MAD & PWA Lab
Journal

Experiment No.	05
Experiment Title.	To apply navigation, routing and gestures in Flutter App
Roll No.	60
Name	Pranav Titambe
Class	D15A
Subject	MAD & PWA Lab
Lab Outcome	LO2: Design and Develop interactive Flutter App by using widgets, layouts, gestures and animation
Grade:	

Aim: To apply navigation, routing and gestures in Flutter App

Theory:

Flutter provides tools to handle navigation, routing, and gestures, allowing users to move between screens and interact with the app smoothly. These features help create a user-friendly experience in mobile applications.

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1. Navigation in Flutter

Navigation is the process of moving between different screens (or pages) in a Flutter app. Flutter uses a stack-based approach for navigation, where new screens are pushed onto the stack and removed when the user navigates back.

Types of Navigation:

- Push Navigation: Moves to a new screen and adds it to the stack.
- Pop Navigation: Removes the current screen and returns to the previous one.
- Named Routes: Uses pre-defined route names to navigate.
- Navigation with Data: Allows passing data between screens when navigating.

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2. Routing in Flutter

Routing helps in managing different screens efficiently. Instead of manually handling each screen transition, Flutter allows defining routes in a structured way.

Types of Routing:

- Direct Routing: Navigates to a specific screen using explicit methods.
- Named Routing: Uses a predefined route name to navigate, making the app more organized.

Routing improves app maintainability, especially in apps with multiple screens.

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3. Gestures in Flutter

Gestures enable user interaction in Flutter applications. Flutter provides built-in gesture detection capabilities for touch-based interactions.

Common Gestures:

- Tap: A single touch interaction.
- Double Tap: Two quick consecutive taps.

- Long Press: Holding a touch for a longer duration.
- Swipe: Moving a finger across the screen.
- Drag: Moving an object by pressing and holding it.

Gestures are essential for making apps interactive and responsive.

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4. Combining Navigation and Gestures

Navigation and gestures can be combined to enhance user experience. For example:

- Tapping on a button can navigate to another screen.
- Swiping a card can delete an item or move to another page.
- Dragging an element can reposition items within the app.

Navigation, routing, and gestures are fundamental to creating an interactive Flutter application. Navigation allows movement between screens, routing helps manage screens efficiently, and gestures enable touch interactions. Mastering these concepts helps in developing dynamic and user-friendly Flutter applications.

Code:

