Experiment	1
Aim	To install Flutter and its dependency. Create an app of your profile including educational qualification, hobby, Technical language known, social media handles etc.
Objective	1. To install flutter. 2. To create basic app for your own profile using UI components of flutter.
Name	Iffat Shabbir Patel
UCID	2024510041
Class	FYMCA
Batch	B
Date of Submission	5-02-25

Technology used	**Flutter**
Task	Part1: Installation of Flutter and its Dependencies Part 2: Create an app of your profile using your creative design.

Code with proper label	**1. Main.dart**
	
	`import 'package:flutter/material.dart';`
	`import 'project.dart';`
	
	`void main() {`
	`  runApp(const MyPortfolioApp());`
	`}`
	
	`class MyPortfolioApp extends StatelessWidget {`
	`  const MyPortfolioApp({super.key});`
	
	`  @override`
	`  Widget build(BuildContext context) {`
	`  return MaterialApp(`
	`  title: 'My Portfolio',`
	`  theme: ThemeData(`
	`  primarySwatch: Colors.blue,`
	`  fontFamily: 'Inter',`
	`  scaffoldBackgroundColor: const Color(0xFF262626),`
	`  textTheme: const TextTheme(`
	`  bodyLarge: TextStyle(color: Colors.white),`
	`  bodyMedium: TextStyle(color: Colors.white),`
	`  ),`
	`  ),`
	`  home: const HomePage(),`
	`  );`
	`  }`
	`}`
	
