# Experiment 2

**Aim:** To design Flutter UI by including common widgets.

**Theory:**

Flutter is a UI toolkit developed by Google for building natively compiled applications for mobile, web, and desktop from a single codebase. Flutter uses widgets as the basic building blocks for creating user interfaces. Widgets describe what the UI should look like based on their current configuration and state.

Types of Widgets in Flutter

Flutter widgets can be categorized into two main types:

1. Stateless Widgets
   a. These widgets do not store any state and remain static.
   b. They are immutable and cannot change during runtime.
   c. Example: Text, Icon, Container.
2. Stateful Widgets
   a. These widgets can maintain state and update dynamically.
   b. They are mutable and can change based on user interactions or data changes.
   c. Example: Checkbox, TextField, Slider.

Common Flutter Widgets Used in UI Design

| **Widget** | **Description** |
|---|---|
| `Scaffold` | Provides a basic app structure with app bars, drawers, and bottom navigation. |
| `AppBar` | Displays a toolbar at the top of the screen with titles and actions. |
| `Text` | Displays a string of text with single or multiple styles. |
| `Container` | A rectangular box that can be styled with padding, margin, borders, and background colors. |
| `Row` & `Column` | Used for horizontal (`Row`) and vertical (`Column`) layouts. |

| | |
|---|---|
| ListView | A scrollable list of widgets arranged linearly. |
| TextField | Allows user input with keyboard interactions. |
| Button (ElevatedButton, TextButton, IconButton) | Interactive elements for triggering actions. |
| Image | Displays an image from assets or network. |
| Card | A material design card with rounded corners and elevation. |

**Codes:**

1. Scaffold

```
return Scaffold(
  appBar: _currentIndex == 0
      ? AppBar(
          elevation: 0,
          backgroundColor: Colors.white,
          centerTitle: false,
          toolbarHeight: 100,
          leadingWidth: 100,
          title: Row(
            children: [
              Image.asset('assets/images/nbaLogo.png', height: 50),
              const SizedBox(width: 8),
              const Text('NBA', style: TextStyle(color: Colors.black, fontSize: 24, fontWeight:
FontWeight.bold)),
            ],
          ),
          actions: [
            IconButton(
              icon: const Icon(Icons.more_horiz, color: Colors.black),
              onPressed: () {},
            ),
          ],
        )
      : null,
  body: _pages[_currentIndex],
  bottomNavigationBar: BottomNavigationBar(
    currentIndex: _currentIndex,
    onTap: _onItemTapped,
    items: const [
      BottomNavigationBarItem(icon: Icon(Icons.home), label: 'Home'),
      BottomNavigationBarItem(icon: Icon(Icons.score), label: 'Score'),
      BottomNavigationBarItem(icon: Icon(Icons.person), label: 'Profile'),
    ],
  ),
);
```

