

Experiment No. 2

AIM : To design Flutter UI by including common widgets

Theory:

In Flutter, designing UIs involves combining various widgets to build interactive and visually appealing applications. Here's a more detailed overview of key concepts:

1. **Widgets in Flutter:** Everything in Flutter is a widget. Widgets are the building blocks of the UI. There are two main types:
 - **Stateless Widgets:** These are immutable and don't change over time. They are responsible for displaying UI based on fixed data or input.
 - **Stateful Widgets:** These can change their state over time. They are dynamic and are used when the UI needs to update in response to user interaction or other factors.
2. **Layout Widgets:** The layout of your UI is primarily constructed using widgets like:
 - **Container:** A versatile widget used to hold other widgets and apply styling such as padding, margin, colors, and shapes.
 - **Column:** A widget that arranges its children vertically. It's useful for stacking widgets in a vertical list.
 - **Row:** A widget that arranges its children horizontally. It's useful for placing widgets side by side.
 - **Expanded:** A widget that can be used inside a Column, Row, or Flex to make child widgets flexible and fill available space.
3. **Text and Icons:**
 - **Text:** The Text widget is used to display static or dynamic text. It can be styled with custom fonts, sizes, colors, and more.
 - **Icon:** Flutter provides a large set of material design icons, and the Icon widget lets you display them in various sizes and colors.
4. **Buttons and User Interactions:**
 - Flutter provides multiple button widgets like **ElevatedButton**, **TextButton**, and **IconButton** to handle user interaction. These widgets can trigger actions when tapped.
 - **TextField:** Used for user input. You can configure it to accept different types of text, such as email or password.

- **Checkbox, Radio, and Switch:** Used for boolean selections, allowing users to choose options in forms or settings.

5. **Navigation:**

- Flutter's **Navigator** widget is responsible for managing routes or screens. You use `Navigator.push` to navigate to a new screen, and `Navigator.pop` to return to the previous one.
- **Routes** define the pages of an app, and you can pass data between them using arguments.

6. **Displaying Lists and Grids:**

- **ListView:** The `ListView` widget is used to display a list of items that can scroll. It's perfect for long lists that need to be dynamically generated.
- **GridView:** This widget allows you to display items in a grid format, with configurable row and column layouts.

7. **State Management:**

- Flutter provides a variety of ways to manage state. The simplest approach is using `setState()` to update the UI. For more complex apps, you can use state management solutions like **Provider**, **Riverpod**, or **Bloc** to separate business logic from UI code.
- Proper state management ensures your UI stays in sync with the underlying data, especially in interactive or dynamic applications.