	`class HomePage extends StatefulWidget {`
	`  const HomePage({super.key});`
	
	`  @override`

```
  _HomePageState createState() => _HomePageState();
}

class _HomePageState extends State<HomePage> {
  int _currentIndex = 0;

  final List<Widget> _sections = [
    const ProfilePage(),
    const ProjectsPage(),
  ];

  @override
  Widget build(BuildContext context) {
    return Scaffold(
      appBar: AppBar(
        title: const Text("My Portfolio"),
        backgroundColor: const Color(0xFFB375B0),
      ),
      body: _sections[_currentIndex],
      bottomNavigationBar: BottomNavigationBar(
        currentIndex: _currentIndex,
        onTap: (index) => setState(() => _currentIndex = index),
        backgroundColor: const Color(0xFFB375B0),
        selectedItemColor:  Colors.white,
        unselectedItemColor: Color.fromARGB(255, 237, 200, 201),
        items: const [
          BottomNavigationBarItem(icon: Icon(Icons.person), label: 'Profile'),
          BottomNavigationBarItem(icon: Icon(Icons.work), label: 'Projects'),
        ],
      ),
    );
  }
}

class ProfilePage extends StatelessWidget {
  const ProfilePage({super.key});

  @override
  Widget build(BuildContext context) {
    return SingleChildScrollView(
      child: Center(
        child: Padding(
          padding: const EdgeInsets.all(16.0),
          child: Column(
            mainAxisAlignment: MainAxisAlignment.start,
            children: [
              // Profile Container
              SizedBox(
                width: 320, // Fixed width for all containers
                child: Container(
                  padding: const EdgeInsets.all(16.0),
                  decoration: BoxDecoration(
                    color: Colors.white24,
                    borderRadius: BorderRadius.circular(16.0),
                  ),
                  child: Column(
```

```
                children: [
                  const CircleAvatar(
                    radius: 50,
                    backgroundImage: AssetImage('assests/profile_image.jpg'),
                  ),
                  const SizedBox(height: 18),
                  const Text(
                    'Iffat Patel',
                    style: TextStyle(
                      fontSize: 30,
                      fontWeight: FontWeight.bold,
                      color: Color(0xFFFBC2C3),
                    ),
                  ),
                  const Text(
                    'Software Developer',
                    style: TextStyle(fontSize: 24, color: Colors.white),
                  ),
                ],
              ),
            ),
          ),
          const SizedBox(height: 24),


          _buildEducationContainer(),


          _buildSkillsContainer(),

          // Hobbies Container
          _buildSectionContainer(
            'Hobbies',
            'Table Tennis, Swimming',
          ),

          // Contact Me Container
          _buildSectionContainer(
            'Contact Me',
            'Email: iffatspatel14@gmail.com\nPhone: 1234567890',
          ),
        ],
      ),
    ),
  ),
 );
}

// Helper method to build section containers
Widget _buildSectionContainer(String title, String content) {
  return SizedBox(
    width: 320,
    child: Container(
      margin: const EdgeInsets.symmetric(vertical: 8.0),
      padding: const EdgeInsets.all(16.0),
      decoration: BoxDecoration(
```

```
        color: const Color.fromARGB(60, 242, 234, 234),
        borderRadius: BorderRadius.circular(16.0),
      ),
      child: Column(
        crossAxisAlignment: CrossAxisAlignment.start,
        children: [
          Text(
            title,
            style: const TextStyle(
              fontSize: 22,
              fontWeight: FontWeight.bold,
              color: Color(0xFFFBC2C3),
            ),
          ),
          const SizedBox(height: 8),
          Text(
            content,
            style: const TextStyle(fontSize: 18),
          ),
        ],
      ),
    ),
  );
}

// Education Container with icons and bullet points
Widget _buildEducationContainer() {
  return SizedBox(
    width: 320, // Fixed width for all containers
    child: Container(
      margin: const EdgeInsets.symmetric(vertical: 8.0),
      padding: const EdgeInsets.all(16.0),
      decoration: BoxDecoration(
        color: Colors.white24,
        borderRadius: BorderRadius.circular(16.0),
      ),
      child: Column(
        crossAxisAlignment: CrossAxisAlignment.start,
        children: [
          const Text(
            'Education',
            style: TextStyle(
              fontSize: 22,
              fontWeight: FontWeight.bold,
              color: Color(0xFFFBC2C3),
            ),
          ),
          const SizedBox(height: 8),
          Column(
            children: const [
              ListTile(
                leading: Icon(Icons.school, color: Colors.white),
                title: Text(
                  'Master of Computer Applications - Pursuing',
                  style: TextStyle(fontSize: 18, color: Colors.white),
```

```
                ),
              ),
              ListTile(
                leading: Icon(Icons.school, color: Colors.white),
                title: Text(
                  'Bachelors in Information Technology - 9.3 cgpa',
                  style: TextStyle(fontSize: 18, color: Colors.white),
                ),
              ),
            ],
          ),
        ],
      ),
    ),
  );
}


Widget _buildSkillsContainer() {
  return SizedBox(
    width: 320,
    child: Container(
      margin: const EdgeInsets.symmetric(vertical: 8.0),
      padding: const EdgeInsets.all(16.0),
      decoration: BoxDecoration(
        color: Colors.white24,
        borderRadius: BorderRadius.circular(16.0),
      ),
      child: Column(
        crossAxisAlignment: CrossAxisAlignment.start,
        children: [
          const Text(
            'Skills',
            style: TextStyle(
              fontSize: 22,
              fontWeight: FontWeight.bold,
              color: Color(0xFFFBC2C3),
            ),
          ),
          const SizedBox(height: 8),
          Column(
            crossAxisAlignment: CrossAxisAlignment.start,
            children: const [
              Text('• Flutter', style: TextStyle(fontSize: 18)),
              Text('• Dart', style: TextStyle(fontSize: 18)),
              Text('• Firebase', style: TextStyle(fontSize: 18)),
              Text('• Node.js', style: TextStyle(fontSize: 18)),
              Text('• Python', style: TextStyle(fontSize: 18)),
            ],
          ),
        ],
      ),
    ),
  );
}
}
```

