MPL EXP 5

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

Theory:

1. Navigation & Routing

Navigation in Flutter allows users to move between different screens (pages). Flutter uses the Navigator widget to manage screen transitions.

- Named Routes: Uses predefined route names for navigation.
- Push & Pop Navigation: Uses Navigator.push() to move forward and Navigator.pop() to go back.

2. Gestures in Flutter

Flutter provides the GestureDetector widget to detect user interactions like taps, swipes, pinches, and long presses.

		-
Widget	Description	Properties
Navigator	Manages app navigation	push(), pop()
MaterialPageRoute	Defines a new screen transition	builder, settings
GestureDetector	Detects user gestures	onTap, onLongPress, onPanUpdate
InkWell	Detects tap gestures with visual feedback	onTap, borderRadius
WillPopScore	Handles back navigation behavior	onWillPop

Syntax for Navigation & Routing

1. Basic Navigation Using Navigator.push() & pop()

```
Navigator.push(
   context,
   MaterialPageRoute(builder: (context) => SecondScreen()),
);
```

To go back:

Navigator.pop(context);

2. Named Routes Navigation (Define in main.dart)

dart

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```
void main() {
 runApp(MaterialApp(
  initialRoute: '/',
  routes: {
   '/': (context) => HomeScreen(),
   '/second': (context) => SecondScreen(),
  },
 ));
Navigate using:
Navigator.pushNamed(context, '/second');
Syntax for Gestures in Flutter
1. GestureDetector for Tap and Double Tap
GestureDetector(
 onTap: () {
  print('Single tap detected');
 },
 onDoubleTap: () {
  print('Double tap detected');
 },
 child: Container(
  width: 100,
  height: 100,
  color: Colors.blue,
 ),
2. InkWell for Clickable Widgets with Ripple Effect
InkWell(
 onTap: () {
  print('InkWell tapped');
 },
 child: Padding(
  padding: EdgeInsets.all(10),
  child: Text('Tap Me'),
 ),
)
Full Example: Navigation & Gestures in Flutter
dart
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import 'package:flutter/material.dart';
```

```
void main() {
 runApp(MyApp());
class MyApp extends StatelessWidget {
 @override
 Widget build(BuildContext context) {
  return MaterialApp(
   debugShowCheckedModeBanner: false,
   initialRoute: '/',
   routes: {
    '/': (context) => HomeScreen(),
    '/second': (context) => SecondScreen(),
   },
  );
}
class HomeScreen extends StatelessWidget {
 @override
 Widget build(BuildContext context) {
  return Scaffold(
   appBar: AppBar(title: Text('Home Screen')),
   body: Center(
    child: Column(
      mainAxisAlignment: MainAxisAlignment.center,
      children: [
       // Navigate to Second Screen
       ElevatedButton(
        onPressed: () {
         Navigator.pushNamed(context, '/second');
        },
        child: Text('Go to Second Screen'),
       ),
       SizedBox(height: 20),
       // GestureDetector Example
       GestureDetector(
        onTap: () {
         print('Box tapped');
        },
        onDoubleTap: () {
```

```
print('Box double tapped');
        },
        child: Container(
          width: 100,
          height: 100,
          color: Colors.blue,
          child: Center(child: Text('Tap Me')),
        ),
class SecondScreen extends StatelessWidget {
 @override
 Widget build(BuildContext context) {
  return Scaffold(
   appBar: AppBar(title: Text('Second Screen')),
   body: Center(
     child: ElevatedButton(
      onPressed: () {
       Navigator.pop(context);
      },
      child: Text('Go Back'),
    ),
   ),
  );
Code:
homepage.dart
import 'package:flutter/material.dart';
import 'package:google fonts/google fonts.dart';
import 'package:blinkit/screens/categories.dart';
void main() {
 runApp(BlinkitClone());
}
class BlinkitClone extends StatelessWidget {
```

