# KIRINYAGA UNIVERSITY

DEPARTMENT OF COMPUTER SCIENCE

COURSE: SPC 2207 – AUTOMATION PROJECT (CAT ONE)

PROJECT TITLE: Automation of Number System Conversions

## GROUP MEMBERS

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# PROCESS DOCUMENTATION

## 1. Objective

The objective of this project is to develop a mobile application that automates number system conversions. The app enables users to input a number in one number system (Binary, Octal, Decimal, or Hexadecimal) and automatically converts it to all other number systems.

## 2. Tools and Technologies Used

* Flutter SDK and Dart Programming Language-because it provides a modern powerful framework for building mobile applications
* Visual studio code -- we used avisual studio code for developing the Number System Converter App because it provides a complete powerful platform for Flutter Development.
* GitHub for collaboration and version control
* Emulator and real Android device for testing
* Html --for webpage structure

## 3. Development Process

1. Requirements gathering and UI design planning.
2. Designing the layout using Flutter widgets such as Card, DropdownButton, and TextField.
3. Implementing conversion logic and validation functions.
4. Testing and debugging using Flutter Hot Reload.
5. Deployment using ‘flutter build apk --release’ command.

## 4. Expected Output

The app takes a user input number in any of the four systems and converts it to the other three instantly. Each result can be copied directly from the interface for easy use.

## 5. Challenges Faced

Some challenges we noticed included validating number inputs for different bases, ensuring smooth performance, and making the layout responsive for multiple screen sizes.

## 6. Conclusion

The Number System Converter app demonstrates automation in computation by providing a fast, accurate, and interactive way to convert numbers between Binary, Octal, Decimal, and Hexadecimal.

# PROGRAM DOCUMENTATION

## 1. Overview

The app consists of a single Flutter screen that allows users to input a number, select its base system, and view automatic conversions to all other bases.

## 2. Key Components

* \_parseToDecimal(): Converts the input number to decimal for uniform calculations.
* \_convertNumber(): Performs conversions and updates all result fields.
* \_buildResultCard(): Displays formatted result cards with icons and copy options.
* \_clearResults() and \_clearInput(): Reset input and results on user request.

## 3. User Interface

The user interface was created using Flutter widgets for clarity and responsiveness. It includes a dropdown menu to select the number system, an input field for typing the number, and result cards showing conversions for Binary, Octal, Decimal, and Hexadecimal.

## 5.Deployment Platform

We deployed the Number System Converter app on Android devices using the Flutter SDK through Android Studio.

Flutter compiles the Dart code into native ARM code, producing an APK (Android Package) file that can be installed and run on any Android smartphone.

We successfully deployed using the Flutter build command:  
flutter build apk --release  
  
This generated an APK file located at: build/app/outputs/flutter-apk/app-release.apk.