login.dart file

```dart
import 'package:dailyhunt/languages.dart';
import 'package:flutter/material.dart';
import 'home.dart';

class Login extends StatefulWidget {
  const Login({super.key});

  @override
  State<Login> createState() =>
_LoginState();
}

class _LoginState extends State<Login> {
  final TextEditingController emailController
= TextEditingController();
  final TextEditingController
passwordController =
TextEditingController();

  @override

  Widget build(BuildContext context) {
    return Scaffold(
      body: Stack(
        children: [
          // Background Image
          Align(
            alignment: Alignment.topCenter,
            child: Container(
              height: 580, // Adjust the height as
needed
              decoration: BoxDecoration(
                image: DecorationImage(
                  image:
AssetImage("assets/background.png"),
                  fit: BoxFit.scaleDown,
                ),
              ),
            ),
          ),
```

```dart
          // Skip Button
          Positioned(
            top: 40,
            right: 20,
            child: TextButton(
              onPressed: () {
                debugPrint("Skipped");
                Navigator.push(context,
MaterialPageRoute(builder: (context) {
                  return Languages();
                }));
              },
              child: Row(
                mainAxisSize: MainAxisSize.min,
                children: const [
                  Text(
                    "Skip",
                    style: TextStyle(fontSize: 20,
color: Color(0xFF001A6E)),
                  ),
                  SizedBox(width: 5),
                  Icon(Icons.arrow_forward, size:
30, color: Color(0xFF001A6E)),
                ],
              ),
            ),
          ),

          // Login Card
          Align(
            alignment: Alignment.bottomCenter,
            child: Container(
              width: double.infinity,
              padding: const EdgeInsets.all(24),
              decoration: const BoxDecoration(
                color: Color.fromARGB(255, 231,
255, 246), // Light Teal Card
                borderRadius: BorderRadius.only(
                  topLeft: Radius.circular(30),
                  topRight: Radius.circular(30),
                ),
              ),
              child: Column(
                mainAxisSize: MainAxisSize.min,
                children: [
                  const Text(
                    "Welcome Back!",
                    style: TextStyle(
                      fontSize: 22,
                      fontWeight: FontWeight.bold,
                      color: Color(0xFF001A6E),
                    ),
                  ),
                  const SizedBox(height: 10),
                  const Text(
                    "Login to your account",
                    style: TextStyle(fontSize: 16,
color: Colors.black54),
                  ),
                  const SizedBox(height: 20),

                  // Email Field
                  TextField(
                    controller: emailController,
                    decoration: InputDecoration(
                      labelText: "Email",
                      prefixIcon: const
Icon(Icons.email),
                      border: OutlineInputBorder(
                        borderRadius:
BorderRadius.circular(10),
                      ),
                    ),
                  ),
                  const SizedBox(height: 16),

                  // Password Field
                  TextField(
                    controller: passwordController,
                    obscureText: true,
                    decoration: InputDecoration(
                      labelText: "Password",
                      prefixIcon: const
Icon(Icons.lock),
                      border: OutlineInputBorder(
                        borderRadius:
BorderRadius.circular(10),
                      ),
                    ),
                  ),
                  const SizedBox(height: 20),

                  // Login Button
                  ElevatedButton(
                    onPressed: () {
                      // TODO: Implement login
logic
                    },
```

```dart
              style:                                    ],
ElevatedButton.styleFrom(                             ),
            backgroundColor: const                    ),
Color(0xFF074799), // Deep Blue                        ),
            padding: const                            ],
EdgeInsets.symmetric(                                 ),
              horizontal: 40, vertical: 12),          );
            shape:                                     }
RoundedRectangleBorder(                     }
              borderRadius:
BorderRadius.circular(8),
            ),
          ),
          child: const Text(
            "Login",
            style: TextStyle(
              fontSize: 16,
              color: Color(0xFFE1FFBB), //
Light Greenish-Yellow
            ),
          ),
        ),
        const SizedBox(height: 5),

        // Forgot Password & Signup
Text
        TextButton(
          onPressed: () {
            // TODO: Implement Forgot
Password Logic
          },
          child: const Text(
            "Forgot Password?",
            style: TextStyle(color:
Colors.black54),
          ),
        ),
        TextButton(
          onPressed: () {
            // TODO: Implement Signup
Navigation
          },
          child: const Text(
            "Don't have an account? Sign
up",
            style: TextStyle(color:
Colors.black54),
          ),
        ),
```

languages.dart file

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

class Languages extends StatefulWidget {
  const Languages({super.key});

  @override
  State<Languages> createState() =>
_LanguagesState();
}

class _LanguagesState extends
State<Languages> {
  // Dictionary with language names as keys
and language codes as values
  final Map<String, String> languages = {
    "English": "en",
    "Spanish": "es",
    "French": "fr",
    "German": "de",
    "Hindi": "hi",
    "Mandarin": "zh",
    "Japanese": "ja",
    "Arabic": "ar",
    "Marathi":"mr"
  };

  // Store selected language code
  String? _selectedLanguageCode;

  @override
  Widget build(BuildContext context) {
    return Scaffold(
      appBar: AppBar(
        title: const Text("Select Language"),
        backgroundColor: const
Color(0xFF001A6E),
        foregroundColor: Colors.white,
      ),
      body: Padding(
        padding: const EdgeInsets.all(16.0),
        child: Column(
          crossAxisAlignment:
CrossAxisAlignment.start,
          children: [
            const Text(
              "Languages",
              style: TextStyle(
                color: Color(0xFF001A6E),
                fontSize: 20,
                fontWeight: FontWeight.bold,
              ),
            ),
            const SizedBox(height: 10),
            Expanded(
              child: ListView(
                children:
languages.entries.map((entry) {
                  return Card(
                    elevation: 2,
                    child: RadioListTile<String>(
                      title: Text(entry.key), // Display
language name
                      value: entry.value, // Use
language code as value
                      groupValue:
_selectedLanguageCode,
                      onChanged: (value) {
                        setState(() {
                          _selectedLanguageCode =
value;
                        });
                      },
                    ),
                  );
                }).toList(),
              ),
            ),
          ],
        ),
      ),
      floatingActionButton:
FloatingActionButton.extended(
        onPressed: () {
          if (_selectedLanguageCode != null) {
            debugPrint("Selected Language:
$_selectedLanguageCode");
            // Pass selected language code to
API or next screen

