Module 1: Critical Thinking Calculator

Platform-Based Development

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Option #2: "Calculator"

Challenge: Build a basic calculator application that allows users to perform addition, subtraction, multiplication, and division operations. Implement user input and output functionality to create a functional calculator using Kotlin.

Please ensure that your submission includes the following components:

Source code file(s) containing the program implementation.

A 1-page paper explaining the program's purpose, the obstacles faced during its development, and the skills acquired. The paper should also include screenshots showcasing the successful execution of the program.

Compile and submit your pseudocode, source code, and screenshots of the application executing the application, the results and GIT repository in a single document.

Solution:

I picked Calculator assignment because it was challenging to me. I had no idea what I will be doing and how I will be doing to develop a calculator. Below are worked I did to develop calculator:

1. Project Initialization: I created project called Calculator with empty view and all the default settings. Default settings gave me MainActivity.kt and activity\_main.xml.
2. UI Design: Because I am a visual person so I started working on UI. I changed the default layout to LinearLay which suits for this project. I created textview, and several buttons that are needed for calculator.
3. Properties on UI Element: Basic calculator has few functionality, hence I have fewer buttons. Numbers from 0 to 9, operators that includes +, -, \* and /. I also added functionality to clear the calculator and delete the last digit. I created functions for numbers, operators, clear and delete functionality. I also added a FAQ button to explain the functionality of this application.
4. Methods:
   1. onNumberButtonClick: This will be called when any number buttons are tapped.
   2. onOperatorButtonClick: When either of the operator button is tapped this button will either perform the operation and/or hold the tapped operation based on the current state.
   3. onEqualButtonClicked: It will simply calculate the current calculations based on two numbers and operators tapped
   4. onDeleteButtonClick: This will delete the last digit shown on the textView. This can be useful when user might have mistakenly entered extra number and they need to correct.
   5. onClearButtonClick: This will simply clear everything and so fresh start.
   6. onAboutButtonClicked: I added FAQ feature which can have multiple informative items to help user on how to use the calculator. Currently I am presenting buttom sheet screen and show some text.

Obstacles:

This is the first time I am working in any android application and there were tons of obstacles while creating the Calculator application. First thing was lack of knowledge on android development. Android Docs helped me a lot on learning and understanding Kotlin programming and creating interfaces. I did lots of hit-and-trial to create interface. Also to write logic for calculator it was difficult in first time. I initially started creating action for each button then realized that maybe I should have common action for common button types. All numbers will have one action, all operators will have one button and so on. It helped me to make smaller code base as well. I also has decimal button and it was difficult to implement. I realized that the requirement of this assignment was to only perform basic operations so I removed the decimal and this calculator only performs the integer operations.

Skills acquired: As a part of Android application development I learned basic Kotlin as this is my first time learning Kotlin programming language. I also learned basic UI design for android application. The basic UI design are done in XML and they are very easy to work with. Android also has Compose framework to create design programmatically. This is new way of creating interface which I believe I will learn later in future.

Source Code:

A screenshot of a cell phone

Description automatically generatedA screenshot of a cell phone

Description automatically generated

Fig1: Above figure shows screenshot of Calculator and FAQ. First image is result of 1 + 2 = which gave the result 3.

Conclusion:

Creating calculator app is a difficult task. It involved various logics and interface development. Creating calculator helped me to learn basic Kotlin programming language as well as basic interface development. I personally felt developing app is very fun and engaging.