```
@override
 Widget build(BuildContext context) {
  return MaterialApp(
   debugShowCheckedModeBanner: false,
   initialRoute: '/home',
   routes: {
    '/home': (context) => HomePage(),
    '/categories': (context) => CategoriesScreen(),
   },
  );
}
class HomePage extends StatefulWidget {
 @override
 _HomePageState createState() => _HomePageState();
class _HomePageState extends State<HomePage> {
 int selectedIndex = 0;
 void _onItemTapped(int index) {
  if (index == 2) {
   Navigator.pushNamed(context, '/categories');
  } else {
   setState(() {
    _selectedIndex = index;
   });
  }
 }
 @override
 Widget build(BuildContext context) {
  return Scaffold(
   backgroundColor: Colors.white,
   bottomNavigationBar: BottomNavigationBar(
    currentIndex: selectedIndex,
    selectedItemColor: Colors.green,
    unselectedItemColor: Colors.black,
    showUnselectedLabels: true,
    onTap: _onItemTapped,
    items: [
      BottomNavigationBarItem(icon: Icon(Icons.home), label: "Home"),
      BottomNavigationBarItem(
```

```
icon: Icon(Icons.shopping bag), label: "Order Again"),
  BottomNavigationBarItem(
     icon: lcon(lcons.category), label: "Categories"),
  BottomNavigationBarItem(icon: Icon(Icons.print), label: "Print"),
 ],
),
body: SingleChildScrollView(
 child: Column(
  crossAxisAlignment: CrossAxisAlignment.start,
  children: [
   Container(
     color: Colors.yellow[700],
     padding: const EdgeInsets.only(
       top: 50, left: 16, right: 16, bottom: 10),
     child: Column(
      crossAxisAlignment: CrossAxisAlignment.start,
      children: [
       Row(
        children: [
          Icon(Icons.timer, color: Colors.black),
          const SizedBox(width: 5),
          Text(
           "Blinkit in",
           style: GoogleFonts.poppins(
              fontSize: 14, fontWeight: FontWeight.w500),
          ),
          const SizedBox(width: 5),
          Text(
           "10 minutes",
           style: GoogleFonts.poppins(
              fontSize: 18, fontWeight: FontWeight.bold),
          ),
          Spacer(),
          lcon(lcons.shopping_cart, color: Colors.black),
          const SizedBox(width: 10),
          CircleAvatar(
           backgroundColor: Colors.white,
           child: Icon(Icons.person, color: Colors.black),
          ),
        ],
       const SizedBox(height: 5),
       Text(
        "HOME - Ria Chaudhari, 202, Coral Nirmal ▼",
```

```
style: GoogleFonts.poppins(
       fontSize: 14, fontWeight: FontWeight.w500),
   ),
   const SizedBox(height: 10),
   Container(
     padding: EdgeInsets.symmetric(horizontal: 10),
     decoration: BoxDecoration(
      color: Colors.white,
      borderRadius: BorderRadius.circular(10),
     ),
     child: Row(
      children: [
       Icon(Icons.search, color: Colors.black54),
       Expanded(
        child: TextField(
          decoration: InputDecoration(
           hintText: "Search 'cookies'",
           border: InputBorder.none,
           contentPadding:
              EdgeInsets.symmetric(vertical: 10),
          ),
         ),
       ),
       Icon(Icons.mic, color: Colors.black54),
      ],
   ),
  ],
 ),
),
Container(
 padding: EdgeInsets.symmetric(vertical: 10),
 child: Row(
  mainAxisAlignment: MainAxisAlignment.spaceEvenly,
  children: [
   _CategoryItem(icon: Icons.shopping_bag, label: "All"),
   _CategoryItem(icon: Icons.favorite, label: "Weddings"),
   _CategoryItem(icon: Icons.tv, label: "Electronics"),
   _CategoryItem(icon: Icons.brush, label: "Beauty"),
   _CategoryItem(icon: Icons.child_care, label: "Kids"),
   _CategoryItem(icon: Icons.card_giftcard, label: "Gifting"),
  ],
 ),
),
```

```
Container(
 padding: EdgeInsets.all(16),
 decoration: BoxDecoration(
  color: Colors.yellow[100],
  borderRadius: BorderRadius.circular(10),
 ),
 child: Column(
  children: [
   Text("Welcome",
      style: GoogleFonts.poppins(
         fontSize: 22, fontWeight: FontWeight.bold)),
   Text("Order now to avail exciting offers!",
      style: GoogleFonts.poppins(fontSize: 14)),
   Row(
     mainAxisAlignment: MainAxisAlignment.spaceEvenly,
     children: [
      Text("Flat ₹50 OFF",
         style: GoogleFonts.poppins(
           fontSize: 16,
           fontWeight: FontWeight.bold,
           color: Colors.green)),
      Text("+", style: GoogleFonts.poppins(fontSize: 20)),
      Text("Free Delivery",
         style: GoogleFonts.poppins(
           fontSize: 16,
           fontWeight: FontWeight.bold,
           color: Colors.green)),
    ],
   ),
  ],
 ),
),
Padding(
 padding: const EdgeInsets.symmetric(horizontal: 16),
 child: Text(
  "Bestsellers",
  style: GoogleFonts.poppins(
     fontSize: 18, fontWeight: FontWeight.bold),
 ),
),
GridView.count(
 padding: const EdgeInsets.all(16),
 crossAxisCount: 3,
 shrinkWrap: true,
```