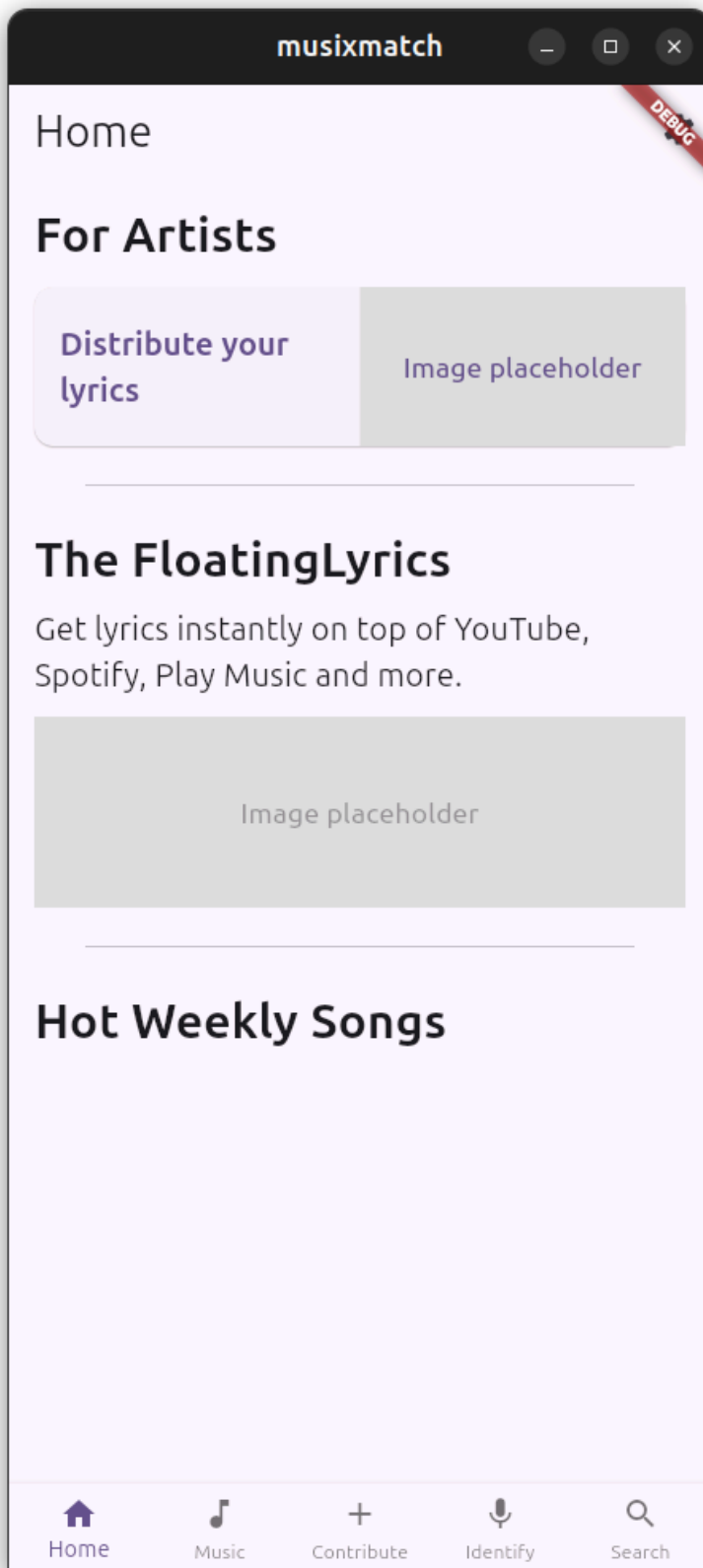
8. **Theming and Styling:**

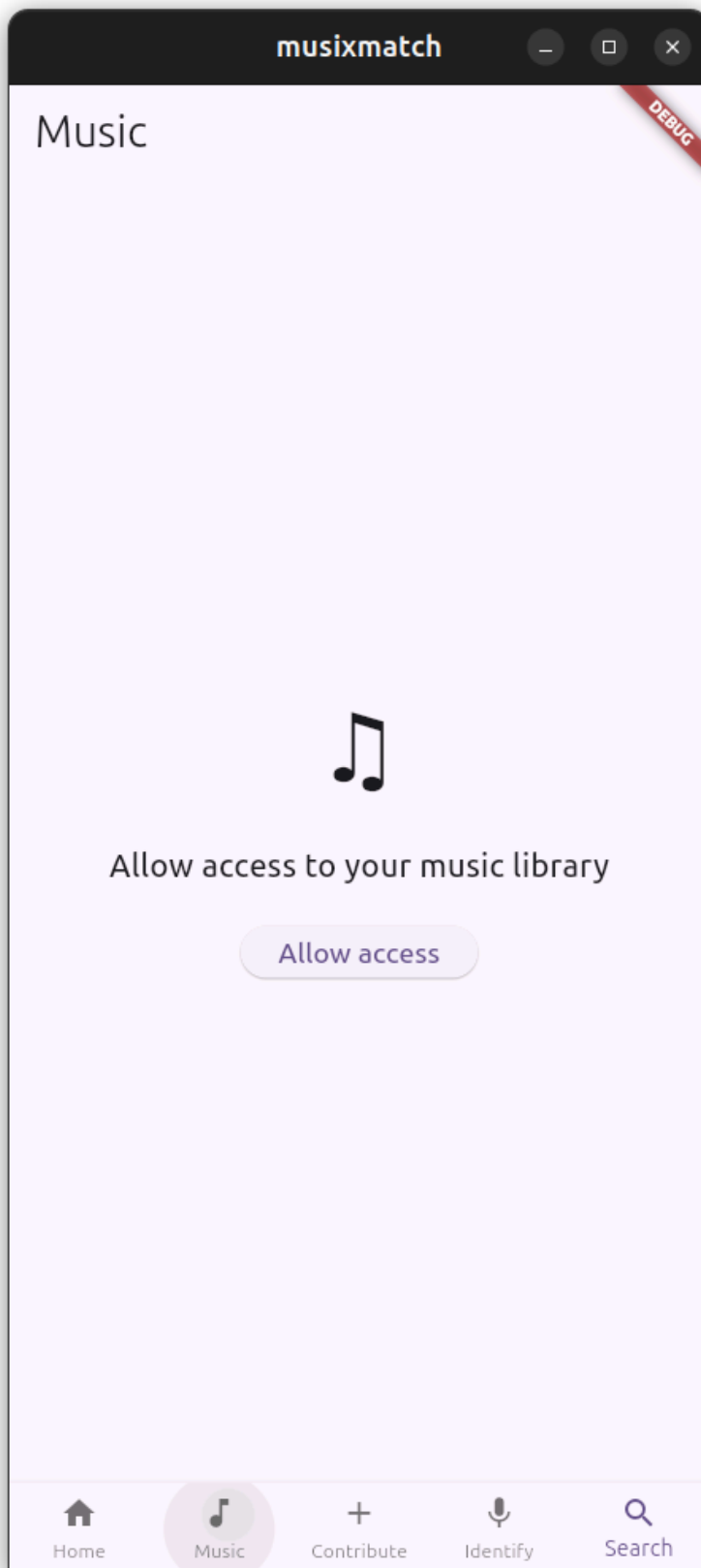
- Flutter allows you to define a global **Theme** for your app using `ThemeData`, which ensures consistent styling across the entire app. You can customize colors, typography, and button styles.

