MAD & PWA Lab
Journal

Experiment No.	05
Experiment Title.	To apply navigation, routing and gestures in Flutter App
Roll No.	20
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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:

home.dart file

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

void main() {
 runApp(MyApp());
}
final List<Map<String, String>>
productDetails = [
 {"tagline": "Flat 30% off", "description":
"Puma"},
 {"tagline": "Buy 1 Get 1", "description":
"Marks and Spencer"},
 {"tagline": "New Arrivals", "description":
"Miraggio"},
 {"tagline": "Best Seller", "description":
"Levis"},
 {"tagline": "Special Discount", "description":
"HopScotch"},
 {"tagline": "Hot Deal", "description":
"Nayam"},
];
class MyApp extends StatelessWidget {
 @override
 Widget build(BuildContext context) {
   return MaterialApp(
     debugShowCheckedModeBanner: false,
     home: NykaaHomePage(),
   );
 }
}

class NykaaHomePage extends
StatelessWidget {
 @override
 Widget build(BuildContext context) {
   return Scaffold(
     appBar: AppBar(
```

```dart
        backgroundColor: Colors.white,
        elevation: 0,
        title:
Image.asset('assets/nykaa_logo.png',
height: 40),
        actions: [
          IconButton(icon:
Icon(Icons.favorite_border, color:
Colors.black), onPressed: () {}),
          IconButton(
            icon: const Icon(Icons.shopping_cart,
color: Colors.black),
            onPressed: () {
              Navigator.push(
                context,
                MaterialPageRoute(builder:
(context) => ShoppingBagScreen()), //
Replace with your target screen
              );
            },
          ),
        ],
      ),
      body: SingleChildScrollView(
        child: Column(
          children: [
            // Search Bar
            Padding(
              padding:
EdgeInsets.symmetric(horizontal: 10),
              child: TextField(
                decoration: InputDecoration(
                  prefixIcon: Icon(Icons.search),
                  hintText: "Search earrings",
                  border:
OutlineInputBorder(borderRadius:
BorderRadius.circular(30)),
                  filled: true,
                  fillColor: Colors.grey[200],
                ),
              ),
            ),
            SizedBox(height: 10),

            // Category Tabs
            Padding(
              padding:
EdgeInsets.symmetric(horizontal: 10),
              child: Row(
                mainAxisAlignment:
MainAxisAlignment.spaceEvenly,
                children: ["Women", "Men", "Kids",
"Home"].map((category) {
                  return Chip(
                    label: Text(category),
                    backgroundColor:
Colors.pink.shade100,
                  );
                }).toList(),
              ),
            ),
            SizedBox(height: 10),

            // Scrollable Categories
            SizedBox(
              height: 90,
              child: ListView(
                scrollDirection: Axis.horizontal,
                padding:
EdgeInsets.symmetric(horizontal: 10), //
Padding around the entire list
                children: [
                  Padding(
                    padding: EdgeInsets.only(right:
10), // Space between the cards
                    child: CategoryCard(category:
"Westernwear", image:
"assets/westernwear.png"),
                  ),
                  Padding(
                    padding: EdgeInsets.only(right:
10),
                    child: CategoryCard(category:
"Indianwear", image:
"assets/indianwear.png"),
                  ),
                  Padding(
                    padding: EdgeInsets.only(right:
10),
                    child: CategoryCard(category:
"Footwear", image: "assets/footwear.png"),
                  ),
                  Padding(
                    padding: EdgeInsets.only(right:
10),
                    child: CategoryCard(category:
"Winterwear", image:
"assets/winterwear.png"),
```

```dart
          ),
        ],
      ),
    ),
    SizedBox(height: 10),


    // Offer Banner
    Padding(
      padding:
EdgeInsets.symmetric(horizontal: 10),
      child:
Image.asset('assets/offer_banner.png', fit:
BoxFit.cover),
    ),
    SizedBox(height: 10),


    // Sale Banner
    Padding(
      padding:
EdgeInsets.symmetric(horizontal: 10),
      child:
Image.asset('assets/sale_banner.png', fit:
BoxFit.cover),
    ),
    SizedBox(height: 20),