```
physics: NeverScrollableScrollPhysics(),
        children: [
          _BestsellerItem(image: "assets/onion.jpg", count: "+135 more"),
          _BestsellerItem(
            image: "assets/oranges.jpg", count: "+320 more"),
           BestsellerItem(image: "assets/lays.jpg", count: "+23 more"),
          BestsellerItem(
            image: "assets/fortune.jpg", count: "+137 more"),
          _BestsellerItem(image: "assets/sprite.jpg", count: "+114 more"),
          BestsellerItem(
            image: "assets/parle_g.jpg", count: "+135 more"),
        ],
       ),
class _CategoryItem extends StatelessWidget {
 final IconData icon;
 final String label;
 CategoryItem({required this.icon, required this.label});
 @override
 Widget build(BuildContext context) {
  return Column(
   children: [
     Icon(icon, size: 28, color: Colors.black),
     Text(label, style: GoogleFonts.poppins(fontSize: 12)),
   ],
  );
}
class BestsellerItem extends StatelessWidget {
 final String image;
 final String count;
 BestsellerItem({required this.image, required this.count});
 @override
 Widget build(BuildContext context) {
  return Column(
```

```
children: [
     Image.asset(image, height: 50, fit: BoxFit.cover),
     Text(count, style: GoogleFonts.poppins(fontSize: 12)),
   ],
  );
}
categories.dart
import 'package:flutter/material.dart';
class CategoriesScreen extends StatelessWidget {
 @override
 Widget build(BuildContext context) {
  return Scaffold(
   backgroundColor: Colors.white,
   appBar: AppBar(
     backgroundColor: Colors.amber.shade100,
     elevation: 0,
     title: Column(
      crossAxisAlignment: CrossAxisAlignment.start,
      children: [
       Text(
         "Blinkit in",
        style: TextStyle(fontSize: 14, color: Colors.black54),
       ),
       Text(
        "11 minutes",
        style: TextStyle(fontSize: 20, fontWeight: FontWeight.bold, color:
Colors.black),
       ),
       Text(
         "HOME - Ria Chaudhari, 202, Coral Nirmal ▼",
        style: TextStyle(fontSize: 14, color: Colors.black54),
       ),
      ],
     ),
     actions: [
      IconButton(
       icon: Icon(Icons.card_giftcard, color: Colors.black),
       onPressed: () {},
      ),
      IconButton(
       icon: Icon(Icons.person, color: Colors.black),
```

```
onPressed: () {},
      ),
    ],
   ),
   body: Column(
     children: [
      Padding(
       padding: const EdgeInsets.all(10.0),
       child: TextField(
        decoration: InputDecoration(
          hintText: 'Search "gifts",
          prefixIcon: Icon(Icons.search, color: Colors.black54),
          suffixIcon: Icon(Icons.mic, color: Colors.black54),
          filled: true,
          fillColor: Colors.white,
          border: OutlineInputBorder(
           borderRadius: BorderRadius.circular(10),
           borderSide: BorderSide.none,
          ),
        ),
       ),
      ),
      Expanded(
       child: SingleChildScrollView(
        child: Padding(
          padding: const EdgeInsets.all(10.0),
          child: Column(
           crossAxisAlignment: CrossAxisAlignment.start,
           children: [
            buildCategorySection(context, "Grocery & Kitchen", [
              {"name": "Vegetables & Fruits", "image":
"assets/vegetables fruits.png"},
              {"name": "Atta, Rice & Dal", "image": "assets/atta rice dal.png"},
              {"name": "Oil, Ghee & Masala", "image": 'assets/oil ghee masala.jpg'},
              {"name": "Dairy, Bread & Eggs", "image":
"assets/dairy bread eggs.png"},
             {"name": "Bakery & Biscuits", "image": "assets/bakery_biscuits.png"},
              {"name": "Dry Fruits & Cereals", "image":
"assets/dry_fruits_cereals.png"},
              {"name": "Chicken, Meat & Fish", "image":
"assets/chicken_meat_fish.png"},
             {"name": "Kitchenware & Appliances", "image":
"assets/kitchenware appliances.png"},
            1),
```