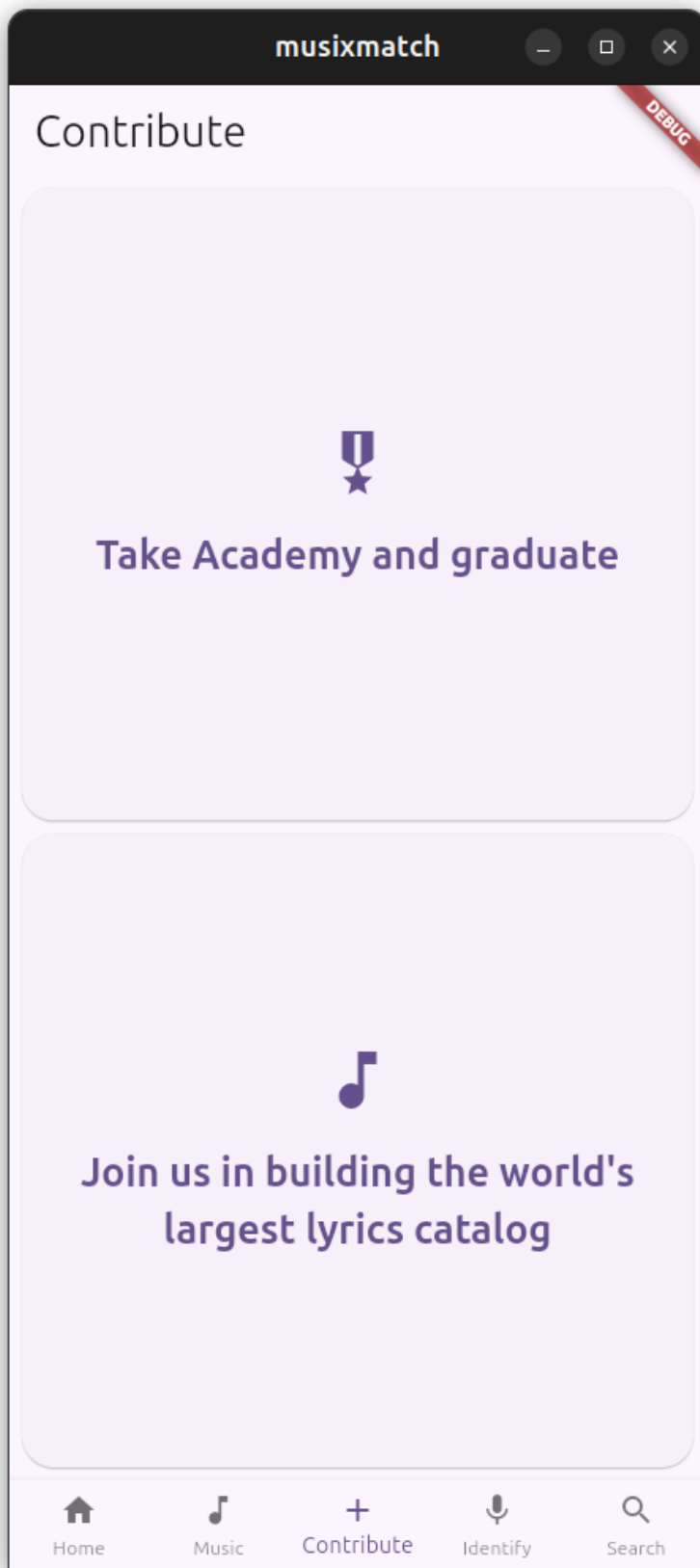
9. **Animations and Transitions:**

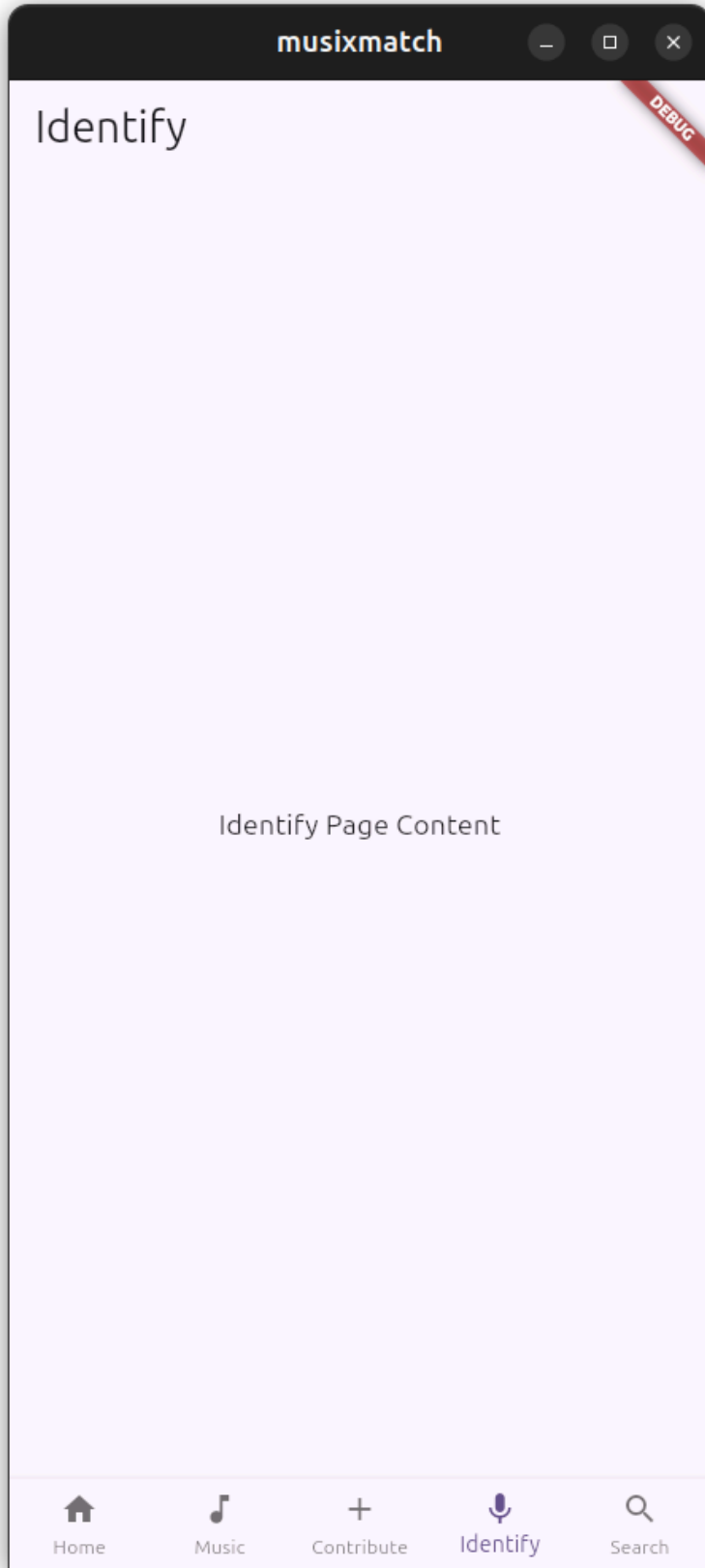
- Flutter provides powerful animation support to create smooth and visually appealing transitions between UI states.
- **AnimatedContainer:** A widget that animates changes in properties like width, height, or color over a given duration.
- You can also create custom animations using **AnimationController** and **Tween**.