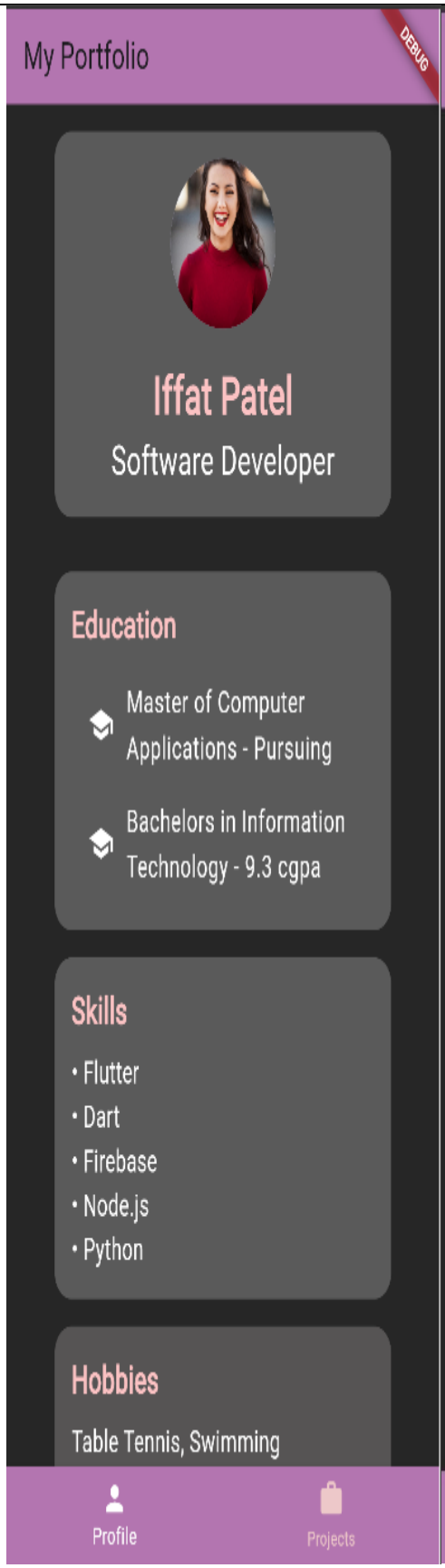
1. Project.dart

```
import 'package:flutter/material.dart';

class ProjectsPage extends StatelessWidget {
 const ProjectsPage({super.key});

 final List<Project> projects = const [
  Project(
   'E-Commerce App',
   'A Flutter mobile app for shopping',
   'https://example.com/ecommerce',
   'assests/ecommerce_image.jpg',
  ),
  Project(
   'Social Media Platform',
   'A platform built with Node.js and React',
   'https://example.com/social-media',
   'assests/chatapp.jpg',
  ),
  Project(
   'Hospital Navigation System',
   'A navigation system in Java using A* algorithm',
   'https://example.com/navigation',
   'assests/navigation.png',
  ),
 ];

 @override
 Widget build(BuildContext context) {
  return Scaffold(
   body: Padding(
    padding: const EdgeInsets.all(16.0),
    child: Column(
     children: [
      // Centered Projects heading
      const Text(
       'Projects',
       style: TextStyle(
        fontSize: 24,
        fontWeight: FontWeight.bold,
        color: Colors.white,
       ),
       textAlign: TextAlign.center,
      ),
      const SizedBox(height: 16),
      Expanded(
       child: ListView.builder(
        itemCount: projects.length,
        itemBuilder: (context, index) {
         return ProjectCard(project: projects[index]);
        },
       ),
      ),
     ],
    ),
```

```
      ),
    );
  }
}

class ProjectCard extends StatelessWidget {
  final Project project;

  const ProjectCard({super.key, required this.project});

  @override
  Widget build(BuildContext context) {
    return Card(
      color: Colors.white24,
      margin: const EdgeInsets.only(bottom: 16),
      child: Padding(
        padding: const EdgeInsets.all(16.0),
        child: Column(
          crossAxisAlignment: CrossAxisAlignment.start,
          children: [
            // Project Image
            Image.asset(
              project.imagePath,
              height: 150,
              width: double.infinity,
              fit: BoxFit.cover,
            ),
            const SizedBox(height: 8),
            // Project Title
            Text(
              project.title,
              style: const TextStyle(
                fontSize: 20,
                fontWeight: FontWeight.bold,
                color: Colors.white,
              ),
            ),
            const SizedBox(height: 8),
            Text(
              project.description,
              style: const TextStyle(fontSize: 16, color: Colors.white),
            ),
            const SizedBox(height: 8),

            InkWell(
              onTap: () {
              },
              child: Text(
                project.link,
                style: const TextStyle(
                  fontSize: 16,
                  color: Colors.blueAccent,
                  decoration: TextDecoration.underline,
                ),
              ),
            ),
```

```
          ],
        ),
      ),
    );
  }
}

class Project {
  final String title;
  final String description;
  final String link;
  final String imagePath;

  const Project(this.title, this.description, this.link, this.imagePath);
}
```