```
buildCategorySection(context, "Snacks & Drinks", [
             {"name": "Chips & Namkeen", "image": "assets/chips namkeen.png"},
             {"name": "Sweets & Chocolates", "image":
"assets/sweets chocolates.png"},
             {"name": "Drinks & Juices", "image": "assets/drinks juices.png"},
             {"name": "Tea, Coffee & Milk Drinks", "image":
"assets/tea coffee milk.png"},
             {"name": "Instant Food", "image": "assets/instant_food.png"},
             {"name": "Sauces & Spreads", "image": "assets/sauces spreads.png"},
             {"name": "Paan Corner", "image": "assets/paan_corner.png"},
             {"name": "Ice Creams & Desserts", "image":
"assets/icrecream desserts.png"},
            1),
           ],
         ),
      ),
      Container(
       padding: EdgeInsets.all(10),
       color: Colors.blue.shade100,
       child: Row(
        mainAxisAlignment: MainAxisAlignment.center,
        children: [
          Icon(Icons.delivery dining, color: Colors.blue.shade800),
          SizedBox(width: 5),
          Text("Get FREE delivery", style: TextStyle(fontWeight: FontWeight.bold,
color: Colors.blue.shade800)),
          SizedBox(width: 5),
          Text("on all orders above ₹149", style: TextStyle(color: Colors.black54)),
        ],
       ),
    ],
   ),
  );
 Widget buildCategorySection(BuildContext context, String title, List<Map<String,
String>> categories) {
  return Column(
   crossAxisAlignment: CrossAxisAlignment.start,
   children: [
    SizedBox(height: 10),
```

```
Text(
 title.
 style: TextStyle(fontSize: 18, fontWeight: FontWeight.bold),
),
GridView.builder(
 shrinkWrap: true,
 physics: NeverScrollableScrollPhysics(),
 gridDelegate: SliverGridDelegateWithFixedCrossAxisCount(
  crossAxisCount: 4,
  crossAxisSpacing: 10,
  mainAxisSpacing: 10,
  childAspectRatio: 0.8,
 ),
 itemCount: categories.length,
 itemBuilder: (context, index) {
  return GestureDetector(
   onTap: () {
     if (categories[index]["name"] == "Bakery & Biscuits") {
      Navigator.pushNamed(context, '/bakery_biscuits');
    }
   },
   child: Column(
     children: [
      Container(
       height: 60,
       width: 60,
       decoration: BoxDecoration(
         color: Colors.grey.shade200,
         borderRadius: BorderRadius.circular(10),
         image: DecorationImage(
          image: AssetImage(categories[index]["image"]!),
          fit: BoxFit.cover,
         ),
       ),
      ),
      SizedBox(height: 5),
      Text(
       categories[index]["name"]!,
       textAlign: TextAlign.center,
       style: TextStyle(fontSize: 12),
      ),
    ],
  );
```

```
},
   ],
bakery_biscuits.dart
import 'package:flutter/material.dart';
import 'package:provider/provider.dart';
import 'package:blinkit/providers/cart provider.dart';
class BakeryBiscuitsPage extends StatelessWidget {
 final List<Product> products = [
  Product(name: 'Sunfeast Baked Creations Walnut & Choco Chip Cookies',
imageUrl: 'assets/sunfeast _cookies.png', price: 134.0),
  Product(name: 'Hide & Seek Chocolate Chip Cookies (100 g)', imageUrl:
'assets/hide seek 100.png', price: 29.0),
  Product(name: 'Hide & Seek Chocolate Chip Cookies (200 g)', imageUrl:
'assets/hide seek 200.png', price: 45.0),
  Product(name: 'Britannia Good Day Cashew Biscuit', imageUrl:
'assets/brittania goodday.png', price: 49.0),
 ];
 @override
 Widget build(BuildContext context) {
  return Scaffold(
   appBar: AppBar(
    backgroundColor: Colors.amber.shade100,
    elevation: 0,
    title: Text(
      "Bakery & Biscuits",
      style: TextStyle(fontSize: 20, fontWeight: FontWeight.bold, color: Colors.black),
    ),
    leading: IconButton(
      icon: Icon(Icons.arrow back, color: Colors.black),
      onPressed: () => Navigator.pop(context),
    ),
   ),
   body: Row(
    children: [
      // Sidebar with categories and images
      Container(
       width: 100,
```

