TRIGONOMANIA: Capstone Proposal

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Trigonomania

Description

Trigonomania is an app to make trigonometry easy by calculating all the trigonometric functions with an input of an angle. Trigonomania can also calculate trigonometric functions given any two sides.

Intended User

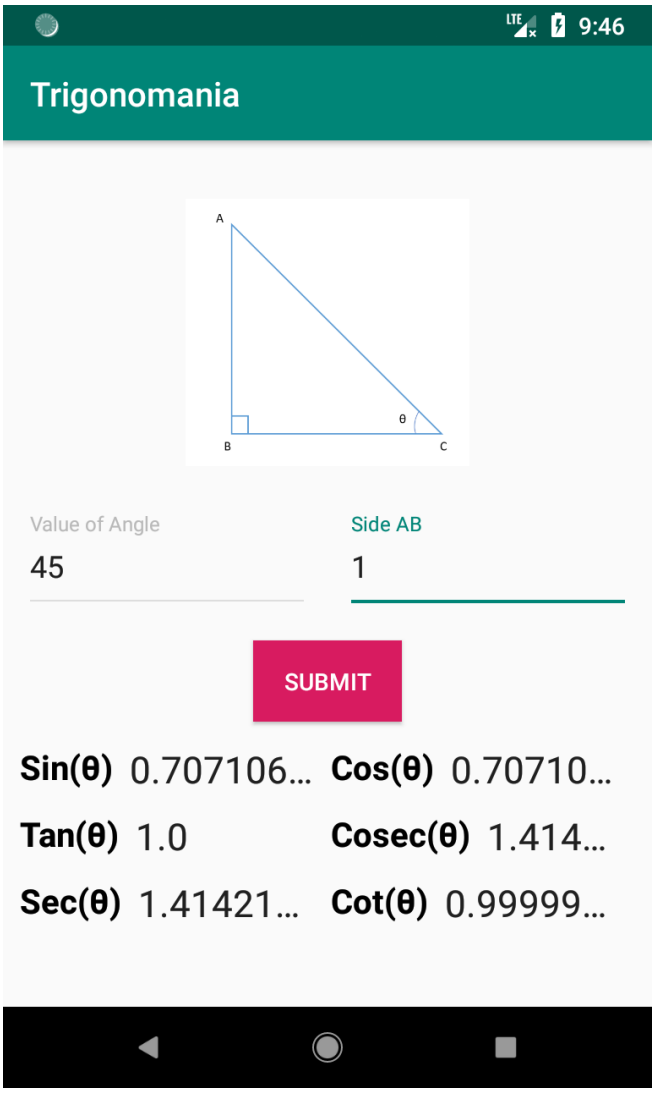
This app targets students of Mathematics and Physics. Trigonometry is so useful branch of Mathematics which has applications even in Physics. This app will reduce the calculations for the users by 80%.

Features

- Calculate trigonometric functions by a given angle
- Calculate trigonometric functions by given two sides
- Stores recent calculations in database
- Widget to pin down most recent calculation