    // Grid Section (2 columns, 3 rows)
    Padding(
      padding:
EdgeInsets.symmetric(horizontal: 10),
      child: GridView.builder(
        shrinkWrap: true,
        physics:
NeverScrollableScrollPhysics(),
        gridDelegate:
SliverGridDelegateWithFixedCrossAxisCou
nt(
          crossAxisCount: 2,
          mainAxisSpacing: 10,
          crossAxisSpacing: 10,
          childAspectRatio: 0.8,
        ),
        itemCount: productDetails.length,
        itemBuilder: (context, index) {
          return ProductCard(
            image: "assets/product${index +
1}.png",

            tagline:
productDetails[index]["tagline"]!,
            description:
productDetails[index]["description"]!,
          );
        },
      ),
    ),
    SizedBox(height: 20),
  ],
 ),
),


// Bottom Navigation Bar
bottomNavigationBar:
BottomNavigationBar(
  currentIndex: 0,
  selectedItemColor: Colors.black, // Set
selected icon color
  unselectedItemColor: Colors.grey, // Set
unselected icon color
  backgroundColor: Colors.white, //
Ensure background is visible
  showUnselectedLabels: true, // Show
labels even when unselected
  type: BottomNavigationBarType.fixed, //
Keeps icons and text aligned
  onTap: (index) {
   if (index == 1) {
    Navigator.push(
     context,
     MaterialPageRoute(builder:
(context) => CategoriesPage()),
    );
   }
  },
  items: [
   BottomNavigationBarItem(icon:
Icon(Icons.home), label: 'Home'),
   BottomNavigationBarItem(icon:
Icon(Icons.category), label: 'Categories'),
   BottomNavigationBarItem(icon:
Icon(Icons.style), label: 'Stay Stylish'),
   BottomNavigationBarItem(icon:
Icon(Icons.account_circle), label: 'Account'),
  ],
 ),
);
}
```

```dart
}

// Category Card Widget
class CategoryCard extends
StatelessWidget {
 final String category;
 final String image;

 const CategoryCard({required
this.category, required this.image});

 @override
 Widget build(BuildContext context) {
  return Column(

   children: [

    CircleAvatar(
     backgroundImage:
AssetImage(image),
     radius: 30,
    ),
    SizedBox(height: 5),
    Text(category, style: TextStyle(fontSize:
12, fontWeight: FontWeight.bold)),

   ],
  );
 }
}

// Product Card Widget
class ProductCard extends StatelessWidget
{
 final String image;
 final String tagline;
 final String description;

 const ProductCard({required this.image,
required this.tagline, required
this.description});

