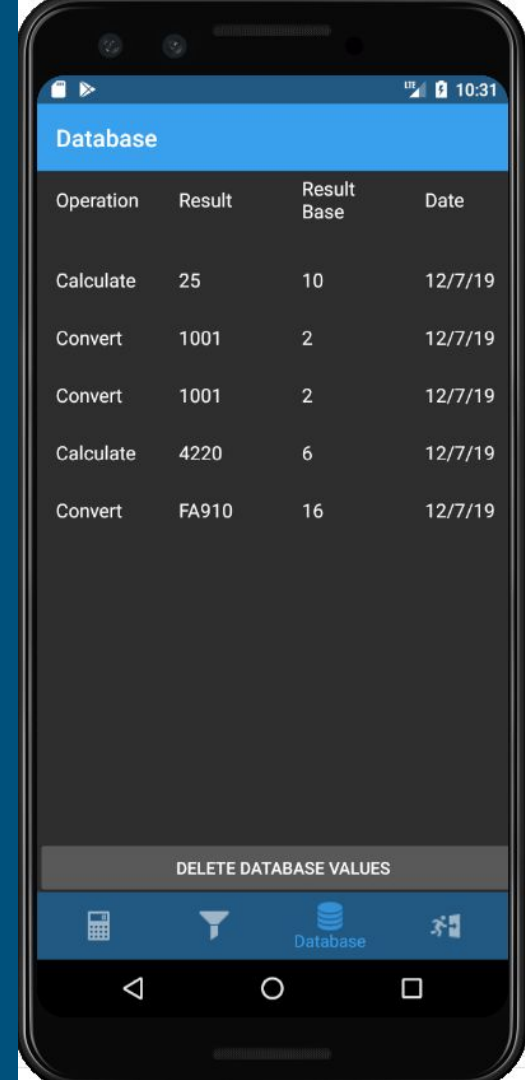
Calculator and Converter Pages

- The calculator and converter pages are intuitive and easy to use
- We went with a minimalist look that contains just the input/output boxes needed, as well as reminders for common number bases at the bottom of each page
- The calculator page uses a “spinner” to change between different operands



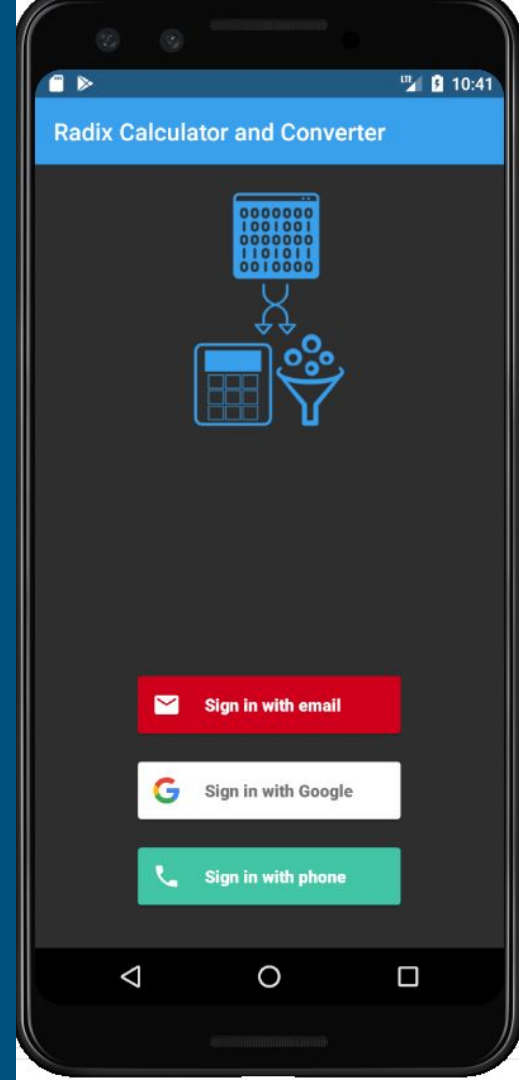
Database Page

- After each operation, data is written to a database (Type of operation, the result, the base of the result, and the date)
- When the database page/fragment is clicked on, a SELECT is performed to retrieve all the data from the database
- The data is then populated in a GridView containing columns for each item, which is scrollable
- We also included a “Delete Database Values” button that clears the database



