Lab 4: Flutter Fundamentals - UI Design

Lab Overview

In this lab, you'll create your first Flutter application and learn about Flutter's core widgets, rendering model, and hot reload. You'll build a Tip Calculator and a **CampusHub app** that showcases a tutor's profile with comprehensive details. This lab focuses on understanding Flutter widgets, layouts, and styling.

Lab Objectives

By the end of this lab, you should be able to:

- Create and run your first Flutter application
- Understand Flutter's widget tree and rendering model
- Use core Flutter widgets: Text, Icon, Image, Container, Card
- Implement layout widgets: Column, Row, Stack, Expanded, Padding
- Style widgets with colors, typography, and Material Design
- Load and display images from assets and network
- Utilize hot reload for rapid UI development
- Build responsive layouts that adapt to different screen sizes

Part A: Tip Calculator (Guided Tutorial)

1) Create a New Flutter Project
2) Open your terminal or command prompt.
3) Run the command to create a new Flutter project named tip_app
    - `flutter create tip_app .`
4) Alternatively, you can use the IDE to create the project by using the following steps I. Open VS Code.
    - Press **Ctrl + Shift + P** (or **Cmd + Shift + P** on Mac) to open the command palette.
    - In the command palette, type **Flutter: New Project** and select it.
    - Choose Flutter Application and the location where you want to save your project.
    - Enter a name for your project (e.g., tip_app), and press Enter.

5) **Open the Project**
6) Navigate to the project directory and open it in your preferred IDE (e.g., VS Code, Android Studio).
7) **Run the app**
    - Ensure you have an emulator or a physical device connected.
    - Run the app to verify that everything is set up correctly.
8) **Explore the Project Structure**

- Familiarize yourself with key files and directories:
- lib/main.dart: Entry point of the application.
- pubspec.yaml: Manages project dependencies and assets.
- android, ios: Platform-specific code.

9) Create lib/tip_calculator.dart file and implement **TipCalculator** as a stateful widget having a Scaffold with an AppBar and a body section. The screen design is shown in figure 1.

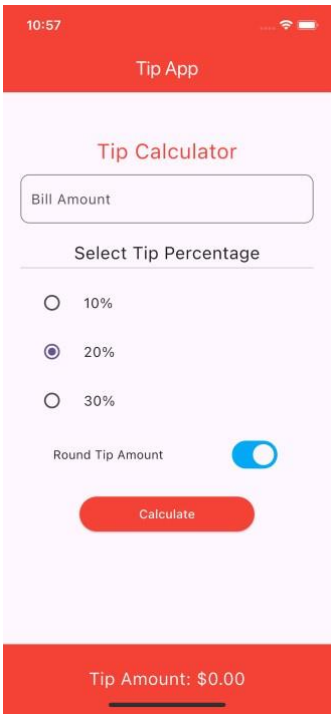

Figure 1 : Tip Calculator

Part B: Tutors Profile

In this section you'll develop **CampusHub**, a peer tutoring platform designed for Qatar University students. CampusHub connects students seeking academic help with qualified peer tutors, creating a collaborative learning environment that enhances the educational experience at QU.

The **CampusHub ecosystem** includes:

- **Students** can browse available tutors, book tutoring sessions, and leave reviews
- **Tutors** can showcase their expertise, set availability, and manage their tutoring profiles
- **Clean, professional interface** that reflects Qatar University's academic standards

You'll build **two profile screens** that demonstrate comprehensive information display in beautifully designed interfaces. This lab emphasizes fundamental Flutter concepts including

widget composition, layout techniques, and styling principles, while intentionally avoiding navigation and state management to maintain focus on core UI development skills.

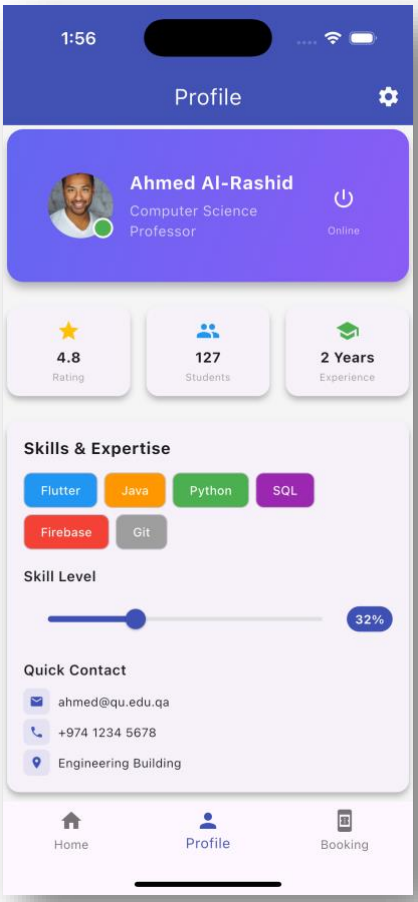

Figure 2 Campus Hub Tutors Profile

1. Create new Flutter project and name it ***campus_hub***
2. You need to build the app section by section then combine them inside the Scaffold body
3. Build the **AppBar**
    - Purple/blue background color (`Color(0xFF6366F1)`)
    - White text and icons
    - Title: "Profile"
    - Settings icon on the right
    - Remove elevation (set to 0)
    - Center the title
4. Profile Header with Gradient
    - **Header Layout (Row):**
        - **Left Side:** Profile avatar with online status indicator
            - CircleAvatar with radius 35
            - Green online dot positioned at bottom-right

        - White border around online indicator
    - **Middle:** Name and title information
        - "Ahmed Al-Rashid" in white, bold, large text
        - "Computer Science Professor" in smaller white text
        - Use Expanded widget for responsive width
    - **Right Side:** Online status column
        - Power icon in white
        - "Online" text below icon
5. Statistics Cards Row
    - Container with horizontal padding (16px)
    - Row with three Expanded cards
    - 12px spacing between cards
6. Skills & Expertise Section
    - White background card with rounded corners
    - Shadow for elevation
    - Margin and padding (16px and 20px respectively)
7. Skill Level Progress
    - "Skill Level" as section title
    - Row containing progress bar and percentage

Part C : Student Profile

Build the student profile screen applying learned concepts:

- Create similar layout with student-specific data
- Apply consistent styling
- Add personal touches and improvements
- Demonstrate understanding through implementation

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Your target layout:
├── Header Section (info + profile picture)
├── Academic Statistics (3-4 stat cards)
├── Current Courses (Course chips or cards)
├── Achievements Section (List or grid)
├── Interests & Activities
└── Study Preferences
```