Mobile Application Development
SOFE 4640U

Assignment 1 - EMI Calculator

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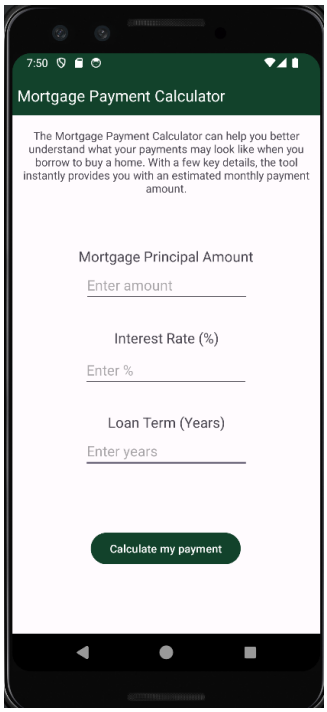
Assignment Task

The objective of this assignment is to create an android application called EMI calculator that would calculate a monthly payment for home mortgage given the principal amount, interest rate and loan term. This application was created with inspiration from the TD mortgage payment calculator website. To begin, I started off with an empty basic views template with a constraint view so I could add components anywhere I'd like, I chose this template since it gives me a clean fresh start on my project. Next, I implemented the toolbar of the application, at first I was having trouble changing the toolbar color to match the TD banks color scheme but eventually I got it to work by modifying the color hex value in the themes.xml file. I also added an application name header along with all the constraints to the sides of the screen so it can dynamically be viewed on other phone resolutions and displays. Next, I added a simple TextView with a description of what the application is intended to do, and of course, added constraints to the sides of the screen. In order to allow the users to enter information, I created 3 EditTexts for the loan amount, interest rate and loan term and calculate button that will take the inputted information. All constraints were made and the design of the app is ready to go(Appendix1.1). Finally, to make the application functional I began writing the code, I initiated all objects to be used such as the EditText fields, the calculate button and the variables to hold values. I created a setOnClickListener for the button and when this button is clicked, the values from the EditTexts will be converted and stored in a variable where it can be used for calculations(Appendix 1.2). A method called emi_calculator is used to calculate the monthly payment with the EMI formula (Appendix 1.3). The final amount will be returned to alertDialog box to the user which can be dismissed and the app can be used again (Appendix 1.4)..

Appendix

Appendix 1.1



Appendix 1.2

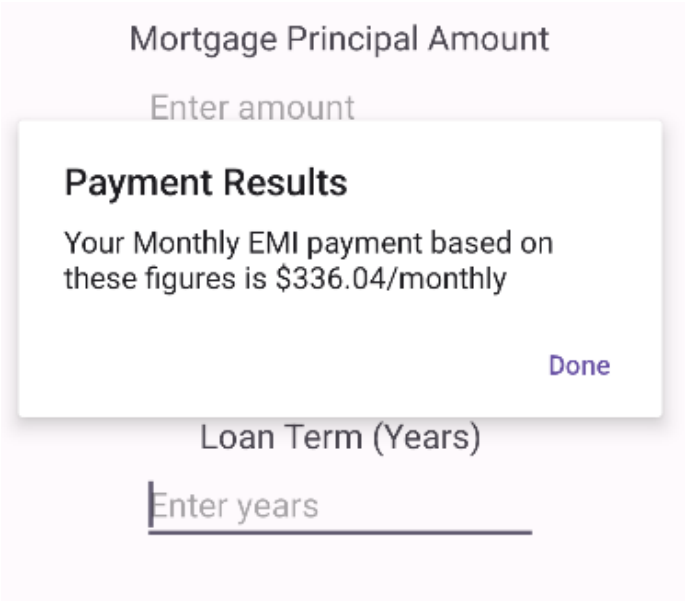
```
    calc = (Button) findViewById(R.id.calculate);
    principal = (EditText) findViewById(R.id.principal);
    interest = (EditText)findViewById(R.id.interest);
    years = (EditText)findViewById(R.id.years);
    calc.setOnClickListener(new View.OnClickListener() {
        @Override
        public void onClick(View view) {
            //Converts input from Edittext to a integer or double values and stored in their respective variables
            amount = Integer.valueOf(principal.getText().toString());
            percent = Double.parseDouble(interest.getText().toString());
            term = Integer.valueOf(years.getText().toString());
            AlertDialog.Builder builder = new AlertDialog.Builder( context: MainActivity.this);
            builder.setMessage("Your Monthly EMI payment based on these figures is $"+ String.format("%.2f", emi_calculator(amount, percent, term)) + "/monthly");
            builder.setTitle("Payment Results");
            builder.setPositiveButton( text: "Done", (DialogInterface.OnClickListener) (dialog, which) -> {
                // When the user click yes button then app will close
                dialog.dismiss();
            });
            // Create the Alert dialog
            AlertDialog alertDialog = builder.create();
            // Show the Alert Dialog box
            alertDialog.show();
            principal.setText("");
            interest.setText("");
            years.setText("");
        }
    });
}
static float emi_calculator(int p, double r, int t)
{
    float emi;

    r = r / (12 * 100); // one month interest
    t = t * 12; // one month period
    emi = (float) ((p * r * (float)Math.pow(1 + r, t)) / (float)(Math.pow(1 + r, t) - 1));

    return (emi);
}
```

Appendix 1.3

$$EMI = P \frac{r(1+r)^n}{(1+r)^n - 1}$$

r - Monthly interest rate
n - Number of Payments
P - Principal (the loan)

Appendix 1.4



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