```
color: Colors.white,
       child: ListView(
        children: [
          CategoryTile(label: 'Cookies', image: 'assets/cookies.png', isSelected:
true),
          CategoryTile(label: 'Cream Biscuits', image: 'assets/cream biscuits.png'),
          CategoryTile(label: 'Healthy & Digestive', image:
'assets/healthy digestive.png'),
          CategoryTile(label: 'Sweet & Salty', image: 'assets/sweet salty.png'),
          CategoryTile(label: 'Glucose & Marie', image: 'assets/glucose marie.png'),
          CategoryTile(label: 'Rusks & Wafers', image: 'assets/rusks wafers.png'),
          CategoryTile(label: 'Cakes & Rolls', image: 'assets/cakes rolls.png'),
          CategoryTile(label: 'Baking Ingredients', image:
'assets/baking ingredients.png'),
        ],
       ),
      ),
      // V Products grid
      Expanded(
       child: Column(
        children: [
          Expanded(
           child: GridView.builder(
             padding: EdgeInsets.all(8),
            gridDelegate: SliverGridDelegateWithFixedCrossAxisCount(
              crossAxisCount: 2,
              crossAxisSpacing: 10,
              mainAxisSpacing: 10,
              childAspectRatio: 0.7,
            ),
            itemCount: products.length,
             itemBuilder: (context, index) {
              return ProductTile(product: products[index]);
            },
           ),
          ),
          buildCartButton(context), // V Floating cart button at bottom
       ),
```

```
/// V Floating Cart Button
 Widget buildCartButton(BuildContext context) {
  return Consumer<CartProvider>(
   builder: (context, cart, child) {
     return cart.cartItems.isNotEmpty
       ? Container(
          padding: EdgeInsets.all(10),
          color: Colors.green,
          width: double.infinity,
          child: Row(
           mainAxisAlignment: MainAxisAlignment.spaceBetween,
           children: [
            Text("${cart.cartItems.length} items in cart",
               style: TextStyle(color: Colors.white, fontSize: 16)),
             ElevatedButton(
              style: ElevatedButton.styleFrom(backgroundColor: Colors.white),
              onPressed: () {
               Navigator.pushNamed(context, '/checkout'); // V Navigate to
Checkout Page
              child: Text("View Cart", style: TextStyle(color: Colors.green)),
            ),
           ],
          ),
       : SizedBox();
   },
  );
 }
class CategoryTile extends StatelessWidget {
 final String label;
 final String image;
 final bool isSelected;
 CategoryTile({required this.label, required this.image, this.isSelected = false});
 @override
 Widget build(BuildContext context) {
  return Padding(
   padding: const EdgeInsets.symmetric(vertical: 8.0),
   child: Column(
```

```
children: [
      Container(
       height: 50,
       width: 50,
       decoration: BoxDecoration(
        borderRadius: BorderRadius.circular(10),
        image: DecorationImage(
          image: AssetImage(image),
          fit: BoxFit.cover,
        ),
       ),
      ),
      SizedBox(height: 5),
      Text(
       label,
       textAlign: TextAlign.center,
       style: TextStyle(
        color: isSelected ? Colors.green : Colors.black,
        fontWeight: isSelected ? FontWeight.bold : FontWeight.normal,
       ),
      ),
    ],
  );
class ProductTile extends StatelessWidget {
 final Product product;
 ProductTile({required this.product});
 @override
 Widget build(BuildContext context) {
  return Card(
   shape: RoundedRectangleBorder(borderRadius: BorderRadius.circular(10)),
   child: Column(
     crossAxisAlignment: CrossAxisAlignment.start,
     children: [
      Expanded(
       child: Image.asset(
        product.imageUrl,
        fit: BoxFit.cover,
        width: double.infinity,
```

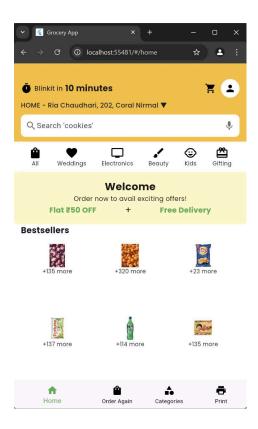
```
),
      ),
      Padding(
       padding: const EdgeInsets.all(8.0),
       child: Text(
        product.name,
        style: TextStyle(fontWeight: FontWeight.bold),
       ),
      ),
      Padding(
       padding: const EdgeInsets.symmetric(horizontal: 8.0),
       child: Row(
        mainAxisAlignment: MainAxisAlignment.spaceBetween,
        children: [
          Text(
           '₹${product.price}',
           style: TextStyle(color: Colors.green, fontWeight: FontWeight.bold),
          ElevatedButton(
           onPressed: () {
            Provider.of<CartProvider>(context, listen: false)
               .addToCart(product.name, product.price);
           },
           child: Text('ADD'),
          ),
class Product {
 final String name;
 final String imageUrl;
 final double price;
 Product({required this.name, required this.imageUrl, required this.price});
}
checkout.dart
import 'package:flutter/material.dart';
```

