

## Experiment 05

Name	Roshan Bhagtani
Roll no.	4
Class	D15C
DOP	
DOS	
Grade	
Sign	

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

**Theory:**

### 1. Navigation and Routing:

Flutter provides robust mechanisms for in-app navigation through both **named routes** and **direct route (MaterialPageRoute)** instantiation. Navigation in Flutter is managed by the `Navigator` widget, which maintains a stack-based history of route objects. The `Navigator.push()` and `Navigator.pop()` methods are used to transition between screens (routes) and to handle the back-stack.

- **Basic Navigation:** Using `Navigator.push(context, MaterialPageRoute(builder: (context) => SecondScreen()))` to navigate between widgets.

**Named Routes:** Defined in the `MaterialApp` widget via the `routes` parameter, allowing clean separation and easier route management, e.g.,

```
routes: {  
  
  '/': (context) => HomePage(),  
  
  '/login': (context) => LoginPage(),  
  
}
```

### 2. Gesture Detection

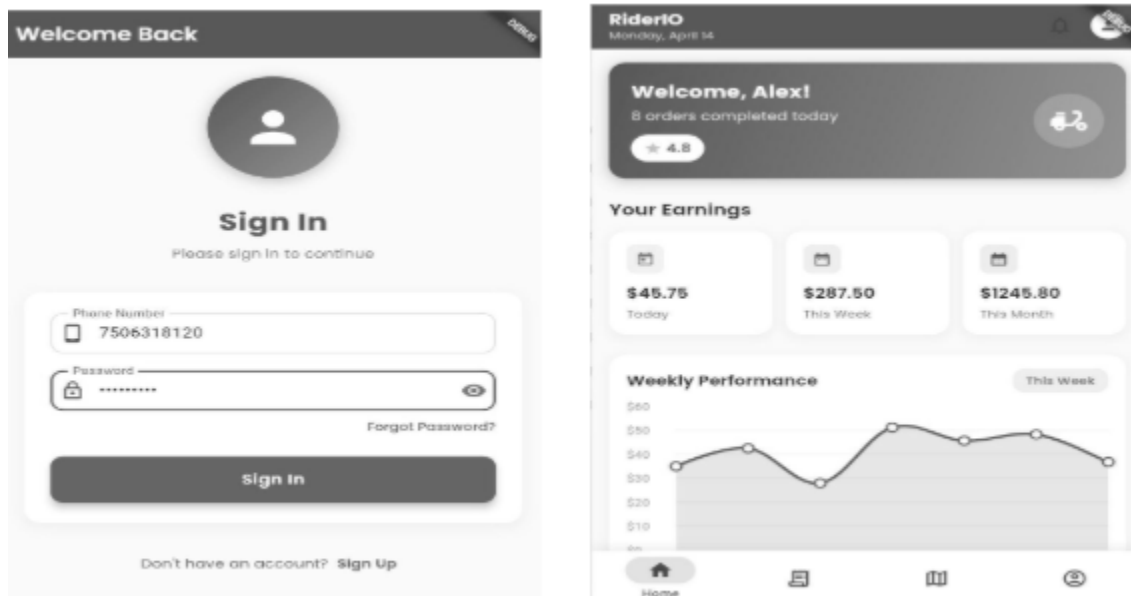
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Flutter's gesture detection is powered by the **gesture arena** system. The `GestureDetector` widget plays a central role in listening to user touch events and mapping them to appropriate callbacks like `onTap`, `onDoubleTap`, `onLongPress`, `onPan`, and `onVerticalDrag`.

For more advanced gesture recognition, Flutter provides other widgets such as:

- `InkWell`: Material design widget that provides visual feedback (ripple effect) on taps.
- `Dismissible`: Handles swipe-to-dismiss behavior.
- `Draggable` and `DragTarget`: Used for building drag-and-drop interfaces.

### Output:



### Conclusion:

The LoginScreen efficiently combines a user-friendly interface, smooth transitions, and secure authentication with Firebase Firestore. The use of animations enhances the user experience, providing a polished look and feel. The form validation ensures data integrity, while error handling with snack bars provides clear feedback. The routing mechanism enables seamless navigation between the login screen and other sections of the app, such as the home and signup screens. Overall, the implementation of these features creates a secure, interactive, and aesthetically pleasing login flow for users.