ScaffoldMessenger.of(context).showSnackBar(
              SnackBar(content: Text("Selected
Language: $_selectedLanguageCode")),
            );
```

```dart
        Navigator.push(context,
MaterialPageRoute(builder: (context) {
          return Home(lang:
_selectedLanguageCode!);
        }));
      }
    },
    label: const Text("Confirm",style:
TextStyle(color: Colors.white),),
    icon: const Icon(Icons.check,color:
Colors.white,),
    backgroundColor: const
Color(0xFF001A6E),
    ),
  );
 }
}
```

home.dart file

```dart
import
'package:dailyhunt/NewsPageDetail.dart';
import
'package:dailyhunt/api/news_api.dart';
import
'package:dailyhunt/model/news_model.dart';
import 'package:flutter/material.dart';
import 'package:intl/intl.dart';

class Home extends StatefulWidget {
  final String lang;
  Home({super.key, required this.lang});

  @override
  State<Home> createState() =>
_HomeState();
}

class _HomeState extends State<Home> {
  List<NewsModel> newsList = [];
  NewsApi newsApi = NewsApi();

  Future<void> getTopNews() async {
    List<NewsModel> fetchedNews = await
newsApi.getTopHeadlines(widget.lang);
    setState(() {
      newsList = fetchedNews;
    });
  }

  int _selectedIndex = 0;

  void _onItemTapped(int index) {
    setState(() {
      _selectedIndex = index;
    });
  }

  @override
  void initState() {
    super.initState();
    getTopNews();
  }

  String formatDate(DateTime date) {
    String day =
DateFormat('d').format(date);
    String suffix =
getDaySuffix(int.parse(day));
    String formattedDate = "$day$suffix
${DateFormat('MMM yyyy').format(date)}";
    return formattedDate;
  }

  String getDaySuffix(int day) {
    if (day >= 11 && day <= 13) {
      return "th";
    }
    switch (day % 10) {
      case 1:
        return "st";
      case 2:
        return "nd";
      case 3:
        return "rd";
      default:
        return "th";
    }
  }

  @override
  Widget build(BuildContext context) {
    return Scaffold(
      appBar: AppBar(
        backgroundColor: Colors.indigo[900],
        foregroundColor: Colors.green[200],
        title: const Text("The Daily Globe"),
        titleTextStyle: const TextStyle(
          fontWeight: FontWeight.bold,
          fontSize: 20,
        ),
        elevation: 0,
        automaticallyImplyLeading: false,
        actions: [
          IconButton(
            icon: const Icon(Icons.notifications,
color: Colors.white),
            onPressed: () {},
          ),
        ],
      ),
      body: Padding(
        padding: const EdgeInsets.all(5.0),
        child: SingleChildScrollView(
          child: Column(
```

```dart
            children: [
              Column(
                crossAxisAlignment:
CrossAxisAlignment.start,
                children: [
                  const Padding(padding: const
EdgeInsets.all(16),
                  child: Column(
                    crossAxisAlignment:
CrossAxisAlignment.start,
                    children: [
                      const Text(
                        'Welcome back, Tyler!',
                        style: TextStyle(fontSize: 24,
fontWeight: FontWeight.bold),
                      ),
                      const SizedBox(height: 5),
                      const Text(
                        'Discover a world of news
that matters to you',
                        style: TextStyle(fontSize: 16,
color: Colors.grey),
                      ),
                      const SizedBox(height: 20),
                      const SectionHeader(title:
'Trending news'),
                    ],
                  ),),

              SizedBox(
                height:
MediaQuery.of(context).size.height * 0.35,
                child: newsList.isEmpty
                    ? const Center(child:
CircularProgressIndicator())
                    : ListView.builder(
                      scrollDirection:
Axis.horizontal,
                      itemCount: newsList.length,
                      itemBuilder: (context, index) {
                        return NewsCard(
                          category: 'Business',
                          title: newsList[index].title,
                          source:
newsList[index].source,
                          image:
newsList[index].image,
                          date: DateFormat('d MMM
yyyy')
                          .format(newsList[index].publishedAt),

