Name: Sujal.S.Tekwani
Class: D15B
Roll: 59

MAD Lab 5

Aim: Navigation, Routing, and Gestures in Flutter

Introduction

Navigation, routing, and gestures play a crucial role in creating an interactive user experience in Flutter applications. Navigation allows users to switch between different screens, routing ensures smooth transitions between pages, and gestures enable user interactions like tapping, swiping, and long pressing.

Routing and Navigation in Flutter

Flutter manages screen transitions through a **stack-based navigation system**, where pages are stacked on top of each other. This is handled using the `Navigator` widget, which allows adding (`push`) or removing (`pop`) screens dynamically.

Types of Navigation in Flutter

1. **Imperative Navigation (Navigator API)**
    - Uses `Navigator.push()` and `Navigator.pop()`
    - Follows a **Last In, First Out (LIFO)** structure
    - Best for **small-scale applications** with simple navigation
2. **Declarative Navigation (Go Router, Auto Route)**
    - Uses **URL-based navigation** for handling deep links
    - Ideal for **large applications** with complex navigation structures

Navigator and Routes in Flutter

The **Navigator widget** manages a **stack of screens**, where each screen is called a **Route**. It helps in **switching between screens smoothly** and maintains navigation history.

Code Implementation for Event Management App

Let's say your event management app has two screens:

1. **Home Screen** - Displays a list of events
2. **Event Details Screen -** Shows details of a selected event

Code for Navigation in the Event Management App

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



void main() {

  runApp(MaterialApp(home: HomeScreen()));
```

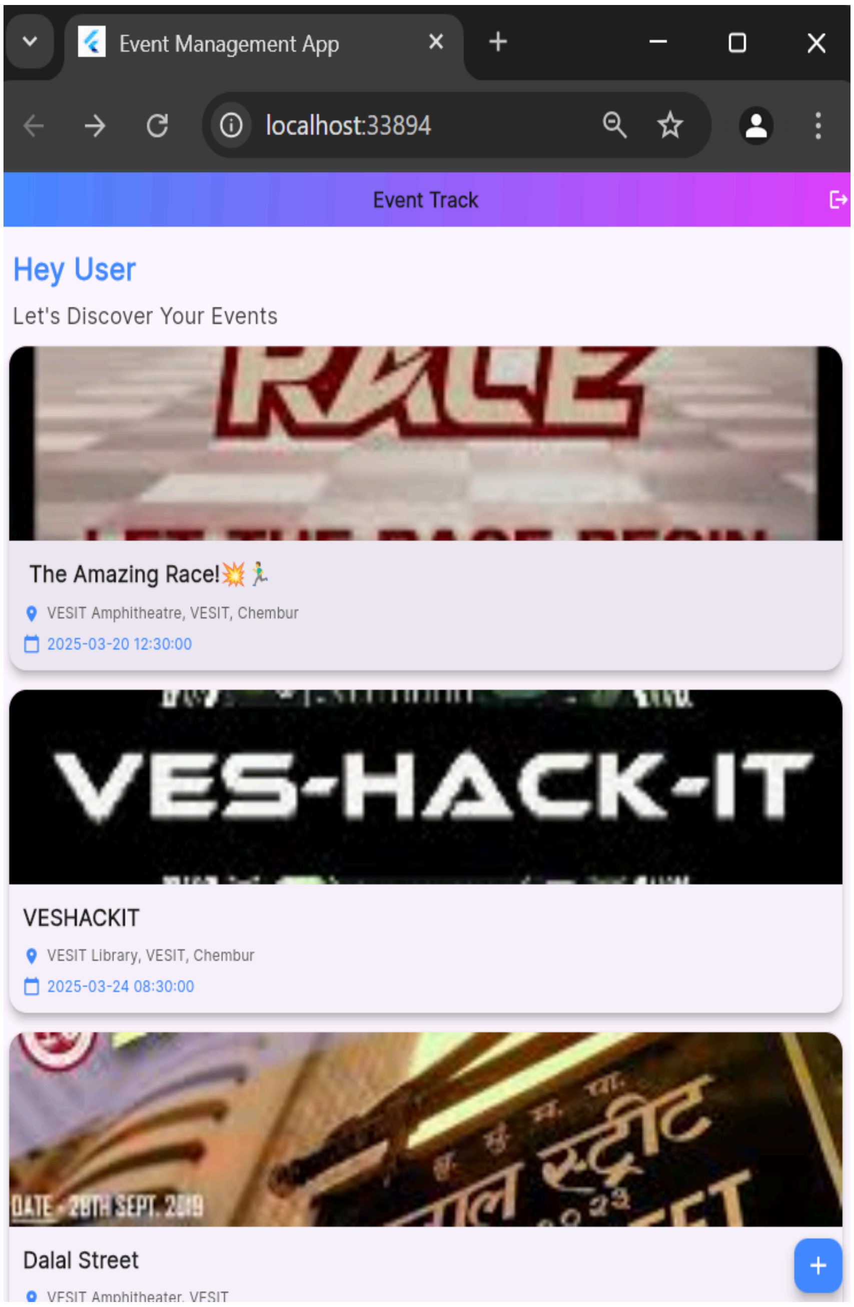
```
}