Screenshots



Question and Answers	Answer the following Questions: 1. What is flutter? features and benefits of flutter? Ans-Flutter. Flutter is a framework by Google for building apps. It's used for cross-platform development, so you can write code once and deploy on both iOS and Android. The main language used is Dart. Features: ● Widget-based UI: Customizable, pre-built widgets (Material/Cupertino). ● Hot Reload: Instant code updates without app restart. ● High Performance: Compiles to native ARM code; uses Skia rendering. ● Single Codebase: Works on multiple platforms. ● Rich Ecosystem: Plugins for native features (camera, GPS). Benefits: ● Faster Development: Hot reload + reusable components. ● Cost-Effective: Maintain one codebase. ● Consistent UI: Uniform look across platforms. ● Strong Community: Backed by Google + active developers. ● Native Performance: Smooth animations and responsiveness.
	2. What is dart? why should we use dart as the programming language? Ans-Dart is a client-optimized, object-oriented programming language developed by Google, primarily used for building Flutter apps. Why Use Dart? 1. Optimized for UI: Designed for fast, smooth, and reactive app development. 2. Ahead-of-Time (AOT) Compilation: Enables high-performance native code. 3. Just-in-Time (JIT) Compilation: Powers Hot Reload for faster development. 4. Easy to Learn: Syntax similar to Java, JavaScript, or C#. 5. Productive: Strong tooling (IDE support, debugging, testing). 6. Cross-Platform: Works seamlessly with Flutter for mobile, web, and desktop. 7. Scalable: Suitable for small and large projects. Dart's integration with Flutter makes it ideal for modern, high-performance app development.

	3. How is the basic program of dart written?
	Ans-A basic Dart program consists of a main() function, which is the entry point of the application. Here's a simple example:
	
	void main() {
	print("Hello, Dart!");
	}
	
	Explanation:
	void main(): The entry point of the program. Execution starts here.
	
	print(): Outputs text to the console.
	
	Semicolon (;): Ends a statement in Dart.
	
	Key Points:
	Dart is case-sensitive.

Code is organized into functions, classes, and libraries.

The main() function is mandatory for executable programs.

This is the simplest structure to get started with Dart programming.

4. What do you mean by widgets?
Ans-In Flutter, widgets are the fundamental building blocks used to create the user interface (UI). Everything you see on the screen in a Flutter app is a widget, from buttons and text to layouts and animations. Widgets are immutable, meaning they cannot be changed once created, but they can be replaced with new widgets when the UI needs to update.

5. What do you mean by stateless widgets?
Ans.- A Stateless Widget is a type of widget that does not change over time. It is immutable, meaning once it is created, its properties (or configuration) cannot be modified. Stateless widgets are used for parts of the UI that are static and do not depend on any internal state or user interaction.

1. Immutable: Once created, their properties cannot change.
2. Static Content: Ideal for displaying fixed or unchanging UI elements (e.g., text, icons, images).
3. No Internal State: They do not store or manage any mutable state.
4. Efficient: Since they don't change, Flutter can optimize their rendering.

6. What is stateful widgets?
Ans- A Stateful Widget is a type of widget that can change dynamically over time. Unlike stateless widgets, stateful widgets are mutable and can update their appearance or behavior based on user interaction, data changes, or other events. They are used for parts of the UI that need to be interactive or respond to changes.