 @override
 Widget build(BuildContext context) {
  return Card(
   elevation: 5,
   child: Column(
    crossAxisAlignment:
CrossAxisAlignment.start,
    children: [
     Expanded(
      child: Image.asset(image, fit:
BoxFit.cover, width: double.infinity),
     ),
     Padding(
      padding: EdgeInsets.all(8),
      child: Column(
       crossAxisAlignment:
CrossAxisAlignment.start,
       children: [
        Text(tagline, style:
TextStyle(fontWeight: FontWeight.bold,
fontSize: 14)),
        SizedBox(height: 5),
        Text(description, style:
TextStyle(fontSize: 12, color: Colors.grey)),
       ],
      ),
     ),
    ],
   ),
  );
 }
}
```

category.dart file

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

class CategoriesPage extends
StatelessWidget {
 @override
 Widget build(BuildContext context) {
  return DefaultTabController(
    length: 4,
    child: Scaffold(
      appBar: AppBar(
        title: Text('Categories'),
        actions: [
          IconButton(icon: Icon(Icons.search),
onPressed: () {}),
          IconButton(icon:
Icon(Icons.notifications), onPressed: () {}),
        ],
        bottom: TabBar(
          tabs: [
            Tab(text: 'Women'),
            Tab(text: 'Men'),
            Tab(text: 'Kids'),
            Tab(text: 'Home'),
          ],
        ),
      ),
      body: Column(
        children: [
          SizedBox(height: 20),
          SingleChildScrollView(
            scrollDirection: Axis.horizontal,
            child: Row(
              children: [
                _buildCategoryIcon('Sale 50%
Off', Icons.local_offer),
                _buildCategoryIcon('Trending',
Icons.trending_up),
                _buildCategoryIcon('New
Arrivals', Icons.new_releases),
                _buildCategoryIcon('Exclusive
Brands', Icons.store),
              ],
            ),
          ),
          Divider(),
          Expanded(
            child: ListView(
              children: [
                _buildCategoryItem(context,
'Indianwear', 'assets/indianwear.png'),
                _buildCategoryItem(context,
'Westernwear', 'assets/westernwear.png'),
                _buildCategoryItem(context,
'Jewellery', 'assets/jewellery.png'),
                _buildCategoryItem(context,
'Watches', 'assets/watches.png'),
                _buildCategoryItem(context,
'Footwear', 'assets/footwear.png'),
                _buildCategoryItem(context,
'Bags', 'assets/bags.png'),
              ],
            ),
          ),
        ],
      ),
      bottomNavigationBar:
BottomNavigationBar(
        currentIndex: 1,
        selectedItemColor: Colors.black,
        unselectedItemColor: Colors.grey,
        backgroundColor: Colors.white,
        showUnselectedLabels: true,
        type: BottomNavigationBarType.fixed,
        items: [
          BottomNavigationBarItem(icon:
Icon(Icons.home), label: 'Home'),
          BottomNavigationBarItem(icon:
Icon(Icons.category), label: 'Categories'),
          BottomNavigationBarItem(icon:
Icon(Icons.style), label: 'Stay Stylish'),
          BottomNavigationBarItem(icon:
Icon(Icons.account_circle), label: 'Account'),
        ],
      ),
    ),
  );
}

 Widget _buildCategoryIcon(String label,
IconData icon) {
  return Padding(
```

```dart
      padding: const
EdgeInsets.symmetric(horizontal: 10),
    child: Column(
      children: [
        CircleAvatar(
          backgroundColor:
Colors.grey.shade200,
          child: Icon(icon, color: Colors.black),
        ),
        SizedBox(height: 5),
        Text(label, textAlign: TextAlign.center,
style: TextStyle(fontSize: 12)),
      ],
    ),
  );
}

 Widget _buildCategoryItem(BuildContext
context, String label, String imagePath) {
  return ListTile(
    contentPadding:
EdgeInsets.symmetric(vertical: 10,
horizontal: 20),
    leading: Image.asset(imagePath, width:
70, height: 70),
    title: Text(
      label,
      style: TextStyle(fontSize: 15),
    ),
    trailing: Icon(Icons.arrow_forward_ios,
size: 20),
    onTap: () {
      Navigator.push(
        context,
        MaterialPageRoute(
          builder: (context) =>
IndianwearPage(), // Ensure
`IndianwearPage` is defined in
`product.dart`
        ),
      );
    },
  );
}
}
```

product.dart file

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

void main() {
 runApp(MyApp());
}

final List<Map<String, String>>
productDetails = [
 {"name": "Sancia women ethnic palazzo
set", "price": "₹2,500", "image":
"assets/palazzo.png", "rating": "4.5"},
 {"name": "Indya peach embroided net
Anarkali", "price": "₹5,000", "image":
"assets/anarkali.png", "rating": "4.7"},
 {"name": "Dori pink Women wear Salwar
Suit", "price": "₹1,200", "image":
"assets/salwar.png", "rating": "4.3"},
 {"name": "Sareeka Pink net lehenga choli",
"price": "₹800", "image":
"assets/lehenga.png", "rating": "4.0"},
];

class MyApp extends StatelessWidget {
 @override
 Widget build(BuildContext context) {
  return MaterialApp(
    debugShowCheckedModeBanner: false,
    home: IndianwearPage(),
  );
 }
}

class IndianwearPage extends
StatelessWidget {
 @override
 Widget build(BuildContext context) {
  return Scaffold(
    appBar: AppBar(
     backgroundColor: Colors.white,
     elevation: 0,
     title: Text(
       "Indianwear",
       style: TextStyle(color: Colors.black,
fontSize: 20),
     ),
     leading: IconButton(
       icon: Icon(Icons.arrow_back, color:
Colors.black),
       onPressed: () =>
Navigator.pop(context),
     ),
     actions: [
      IconButton(
        icon: Icon(Icons.filter_list, color:
Colors.black),
        onPressed: () {
         // Add filter functionality
        },
      ),
     ],
    ),
    body: CustomScrollView(
     slivers: [
      SliverPadding(
        padding:
EdgeInsets.symmetric(horizontal: 5, vertical:
5),
        sliver: SliverGrid(
         delegate:
SliverChildBuilderDelegate(
             (BuildContext context, int index)
{
             return ProductCard(
              name:
productDetails[index]["name"]!,
              price:
productDetails[index]["price"]!,
              image:
productDetails[index]["image"]!,
              rating:
productDetails[index]["rating"]!,
             );
           },
           childCount: productDetails.length,
         ),
         gridDelegate:
SliverGridDelegateWithFixedCrossAxisCou
nt(
           crossAxisCount: 2,
           mainAxisSpacing: 2,
           crossAxisSpacing: 2,
           childAspectRatio: 0.55,
         ),
```