## 2. Row & Column

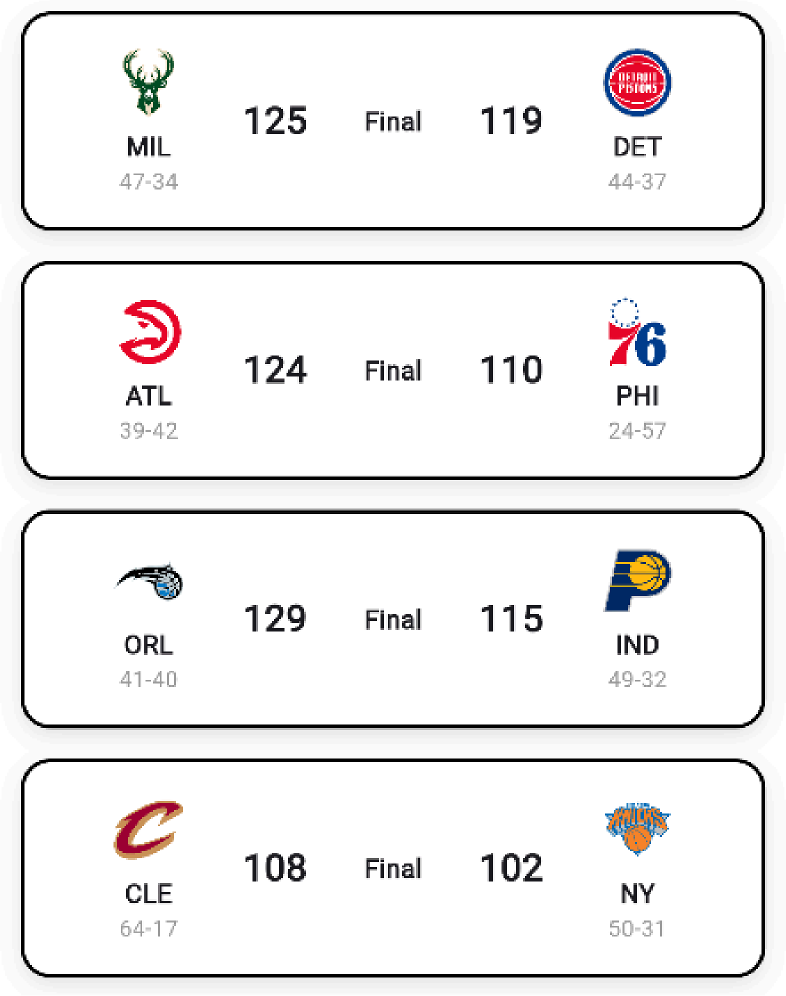
```
Row(
  mainAxisAlignment: MainAxisAlignment.spaceEvenly,
  children: [
    Column(
      children: [
        awayLogoUrl != null
            ? Image.network(awayLogoUrl, height: 40, width: 40)
            : const Icon(Icons.image_not_supported, size: 40),
        const SizedBox(height: 4),
        Text(awayTeam, style: const TextStyle(fontWeight: FontWeight.bold)),
        Text(awayRecord, style: const TextStyle(fontSize: 12, color: Colors.grey)),
      ],
    ),
    awayScoreWidget,
    middleWidget,
    homeScoreWidget,
    Column(
      children: [
        homeLogoUrl != null
            ? Image.network(homeLogoUrl, height: 40, width: 40)
            : const Icon(Icons.image_not_supported, size: 40),
        const SizedBox(height: 4),
        Text(homeTeam, style: const TextStyle(fontWeight: FontWeight.bold)),
        Text(homeRecord, style: const TextStyle(fontSize: 12, color: Colors.grey)),
      ],
    ),
  ],
)
```

## 3. Container

```
Container(
  height: 300,
  decoration: BoxDecoration(
    color: Colors.white,
    borderRadius: BorderRadius.circular(16),
    boxShadow: [
      BoxShadow(
        color: Colors.grey,
        blurRadius: 8,
        offset: const Offset(0, 4),
      ),
    ],
  ),
  child: Column(...)
)
```

4. ListView

```
ListView.builder(
  shrinkWrap: true,
  physics: const NeverScrollableScrollPhysics(),
  itemCount: sortedGames.length,
  itemBuilder: (context, index) {
    final gameEntry = sortedGames[index];
    return GestureDetector(
      onTap: () => Navigator.push(...),
      child: ScoreCard(...),
    );
  },
)
```



MIL 47-34 125 Final 119 DET 44-37

ATL 39-42 124 Final 110 PHI 24-57

ORL 41-40 129 Final 115 IND 49-32

CLE 64-17 108 Final 102 NY 50-31

**Github link:** https://github.com/Rakshit5467/NBA-India

**Conclusion:**

This experiment demonstrated the effective use of common Flutter widgets such as Scaffold, Row, Column, Container, and ListView to design a structured and interactive UI. By implementing these widgets, we learned how to create responsive layouts, manage navigation, and display dynamic content, reinforcing the importance of widgets as fundamental building blocks in Flutter app development. The practical application of these concepts helps in developing visually appealing and functional user interfaces efficiently.