

Project Report: BMI Calculator Mobile Application

Unit: Mobile Applications Design and Development

Development Environment: Android Studio (Java)

1. Introduction

The objective of this project was to develop a mobile application that calculates the Body Mass Index (BMI) of a user based on their weight and height. The app serves as a health monitoring tool, providing immediate feedback on whether a user's BMI falls within a healthy range.

2. User Interface (UI) Design

The UI was designed using **XML (Extensible Markup Language)** with a focus on simplicity and user efficiency.

2.1 Layout Architecture

The app utilizes a **LinearLayout** with a vertical orientation. This choice ensures a linear flow of data entry, which is ideal for utility applications where the user follows a step-by-step process.

2.2 UI Components

- **EditText (Weight & Height):** Configured with `inputType="numberDecimal"`. This is a critical design choice that restricts user input to numbers and decimals, improving the overall User Experience (UX) by automatically launching the numeric keypad.
 - **Buttons (Compute & Reset):** Large, accessible buttons are used to trigger the logic or clear the state of the app.
 - **TextView (Result):** Positioned at the bottom to display the final calculation and health category.
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3. Application Logic and Implementation

The logic of the application is handled in **MainActivity.java**, which bridges the gap between the user interface and the mathematical calculations.

3.1 Event Handling

The app uses **OnItemClickListener**s for the buttons. When the "Compute" button is pressed, the app executes a multi-step logic flow:

1. **Capture:** It retrieves the string input from the `EditText` fields.
2. **Validation:** It checks if the fields are empty. If they are, it uses `setError()` to provide visual feedback directly on the input box—a standard Android design pattern.
3. **Error Handling:** A `try-catch` block is implemented to catch `NumberFormatException`. This prevents the app from crashing if a user enters invalid characters (like a single decimal point).

3.2 The Mathematical Algorithm

The core of the app is the BMI formula:

$$\text{BMI} = \frac{\text{weight(kg)}}{\text{height(m)}^2}$$

In Java, this is implemented as:

```
double bmi = weight / (height * height);
```

3.3 Classification Logic

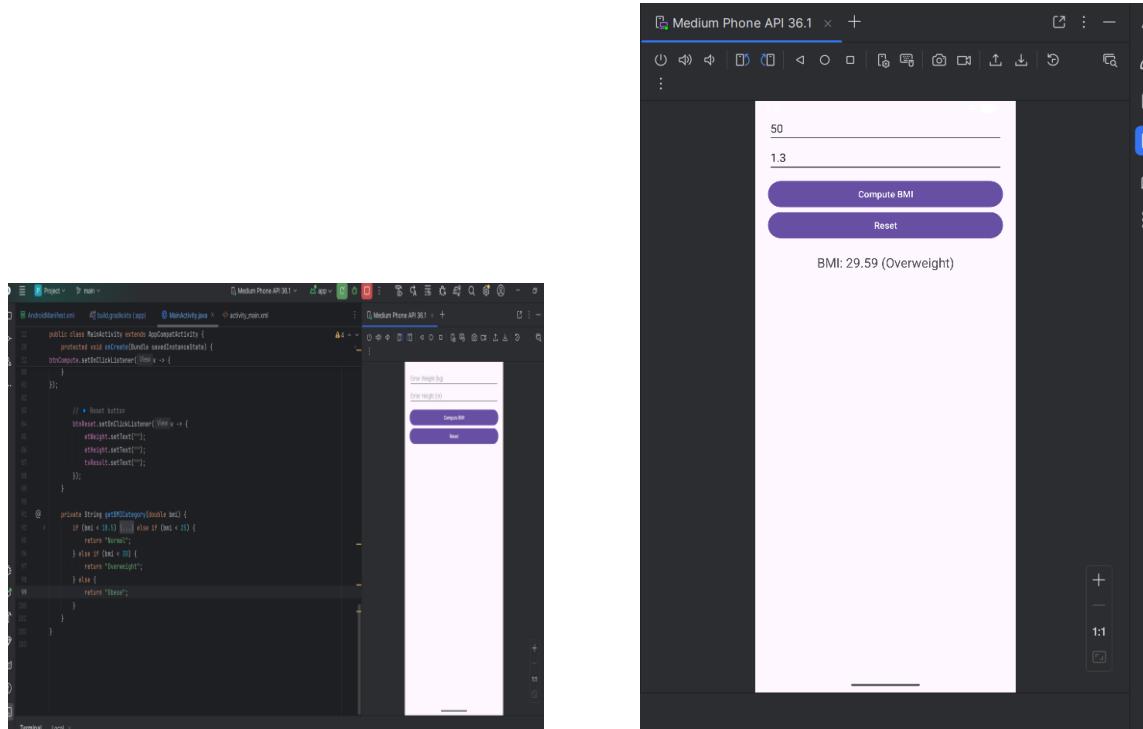
The app uses a private helper method, `getBMICategory()`, to interpret the numerical result based on World Health Organization (WHO) standards:

BMI Range	Category
< 18.5	Underweight
18.5 – 24.9	Normal
25.0 – 29.9	Overweight
> 30.0	Obese

4. Key Features & Functionality

- **Reset Functionality:** The `btnReset` listener clears all inputs and result text, allowing for a fresh calculation without manually deleting text.
 - **Input Focus:** The use of `requestFocus()` during validation ensures that the cursor automatically moves to the field that needs correction, streamlining the user interaction.
 - **Data Formatting:** The result is formatted to **two decimal places** using `String.format()`, ensuring the output is professional and readable.
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4. APP IN WORK:



6. Conclusion

The BMI Calculator successfully demonstrates the core principles of Android development: UI design via XML, event-driven programming in Java, and robust error handling. The app is not only functional but also resilient against common user input errors.