```
import 'package:provider/provider.dart';
import 'package:blinkit/providers/cart provider.dart';
class CheckoutPage extends StatelessWidget {
 @override
 Widget build(BuildContext context) {
  final cart = Provider.of<CartProvider>(context);
  return Scaffold(
   appBar: AppBar(
     title: Text("Checkout"),
     backgroundColor: Colors.white,
     actions: [
      IconButton(icon: Icon(Icons.share, color: Colors.green), onPressed: () {}),
     ],
   ),
   body: Column(
     children: [
      Container(
       padding: EdgeInsets.all(10),
       child: Row(
         children: [
          Icon(Icons.timer, color: Colors.green),
          SizedBox(width: 5),
          Text("Free delivery in 10 minutes", style: TextStyle(fontWeight:
FontWeight.bold)),
        ],
       ),
      ),
      Expanded(
       child: ListView.builder(
         itemCount: cart.cartItems.length,
         itemBuilder: (context, index) {
          final item = cart.cartItems[index];
          return ListTile(
           title: Text(item["name"]),
           trailing: Text("₹${item["price"]}", style: TextStyle(color: Colors.green)),
          );
        },
       ),
      Container(
       padding: EdgeInsets.all(10),
       color: Colors.white,
```

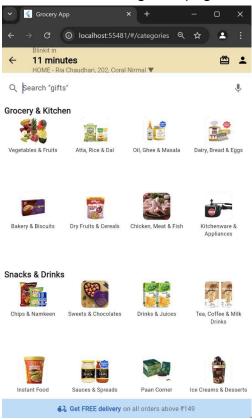
```
child: Column(
 children: [
  ListTile(
   title: Text("Total Amount"),
   trailing: Text("₹${cart.totalAmount}",
      style: TextStyle(fontSize: 18, fontWeight: FontWeight.bold)),
  ),
  ElevatedButton(
   style: ElevatedButton.styleFrom(backgroundColor: Colors.green),
   onPressed: () {
    cart.clearCart(); // Clear cart after placing order
     Navigator.pop(context);
   },
   child: Padding(
     padding: const EdgeInsets.all(12.0),
    child: Text("Place Order",
       style: TextStyle(color: Colors.white, fontSize: 18)),
```

Output:

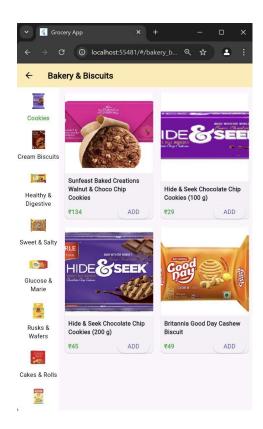
This is the homepage.



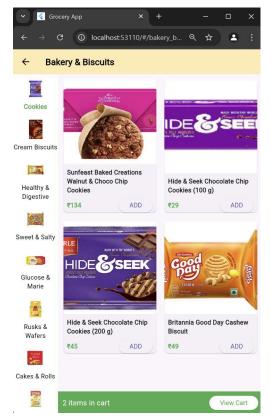
When the user clicks on categories icon at the bottom of the screen it will navigate the user to the categories page.



When the user clicks on Bakery and Biscuits under Grocery and Kitchen section it will navigate the user to bakery and biscuits section.



When the user clicks on 'Add' button on an item it will show a floating cart at the bottom of the screen.



When the user clicks on View Cart at the bottom of the screen it will show the user all the products the user has added into the cart along with the total amount the user has to pay and thus navigate to the checkout page.

