To make a calculator in Java, I will need to create a graphical user interface (GUI) that allows the user to enter numbers and perform arithmetic operations. I will also need to create a logic class that handles the calculations and returns the results. Here is a possible project proposal for a Java calculator app:

* **Purpose of the app**: The purpose of this app is to create a simple and user-friendly calculator that can perform basic arithmetic operations such as addition, subtraction, multiplication, and division. The app will also have a clear button that resets the calculator, and a decimal button that allows the user to enter fractional numbers.
* **Classes I expect I will need for this app**: I will need at least three classes for this app: a **CalculatorGUI** class, a **CalculatorLogic** class, and a **Main** class.
  + The **CalculatorGUI** class will create and display the GUI components of the calculator, such as buttons, text fields, and labels. It will also handle the user input and output, and communicate with the **CalculatorLogic** class.
  + The **CalculatorLogic** class will perform the calculations based on the user input and the selected operation. It will also validate the input and handle any exceptions or errors that may occur.
  + The **Main** class will create an instance of the **CalculatorGUI** class and launch the app.
* **Relationship of these classes**: The **CalculatorGUI** class and the **CalculatorLogic** class will have a **composition** relationship, meaning that the **CalculatorGUI** class will have an instance variable of type **CalculatorLogic**. This way, the **CalculatorGUI** class can use the methods of the **CalculatorLogic** class to perform the calculations. The **Main** class will have an **association** relationship with the **CalculatorGUI** class, meaning that the **Main** class will create and use an object of type **CalculatorGUI**.
* **Fields these classes will contain**: The **CalculatorGUI** class will contain the following fields:
  + A **JFrame** object that represents the main window of the app.
  + A **JTextField** object that displays the user input and output.
  + A **JPanel** object that contains the buttons of the calculator.
  + A **JButton** array that stores the buttons of the calculator.
  + A **String** variable that stores the user input.
  + A **String** variable that stores the selected operation.
  + A **double** variable that stores the first operand.
  + A **double** variable that stores the second operand.
  + A **double** variable that stores the result.
  + A **CalculatorLogic** object that performs the calculations.

The **CalculatorLogic** class will contain the following fields: - A **double** variable that stores the first operand. - A **double** variable that stores the second operand. - A **double** variable that stores the result. - A **String** variable that stores the selected operation.

The **Main** class will not contain any fields, as it will only create and launch the app.