                          content:newsList[index].content
                          );
                      },
                    ),
                  ),
                  const SizedBox(height: 20),
                  const SectionHeader(title:
'Recommendation'),
                  const RecommendationCard(),
                ],
              ),
            ],
          ),
        ),
      ),
      bottomNavigationBar: Container(
        decoration: BoxDecoration(
          color: Colors.indigo[900],
          borderRadius: const
BorderRadius.only(
            topLeft: Radius.circular(20),
            topRight: Radius.circular(20),
          ),
          boxShadow: [
            BoxShadow(
              color:
Colors.black.withOpacity(0.3),
              blurRadius: 10,
              spreadRadius: 2,
            ),
          ],
        ),
        child: ClipRRect(
          borderRadius: const
BorderRadius.only(
            topLeft: Radius.circular(20),
            topRight: Radius.circular(20),
          ),
          child: BottomNavigationBar(
            backgroundColor:
Colors.indigo[900],
            currentIndex: _selectedIndex,
            onTap: _onItemTapped,
            selectedItemColor:
Colors.green[200],
            unselectedItemColor:
```

```dart
        Colors.white70,
        showUnselectedLabels: false,
        type:
BottomNavigationBarType.fixed,
        items: const [
          BottomNavigationBarItem(
            icon: Icon(Icons.home, size: 28),
            label: 'Home',
          ),
          BottomNavigationBarItem(
            icon: Icon(Icons.search, size: 28),
            label: 'Search',
          ),
          BottomNavigationBarItem(
            icon: Icon(Icons.person, size: 28),
            label: 'Profile',
          ),
        ],
      ),
    ),
  ),
);
 }
}

class SectionHeader extends
StatelessWidget {
  final String title;
  const SectionHeader({super.key, required
this.title});

  @override
  Widget build(BuildContext context) {
    return Row(
      mainAxisAlignment:
MainAxisAlignment.spaceBetween,
      children: [
        Text(
          title,
          style: const TextStyle(fontSize: 18,
fontWeight: FontWeight.bold),
        ),
        TextButton(
          onPressed: () {},
          child: Text('See all', style:
TextStyle(color: Colors.indigo[900])),
        ),
      ],
    );
```

```dart
   }
}

class NewsCard extends StatelessWidget {
  final String category, title, source, date,
image,content;
  const NewsCard(
    {super.key,
      required this.category,
      required this.title,
      required this.source,
      required this.image,
      required this.date,
      required this.content});

  @override
  Widget build(BuildContext context) {
    return GestureDetector(
      onTap: (){
        Navigator.push(context,
MaterialPageRoute(builder:
(context)=>NewsDetailPage(title: title,
source: source, publishedAt: date, image:
image, content:content )));
      },
      child: Container(
        width: 250,
        margin: const EdgeInsets.only(right:
10),
        decoration: BoxDecoration(
          color: const Color(0xFF009990),
          borderRadius:
BorderRadius.circular(10),
          boxShadow: [BoxShadow(color:
Colors.grey.shade300, blurRadius: 5)],
        ),
        child: Column(
          crossAxisAlignment:
CrossAxisAlignment.start,
          children: [
            Container(
              height: 100,
              decoration: BoxDecoration(
                borderRadius:
                const BorderRadius.vertical(top:
Radius.circular(10)),
                image: DecorationImage(
                  image: NetworkImage(image),
                  fit: BoxFit.cover,
```

```dart
          ),
        ),
      ),
      Padding(
        padding: const EdgeInsets.all(8.0),
        child: Column(
          crossAxisAlignment:
CrossAxisAlignment.start,
          children: [
            Container(
              decoration: BoxDecoration(
                borderRadius:
BorderRadius.circular(10),
                color: Colors.indigo[900],
              ),
              height: 20,
              width: 100,
              alignment: Alignment.center,
              child: Text(
                category,
                style: const TextStyle(color:
Colors.white),
              ),
            ),
            Text(title,
              style: const TextStyle(
                fontSize: 16, fontWeight:
FontWeight.bold)),
            const SizedBox(height: 5),
            Text('$source • $date', style:
const TextStyle(color: Colors.white)),
          ],
        ),
      ),
    ],
  ),
  ),
);
 }
}

class RecommendationCard extends
StatefulWidget {
  const RecommendationCard({super.key});