1. Mutable: They can change their state during the app's lifecycle.
2. Dynamic Content: Ideal for interactive or updating UI elements (e.g., forms, animations, counters).
3. Internal State: They manage and store mutable state using a separate State object.
4. Reactive: When the state changes, the widget rebuilds to reflect the new state.

7. What is the structure of files in flutter?
Ans-In Flutter, the structure of files and folders is flexible, but there are common conventions and best practices to organize your project effectively. Here's a typical structure for a Flutter app:
lib/:

The core folder for your app's Dart code.

1. main.dart: The entry point of the app where the main() function is defined.
2. screens/: Contains individual screens/pages of the app (e.g., home_screen.dart, profile_screen.dart).
3. widgets/: Contains reusable UI components (e.g., custom_button.dart, header.dart).

4. models/: Contains data models (e.g., user.dart, product.dart).
5. services/: Contains business logic, such as API calls or database interactions.
6. utils/: Contains utility files like constants, helpers, or extensions.
7. routes/: Contains navigation logic and route definitions.
8. android/ and ios/:
9. Platform-specific configuration files for Android and iOS.
10. You usually don't need to modify these unless you're adding native code or custom configurations.
11. test/:Contains unit and widget tests for your app.
12. Example: widget_test.dart for testing UI components.
13. assets/:Stores static files like images, fonts, and JSON data.
14. Example: assets/images/logo.png or assets/fonts/custom_font.ttf.
15. pubspec.yaml:The configuration file for your Flutter project.
16. Defines dependencies, assets, fonts, and other project settings.
17. web/:Contains web-specific files if you're targeting the web platform.

---

8. Steps for installation of flutter. Give step by step installation. What dependent files are required.

Ans- Here's a step-by-step guide to install Flutter and its dependencies:

Step 1: System Requirements
1. OS: Windows, macOS, or Linux.
2. Tools: Git, an IDE (like Android Studio, VS Code).

Step 2: Install Flutter
1. Download Flutter SDK:
   - [Flutter SDK](https://flutter.dev/docs/get-started/install)
   - Extract the ZIP file to a suitable directory (e.g., `C:\src\flutter`).
2. Add Flutter to PATH:
   Add the `flutter/bin` directory to your system's environment variables.

Step 3: Install Dependencies
1. For Android Development:
   - Java JDK: Install [JDK](https://www.oracle.com/java/technologies/javase-jdk11-downloads.html).
   - Android Studio:
     - Install and configure SDK, Android Emulator.
     - Install Flutter and Dart plugins.

2. For iOS Development (macOS only):
   - Install Xcode (from App Store).
   - Run `sudo xcode-select --switch /Applications/Xcode.app/Contents/Developer`.

3. Others: Install Git and ensure it's in your PATH.

Step 4: Verify Installation
1. Open a terminal/command prompt.
2. Run:
   ```
   flutter doctor
   ```
3. Follow instructions to install any missing dependencies.

	Step 5: Test Installation 1. Create a new project: ``` flutter create my_app cd my_app flutter run ``` 9. Command to start flutter application Ans- 1. Navigate to Your Flutter Project Directory-cd your_project_name 2. Run the Flutter Application -flutter run 10. Command to run flutter application Ans-flutter run 11. Command to sync files with emulator. Ans-Hot Reload (Sync UI changes) To sync code changes (like UI updates) instantly without restarting the app, use: r 12. Command to check the issues in flutter application. Ans- 1. flutter doctor-Checks for system-level dependencies and potential setup issues 2. flutter analyze-Analyzes your Dart code for errors, warnings, and potential issues
Conclusion	**Part 1**, have successfully installed Flutter along with its dependencies, set up your development environment, and verified the installation. This foundation enables you to build and run Flutter applications seamlessly on your system. **Part 2**, applied creativity by building a personalized profile app, showcasing the flexibility and power of Flutter for designing interactive and visually appealing applications. This project allowed you to practice app creation, UI design, and functionality implementation.