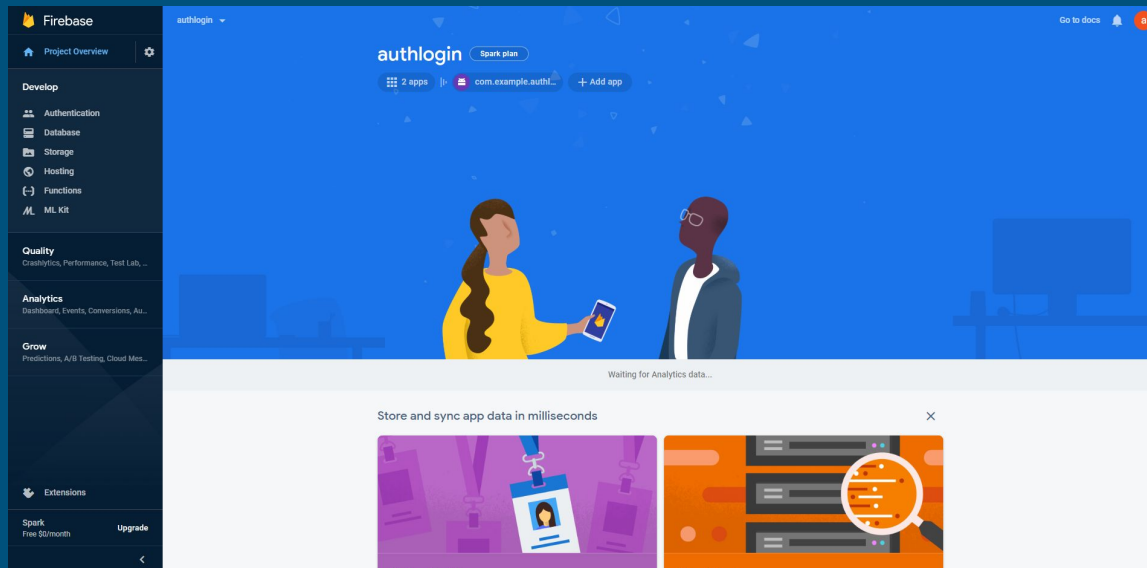
Firestore Authentication

- Our application uses an authentication system which we implemented using Firestore
- Each user must login using either Email, Google Account, or Phone Number
- The authentication page is built within MainActivity, and switches to the bottom navigation activity when successfully logged in
- The user can sign out using the rightmost bottom navigation tab



Firebase Authentication cont.

- The project can be viewed on the Firebase website, and includes which types of authentication are enabled along with all of the registered users



Firebase Authentication cont.

Phone Method

Phone

☒ Enable

Phone Authentication requires additional configuration steps. Follow the steps for your platform.

[iOS](#) [Android](#) [Web](#)

Allow users to sign in with a mobile phone number, using Firebase SDK phone verification and user authentication tools. [Learn more](#)

Phone numbers for testing (optional) ⓘ




Phone number Verification code

+1 650-555-1234 123456 [Add](#)



+1 508-304-2171 123456

[Cancel](#) [Save](#)

Three Authentication Options

 Email/Password	Enabled
 Phone	Enabled
 Google	Enabled

Accounts example

Identifier	Providers	Created	Signed In	User UID ↑
app1000000001@gmail.com		Dec 5, 2019	Dec 6, 2019	3D9wDczeHzgGHMaESWDBJ1TK...
ryanjohnson0430@gmail.com		Nov 26, 2019	Dec 7, 2019	zs6StEsuLIW4trcZjhWrKQitF93

Summary

Technologies/Applications we gained experience in:

- SQLite / Database queries
- Firebase authentication
- Android studio
- UI Design
- Java programming language

Improvements that we could make...

- Search for database values
- Steps to each solution, either on a separate page or at the bottom of the page
- Supporting floating point numbers

References and Helpful Videos

Database Implementation:

- SQLite Database to ListView - Part 3: View Data - Android Studio Tutorial
 - <https://www.youtube.com/watch?v=N-gHIJShz1I>
- SQLite Guide from Dr. Nourai (posted on Blackboard)

Firestore Implementation:

- Android Studio Tutorial - Firestore Authentication (2019 Version)
 - https://www.youtube.com/watch?v=EO-_vwfVi7c

Spinner Usage:

- Spinners | Android Developers
 - <https://developer.android.com/guide/topics/ui/controls/spinner>