  @override
  State<RecommendationCard>
createState() =>
_RecommendationCardState();
```

```dart
}
class _RecommendationCardState extends
State<RecommendationCard> {
  @override
  Widget build(BuildContext context) {
    return Container(
      padding: const EdgeInsets.all(16),
      decoration: BoxDecoration(
        color: Color(0xFF009990),
        borderRadius:
BorderRadius.circular(10),
        boxShadow: [BoxShadow(color:
Colors.grey.shade300, blurRadius: 5)],
      ),
      child: Column(
        crossAxisAlignment:
CrossAxisAlignment.start,
        children: [
          Row(
            mainAxisAlignment:
MainAxisAlignment.spaceBetween,
            children: [
              Row(
                children: const [
                  Icon(Icons.business, color:
Colors.black),
                  SizedBox(width: 5),
                  Text('Forbes', style:
TextStyle(fontWeight: FontWeight.bold)),
                ],
              ),
              TextButton(onPressed: () {}, child:
const Text('Follow')),
            ],
          ),
          const SizedBox(height: 5),
          const Text(
            'Tech Startup Secures \$50 Million
Funding for Expansion',
            style: TextStyle(fontSize: 16,
fontWeight: FontWeight.bold),
          ),
          const SizedBox(height: 5),
          Container(
            decoration: BoxDecoration(
              borderRadius:
BorderRadius.circular(10),
              color: Colors.indigo[900],
```