class HomeScreen extends StatelessWidget {
  @override
  Widget build(BuildContext context) {
    return Scaffold(
      appBar: AppBar(title: Text('Event Management')),
      body: Center(
        child: ElevatedButton(
          onPressed: () {
            // Navigating to EventDetailsScreen with event data
            Navigator.push(
              context,
              MaterialPageRoute(
                builder: (context) => EventDetailsScreen(eventName: "Tech Conference 2025"),
              ),
            );
          },
          child: Text('View Event Details'),
        ),
      ),
    );
  }
}


class EventDetailsScreen extends StatelessWidget {
  final String eventName;
  EventDetailsScreen({required this.eventName});


  @override
  Widget build(BuildContext context) {
    return Scaffold(
      appBar: AppBar(title: Text('Event Details')),
      body: Center(
        child: Column(
          mainAxisAlignment: MainAxisAlignment.center,
          children: [
            Text('Event: $eventName', style: TextStyle(fontSize: 20, fontWeight: FontWeight.bold)),
            SizedBox(height: 20),
            ElevatedButton(
              onPressed: () {
                // Going back to HomeScreen
                Navigator.pop(context);
              },
              child: Text('Go Back'),
            ),
          ],
        ),
      ),
    );
  }
}
```

2. Gesture Detection in Flutter

Flutter's GestureDetector widget captures various gestures like taps, double taps, long presses, and swipes. Below is an example of detecting different gestures.

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

void main() {
  runApp(MaterialApp(home: EventListScreen()));
}

class EventListScreen extends StatefulWidget {
  @override
  _EventListScreenState createState() => _EventListScreenState();
}

class _EventListScreenState extends State<EventListScreen> {
  String _message = "Interact with the event card";

  @override
  Widget build(BuildContext context) {
    return Scaffold(
      appBar: AppBar(title: Text('Event List')),
      body: GestureDetector(
        onTap: () {
          setState(() {
            _message = "Event selected!";
          });
        },
        onDoubleTap: () {
          setState(() {
            _message = "Event added to favorites!";
          });
        },
        onLongPress: () {
          setState(() {
            _message = "Event details opened!";
          });
          Navigator.push(
            context,
            MaterialPageRoute(
              builder: (context) => EventDetailsScreen(eventName: "Music Fest 2025"),
            ),
        );
      },
      onHorizontalDragEnd: (details) {
        setState(() {
          _message = "Swiped! Event removed from list.";
        });
      },
      child: Center(
        child: Container(
          padding: EdgeInsets.all(20),
          margin: EdgeInsets.symmetric(horizontal: 20, vertical: 50),
          decoration: BoxDecoration(
            color: Colors.blueAccent,
            borderRadius: BorderRadius.circular(15),
            boxShadow: [
              BoxShadow(color: Colors.black26, blurRadius: 5, spreadRadius: 2)
            ],
          ),
          child: Column(
            mainAxisSize: MainAxisSize.min,
            children: [
              Text(
                "Music Fest 2025",
                style: TextStyle(fontSize: 24, fontWeight: FontWeight.bold, color: Colors.white),
              ),
              SizedBox(height: 10),
              Text(
                _message,
                style: TextStyle(fontSize: 18, color: Colors.white70),
              ),
            ],
          ),
        ),
      ),
    ),
  );
 }
}

class EventDetailsScreen extends StatelessWidget {
  final String eventName;

  EventDetailsScreen({required this.eventName});

  @override
 Widget build(BuildContext context) {
  return Scaffold(
   appBar: AppBar(title: Text('Event Details')),
   body: Center(
    child: Text(
     'Details for $eventName',
     style: TextStyle(fontSize: 20, fontWeight: FontWeight.bold),
    ),
   ),
  );
 }
}
```