```dart
        ),
      ),
    ],
  ),
  bottomNavigationBar:
BottomNavigationBar(
    currentIndex: 0,
    selectedItemColor: Colors.black,
    unselectedItemColor: Colors.grey,
    backgroundColor: Colors.white,
    showUnselectedLabels: true,
    type: BottomNavigationBarType.fixed,
    onTap: (index) {
      // Add navigation functionality if
needed
    },
    items: [
      BottomNavigationBarItem(icon:
Icon(Icons.home), label: 'Home'),
      BottomNavigationBarItem(icon:
Icon(Icons.category), label: 'Categories'),
      BottomNavigationBarItem(icon:
Icon(Icons.style), label: 'Stay Stylish'),
      BottomNavigationBarItem(icon:
Icon(Icons.account_circle), label: 'Account'),
    ],
  ),
  );
 }
}

class ProductCard extends StatelessWidget
{
 final String name;
 final String price;
 final String image;
 final String rating;

 const ProductCard({
   required this.name,
   required this.price,
   required this.image,
   required this.rating,
});

 @override
 Widget build(BuildContext context) {
   return GestureDetector(
     onTap: () {

      // Navigate to the ProductDetailPage
      Navigator.push(
        context,
        MaterialPageRoute(
          builder: (context) =>
ProductDetailPage(
            name: name,
            price: price,
            image: image,
            rating: rating,
          ),
        ),
      );
    },
    child: Card(
      elevation: 3,
      shape:
RoundedRectangleBorder(borderRadius:
BorderRadius.circular(10)),
      child: Column(
        crossAxisAlignment:
CrossAxisAlignment.start,
        children: [
          // Product Image with Heart Icon &
Quick View Button
          Stack(
            children: [
              ClipRRect(
                borderRadius:
BorderRadius.vertical(top:
Radius.circular(10)),
                child: Image.asset(
                  image,
                  width: double.infinity,
                  height: 220,  // Increased image
height
                  fit: BoxFit.cover,
                ),
              ),
              // Heart Icon
              Positioned(
                top: 8,
                right: 8,
                child: Container(
                  decoration: BoxDecoration(
                    color:
Colors.white.withOpacity(0.7),
                    shape: BoxShape.circle,
                  ),
```