```dart
      ),                                                ),
      height: 20,                                       ),
      width: 100,                                       ],
      alignment: Alignment.center,                  ),
      child: Text(                                   );
        "Business",                                }
        style: const TextStyle(                    }
          color: Colors.white,
        ),
```

NewsPageDetail.dart file

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

class NewsDetailPage extends
StatelessWidget {
  final String title, source, publishedAt,
image, content;

  const NewsDetailPage({
    super.key,
    required this.title,
    required this.source,
    required this.publishedAt,
    required this.image,
    required this.content,
  });

  @override
  Widget build(BuildContext context) {
    return Scaffold(
      backgroundColor: const
Color(0xFFE1FFBB), // Light green
background
      body: CustomScrollView(
        slivers: [
          SliverAppBar(
            expandedHeight: 250,
            floating: false,
            pinned: true,
            backgroundColor: const
Color(0xFF001A6E), // Dark blue app bar
            flexibleSpace: FlexibleSpaceBar(
              background: ClipRRect(
                borderRadius:
                const
BorderRadius.vertical(bottom:
Radius.circular(30)),
                child: Image.network(
                  image,
                  fit: BoxFit.cover,
                ),
              ),
            ),
          ),
          SliverToBoxAdapter(
            child: Container(
              decoration: BoxDecoration(
                color: Colors.white,
                borderRadius: const
BorderRadius.vertical(
                  top: Radius.circular(30),
                ),
                boxShadow: [
                  BoxShadow(
                    color:
Colors.grey.withOpacity(0.3),
                    blurRadius: 10,
                    spreadRadius: 2,
                  ),
                ],
              ),
              padding: const
EdgeInsets.symmetric(horizontal: 20,
vertical: 25),
              child: Column(
                crossAxisAlignment:
CrossAxisAlignment.start,
                children: [
                  Text(
                    title,
                    style: const TextStyle(
                      fontSize: 22,
                      fontWeight: FontWeight.bold,
                      color: Color(0xFF074799), //
Medium blue title
                    ),
                  ),
                  const SizedBox(height: 10),
                  Row(
                    children: [
                      const CircleAvatar(
                        radius: 14,
                        backgroundColor:
Color(0xFF009990), // Teal avatar
                        child: Icon(Icons.person,
color: Colors.white, size: 16),
                      ),
                      const SizedBox(width: 8),
                      Text(
                        source,
                        style: const TextStyle(
                          fontSize: 14,
                          fontWeight:
FontWeight.w500,
                          color: Colors.black87,
```

```dart
          ),
        ),
        const SizedBox(width: 8),
        Text(
          "• $publishedAt",
          style: const TextStyle(
            fontSize: 14,
            color: Colors.grey,
          ),
        ),
      ],
    ),
    const SizedBox(height: 20),
    Text(
      content,
      style: const TextStyle(
        fontSize: 16,
        color: Colors.black87,
        height: 1.5,
      ),
    ),
  ],
),
      ),
    ),
  ],
),
);
}
}
```
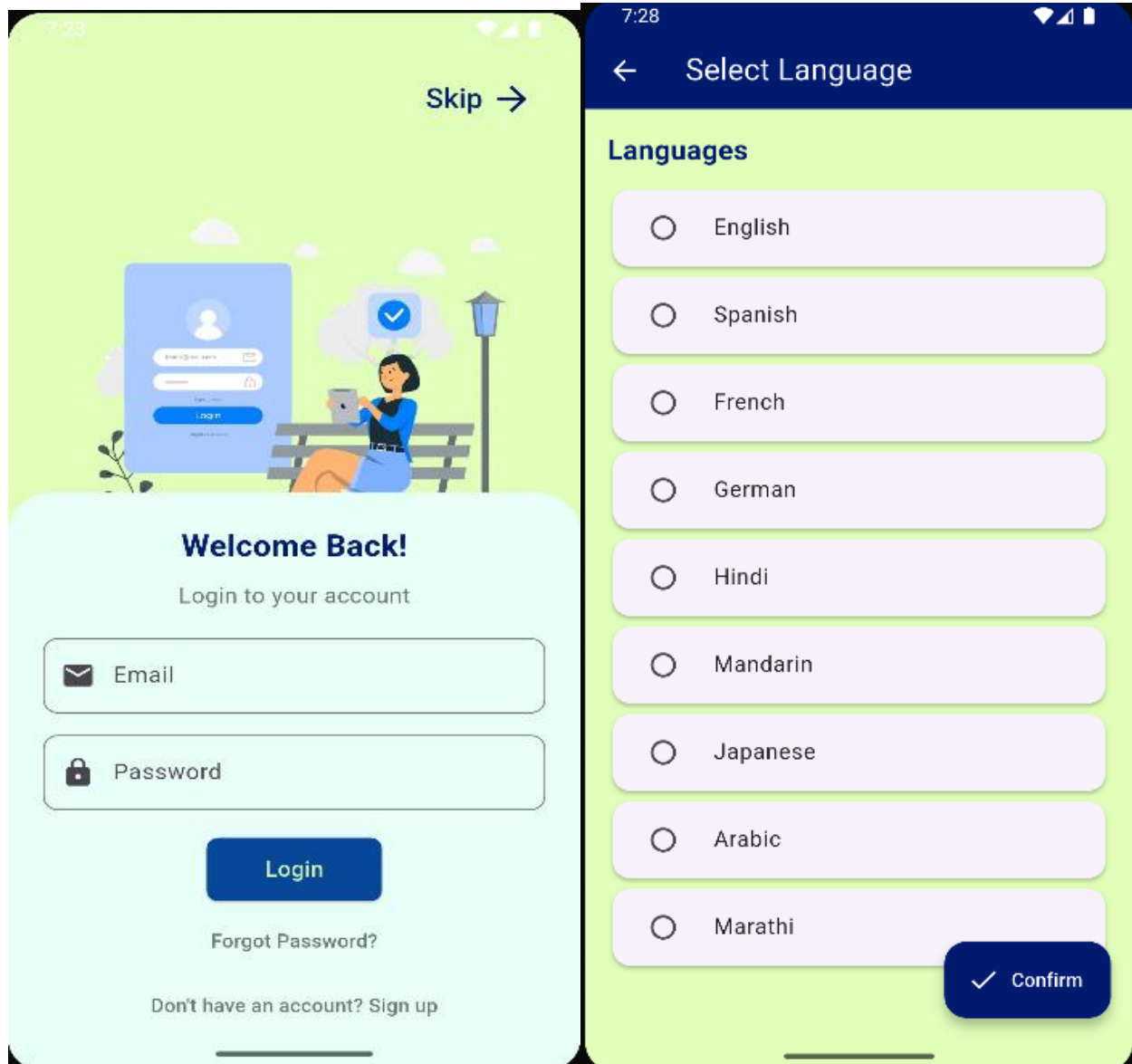
Output:

After clicking skip button it will navigate to languages.dart page
And
After clicking shopping cart icon in topbar it will redirect to bag.dart page

After selecting language and clicking on confirm then it will navigate to home.dart
And
After clicking on any news card then it will navigate to newsdetailpage.dart