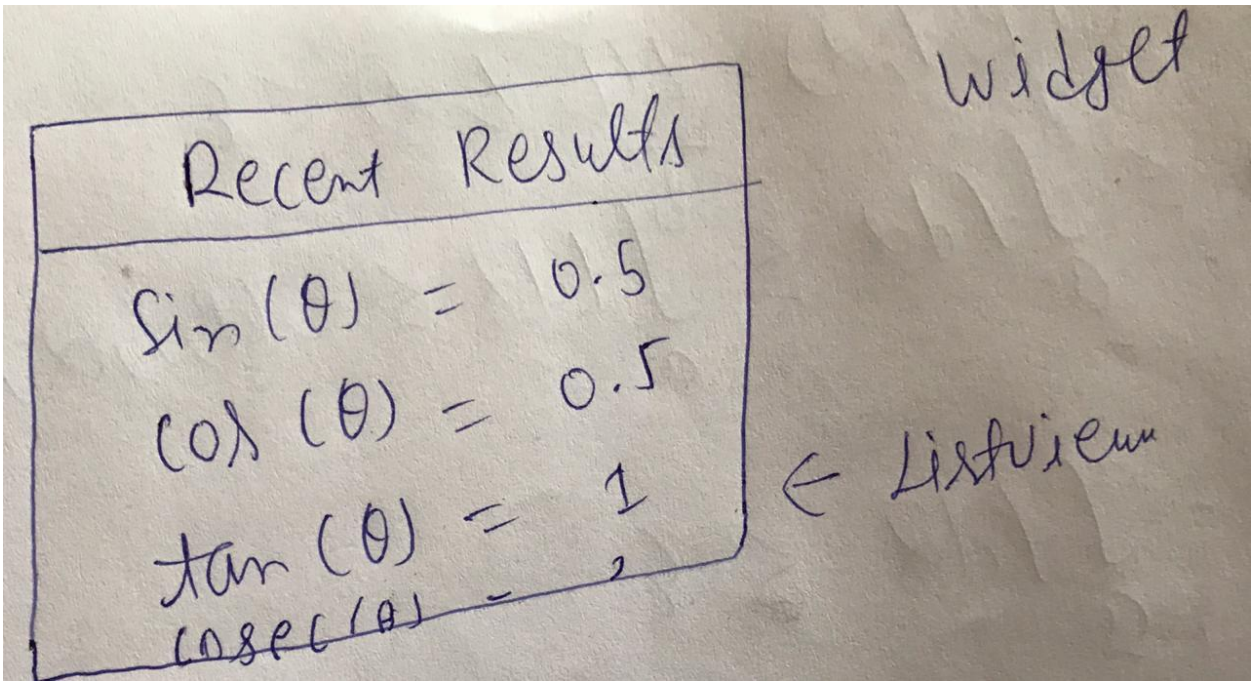
User Interface Mocks

Screen 1



(This is a mockup for the main screen. As of now it asks for value of angle as well as side but for the final product, one of them is going to be optional.)

Widget 1



(The widget will have a ListView consisting of the trigonometric values from most recent calculation)

Key Considerations

In which language is this app going to be written?

Trigonomania is going to be completely written in Java.

Shall this app use only stable versions of Android Studio, Gradle and dependencies or alpha/beta versions as well?

Trigonomania will only use stable versions of Android Studio, Gradle and dependencies.

How will your app handle data persistence?

Trigonomania will use Room library for data persistance and the most recent calculations will be stored.

Describe any edge or corner cases in the UX.

The app will offer inputs according to user preference of whether he/she wants to calculate trigonometric functions by a given angle or two sides.

Describe any libraries you'll be using and share your reasoning for including them.

I will be using MaterialEditText which is an enhanced EditText, ButterKnife for binding views and architecture components for data persistence and lifecycle handling.

Describe how you will implement Google Play Services or other external services.

I will be using Analytics to determine whether user is preferring the value from given angle feature or two sides method. Crashlytics will be used to get stack traces of the crashes. I will be using AdMob as well to show banner ads to users.

How this app will handle accessibility?

For images, I will be using Content Descriptions. Navigation using D-Pad isn't required as I won't be targeting Android TV.

Stage 2 Requirements

- I will be using **strings.xml** file to store all the strings
- I will be supporting RTL Layout
- For loading data from database using Room, I will use **AsyncTask** so that all the operations are performed on a background thread. **IntentService** will be used to update the widget.
- I will be using Android Architecture Components in this project. I will be using **Room** for data persistence, **ViewModel** to survive configuration changes, **LiveData** for observing data changes and **Repository** pattern to extract network operations at one place.

Next Steps: Required Tasks

Following are the main tasks:

Task 1: Project Setup

- Clone and run the project
- Put your ADMOB id in *build.gradle*
- Create a new firebase project and connect it with the app
- That's it! Now you can test the app perfectly

Task 2: Implement UI for Each Activity and Fragment

- Build MainActivity UI
- Build separate tablet UI for the main activity
- Use Fragments for multi-pane UI

Task 3: Add Firebase Project

- Connect app with firebase
- Add Analytics integration to determine user's preference for two core features
- Add AdMob SDK and implement Banner Ad

Task 4: Explore Math Libraries

- Learn Math class in Java
- Explore 3rd-party libraries to facilitate calculations in terms of radians and degrees

Task 5: Implement Widget

- The app widget shows recent calculation
- App widget uses ListView to indicate different trigonometric values