```dart
        child: IconButton(
          icon:
Icon(Icons.favorite_border, color:
Colors.black),
          onPressed: () {
            // Add to wishlist functionality
          },
        ),
      ),
    ),
    // Quick View Button
    Positioned(
      bottom: 8,
      left: 8,
      child: Container(
        padding:
EdgeInsets.symmetric(vertical: 3, horizontal:
10),
        decoration: BoxDecoration(
          color:
Colors.white.withOpacity(0.8),
          borderRadius:
BorderRadius.circular(5),
        ),
        child: Text(
          "Quick View",
          style: TextStyle(fontSize: 12,
fontWeight: FontWeight.bold),
        ),
      ),
    ),
  ],
),
// Wrap the Column with a Flexible
widget to allow ListView
Flexible(
  fit: FlexFit.tight,
  child: ListView(
    padding: EdgeInsets.all(8),
    shrinkWrap: true,  // Ensures
ListView doesn't take more space than
needed
    physics:
NeverScrollableScrollPhysics(),  // Disables
scrolling inside the ListView
    children: [
      Text(name, style:
TextStyle(fontSize: 10, fontFamily:
"Poppins")),
      SizedBox(height: 4),
      Row(
        children: [
          Icon(Icons.star, color:
Colors.orange, size: 14),
          SizedBox(width: 4),
          Text(rating, style:
TextStyle(fontSize: 10, color:
Colors.black87)),
        ],
      ),
      SizedBox(height: 4),
      Text(price, style:
TextStyle(fontSize: 11, color: Colors.black,
fontWeight: FontWeight.bold, fontFamily:
"Poppins")),
    ],
  ),
),
      ],
    ),
  );
}
}
```
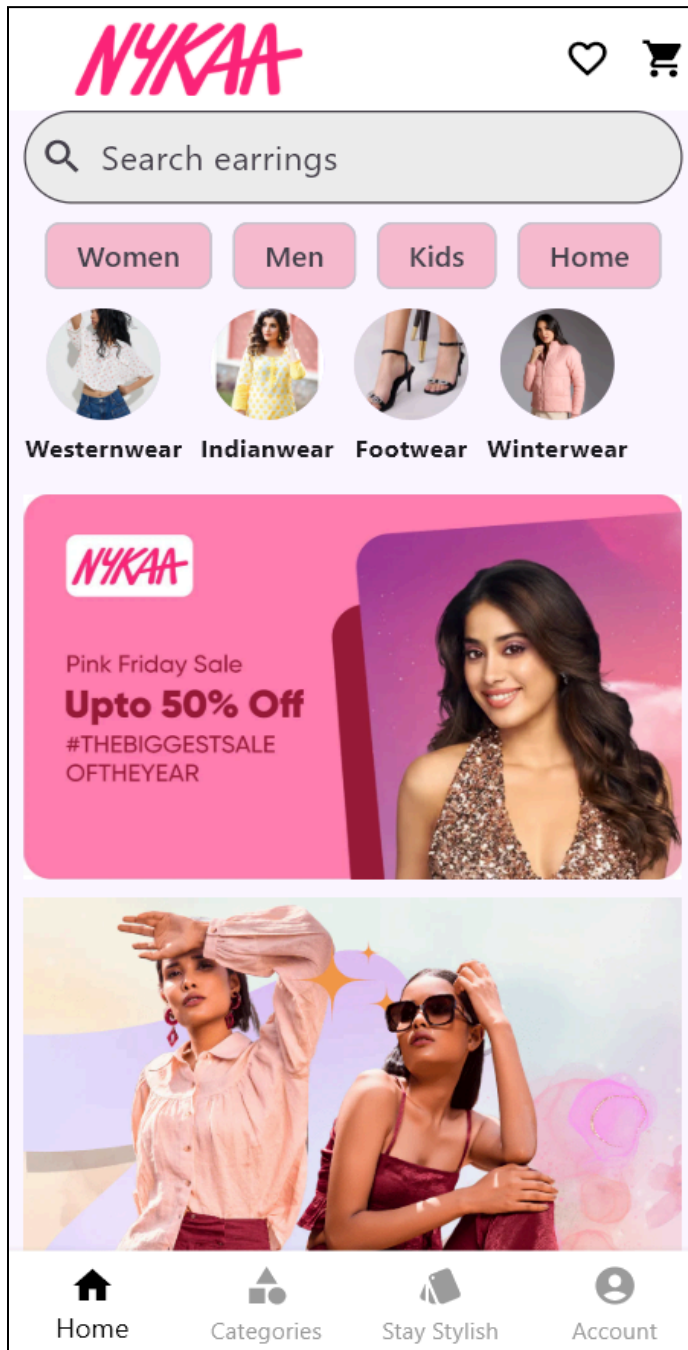
Output:

After clicking category in bottom navbar it will navigate to category.dart page
And
After clicking shopping cart icon in topbar it will redirect to bag.dart page

ⓘ Flat discount on UPI payment

🚚 Check Delivery Date | Enter Pincode

U.S. POLO ASSN. ✕
Light Blue High Rise Pleated Wide Leg...
Size 28
₹1820 ~~₹2799~~ 35% off
7 day return

Aldo ✕
Iconispeca-In009 Women Black Sneake...
Size UK 3
₹0 ~~₹0~~
7 day return

You will save ₹6,978 on this purchase.

₹7,849
View Details | Proceed to Buy

Women | Men | Kids | Home

🏷️ Sale 50% Off | 📈 Trending | ❗ New Arrivals | 🏪 Exclusive Brand

Indianwear ›

Westernwear ›

Jewellery ›

Watches ›

Footwear ›

Bags ›

🏠 Home | ◣● Categories | Stay Stylish | 👤 Account

After clicking on Indian wear from above categories page it will redirect to product.dart page
And
After clicking on product card it will redirect to ProductDetailPage.dart page