OUTPUT



Hey User

Let's Discover Your Events

The Amazing Race!💥🏃

VESIT Amphitheatre, VESIT, Chembur

2025-03-20 12:30:00

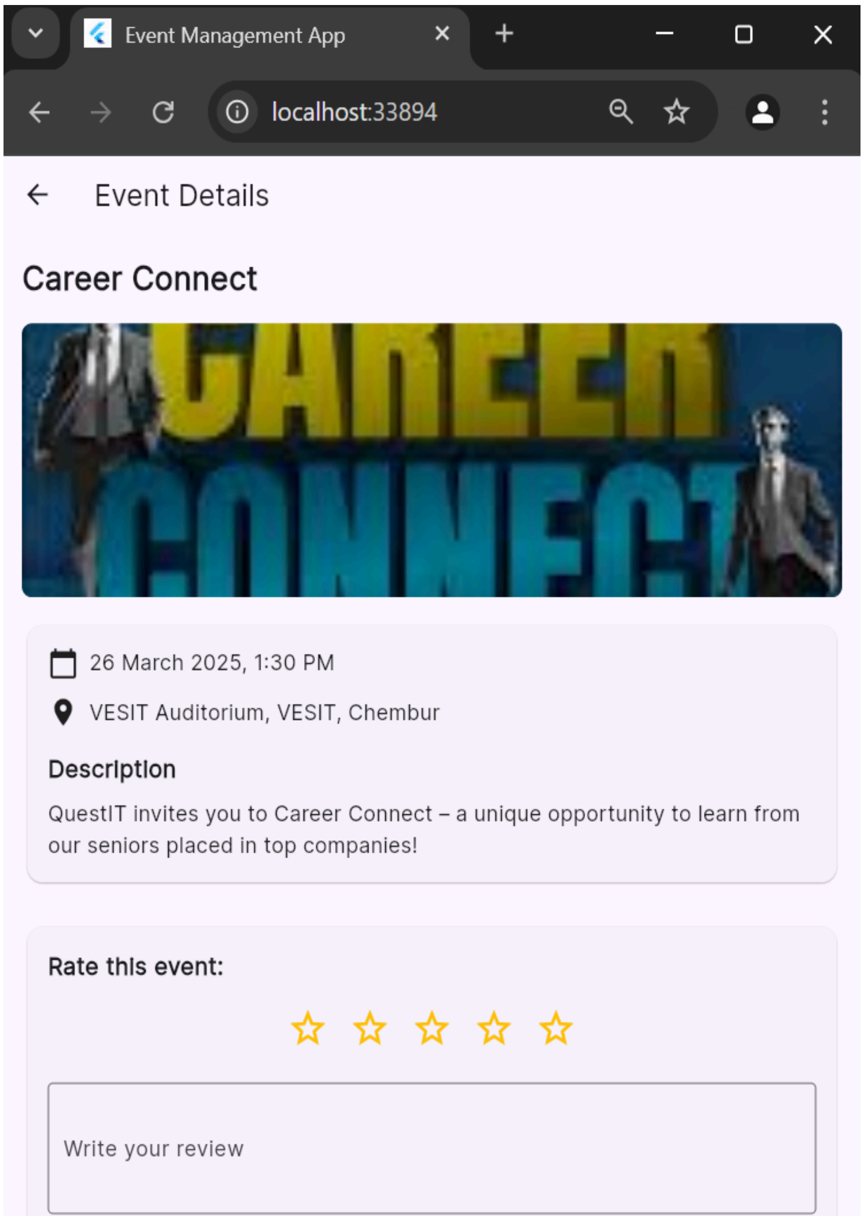
VESHACKIT

VESIT Library, VESIT, Chembur

2025-03-24 08:30:00

Dalal Street

VESIT Amphitheater, VESIT



Event Details

Career Connect

26 March 2025, 1:30 PM

VESIT Auditorium, VESIT, Chembur

Description

QuestIT invites you to Career Connect – a unique opportunity to learn from our seniors placed in top companies!

Rate this event:

☆ ☆ ☆ ☆ ☆

Write your review

Conclusion

Navigation allows movement between screens using Navigator. Routing helps structure navigation better using named routes. Gesture detection enables interactivity with user input. These features make Flutter apps more user-friendly.