Project 1 – Mortgage Calculator

Description

For this assignment, you will implement a single-activity Android application using a handful of basic controls. The goal of the assignment is to become familiar with the use of Android Studio, basic UI elements, and the Android documentation.

View Layout

The view will have the following elements:

Amount Borrowed

This will be a EditText into which the user will enter the amount to be borrowed as a floating-point value (e.g., “1000.00”).

Interest Rate

This will be a EditText ranging from 0.0 to 10.0, indicating the annual percentage rate of the interest. The initial value should be set to 5.0. The program should issue an error when rate is outside the allowed range.

Loan Term

This will be a RadioGroup with the choices 7, 15, and 30 representing the number of years of the loan.

Taxes and Insurance

This will be a CheckBox that allows the user to select whether taxes and insurance are to be included in the monthly payment. This is a single checkbox.

Calculate

This will be a Button that, when pressed, will calculate the user’s monthly payments based on the values entered.

Monthly Payment

This will be a TextView or disabled EditText that displays the monthly payment.

Calculation

For interest rates other than 0%, the monthly payment can be calculated as:

$$M = (P * (\frac{J}{1-(1+J)^{-N}})) + T$$

Where:

P = Principal (the amount borrowed)
J = Monthly interest in decimal form (annual interest rate / 1200)
N = Number of months of the loan
T = Monthly taxes and insurance, if selected (0.1% of the amount borrowed)

For interest rates of 0%, the monthly payment is simply:

$$M = (\frac{P}{N}) + T$$

Other Requirements

- The app shouldn't crash on user input errors, such as if no values are specified and the user clicks the Calculate button.
- App should check for invalid user input (e.g., negative loan amount, out-of-range interest rate)
- App should use Toast message to report any user input errors.
- App should use linear layouts and should avoid using fixed sized widget or layouts.
- App will be tested in both landscape mode and portrait mode and possibly with different screen sizes. Default screen size is assumed to be 5".

Scoring

Total points is 10 pt

- Functional and complete UI elements : 3pt
- Correct results & error handling: 3pt
- Landscape and portrait mode : 2pt
- Small screen (4") and large screen (7") : 2pt

Advice

The Java and Android SDK documentation is your friend. You will need it to determine how to:

- Create a String with the desired formatting
- Write a value to a label

- Read a value from a EditText
- Convert an String to a float
- Determine which radio of a radio group is selected
- Determine if a CheckBox is checked

Submission

- Make sure your project builds on the latest Android Studio and runs on emulator before submission
- Include a README.txt file at top level of project directory. List any special studio settings, project settings or demo/testing instructions if necessary. Teacher/grader will read this file first before building and testing your program.
- Rename your project directory as *lastname.firstname.pa1* (e.g., sun.jun.pa1) Recall that project directory can be located by switching to "Project" view in Android Studio.
- Zip the whole project directory as a ZIP file with naming as *lastname.firstname.pa1.zip*
    - *Note: Wrong file/directory name will deduct up to 1 point*
- Submit the zip file via Camino/Canvas