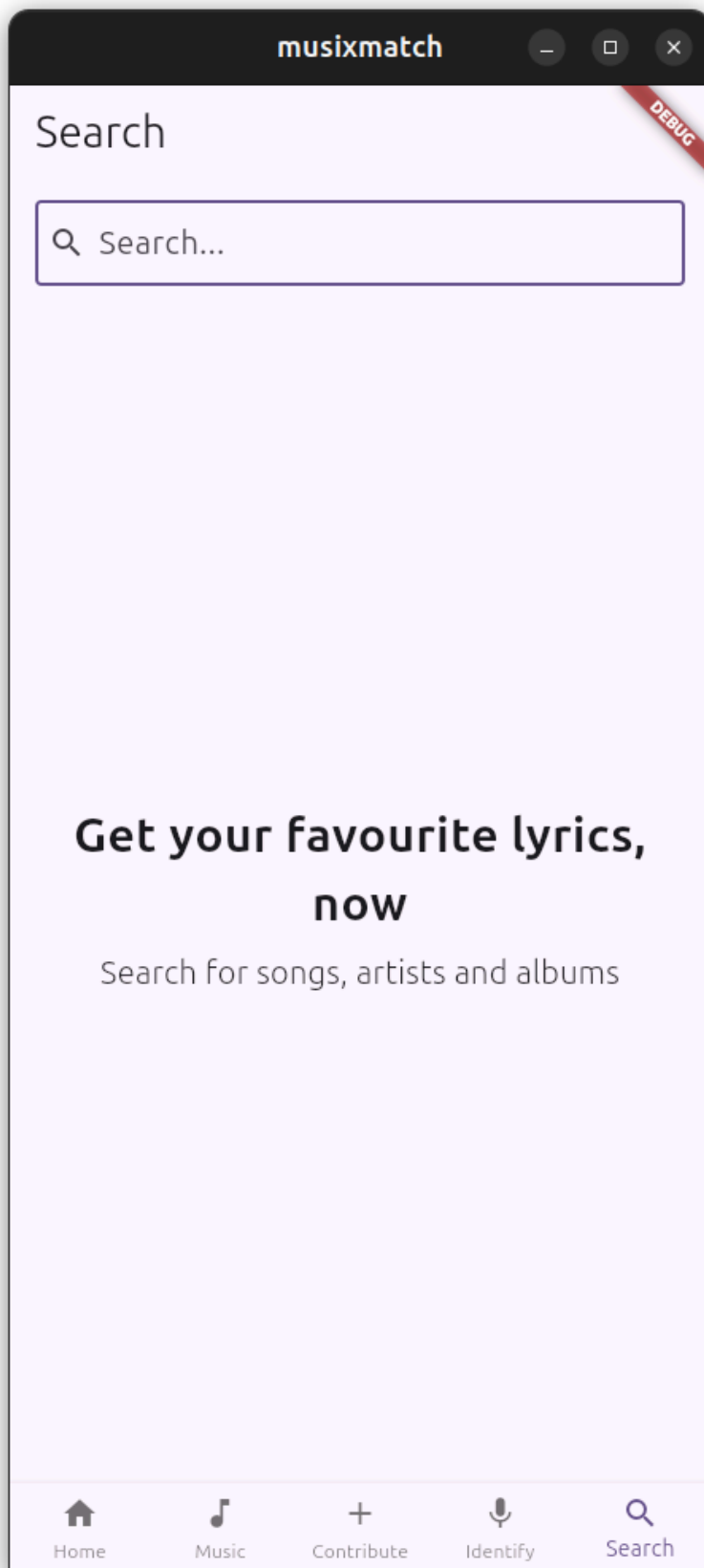
Screenshots:











Code Snippets:

main.dart

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

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

class MyApp extends StatelessWidget {
  const MyApp({super.key});

  @override
  Widget build(BuildContext context) {
    return MaterialApp(
      title: 'Musixmatch',
      theme: ThemeData(
        colorScheme:
ColorScheme.fromSeed(seedColor:
Colors.deepPurple),
        useMaterial3: true,
      ),
      home: const MainScreen(),
    );
  }
}
```


home_page.dart

```

import 'package:flutter/material.dart';
import 'package:url_launcher/url_launcher.dart';
import 'settings_page.dart';

class HomePage extends StatelessWidget {
  const HomePage({super.key});

  Future<void> _launchDistributeLyrics() async {
    final Uri url = Uri.parse('https://t.musixmatch.com/pro/distribute-lyrics-spotify-instagram');
    if (!await launchUrl(url, mode: LaunchMode.externalApplication)) {
      throw Exception('Could not launch $url');
    }
  }

  @override
  Widget build(BuildContext context) {
    return Scaffold(
      appBar: AppBar(
        title: const Text('Home'),
        actions: [
          IconButton(
            icon: const Icon(Icons.settings),
            onPressed: () {
              Navigator.push(
                context,
                MaterialPageRoute(
                  builder: (context) => const SettingsPage(),
                ),
              );
            },
          ),
        ],
      ),
      body: SingleChildScrollView(
        child: Padding(
          padding: const EdgeInsets.symmetric(horizontal: 16.0),
          child: Column(
            crossAxisAlignment: CrossAxisAlignment.start,
            children: [
              const SizedBox(height: 16),
              // First Section
              const Text(
                'For Artists',
                style: TextStyle(
                  fontSize: 24,
                  fontWeight: FontWeight.bold,
                ),
              ),
              const SizedBox(height: 12),
              SizedBox(

```

```

height: 100,
child: ElevatedButton(
  onPressed: _launchDistributeLyrics,
  style: ElevatedButton.styleFrom(
    padding: EdgeInsets.zero,
    shape: RoundedRectangleBorder(
      borderRadius: BorderRadius.circular(12),
    ),
  ),
child: Row(
  children: [
    Expanded(
      flex: 1,
      child: Padding(
        padding: const EdgeInsets.all(16.0),
        child: Text(
          'Distribute your lyrics',
          style: TextStyle(
            fontSize: 16,
            fontWeight: FontWeight.bold,
          ),
        ),
      ),
    ),
    Expanded(
      flex: 1,
      child: Container(
        // Placeholder for image
        color: Colors.grey.shade300,
        child: Center(
          child: Text('Image placeholder'),
        ),
      ),
    ),
  ],
),
),
),

// Divider
Padding(
  padding: const EdgeInsets.symmetric(vertical: 24.0, horizontal: 32.0),
  child: Divider(height: 1, thickness: 1),
),

// Second Section
const Text(
  'The FloatingLyrics',
  style: TextStyle(
    fontSize: 24,
    fontWeight: FontWeight.bold,
  ),
),

```

```

    ),
    const SizedBox(height: 8),
    const Text(
      'Get Lyrics instantly on top of YouTube, Spotify, Play Music and more.',
      style: TextStyle(
        fontSize: 16,
      ),
    ),
    const SizedBox(height: 12),
    SizedBox(
      height: 120,
      width: double.infinity,
      child: ElevatedButton(
        onPressed: null, // No action for now
        style: ElevatedButton.styleFrom(
          padding: EdgeInsets.zero,
          shape: RoundedRectangleBorder(
            borderRadius: BorderRadius.circular(12),
          ),
        ),
      ),
    ),
    child: Container(
      // Placeholder for image
      color: Colors.grey.shade300,
      child: Center(
        child: Text('Image placeholder'),
      ),
    ),
  ),
),
),
),

// Divider
Padding(
  padding: const EdgeInsets.symmetric(vertical: 24.0, horizontal: 32.0),
  child: Divider(height: 1, thickness: 1),
),

// Third Section
const Text(
  'Hot Weekly Songs',
  style: TextStyle(
    fontSize: 24,
    fontWeight: FontWeight.bold,
  ),
),
const SizedBox(height: 100), // Empty space for future content
],
),
),
),
),
);
}
}

```

navigation_bar.dart

```

import 'package:flutter/material.dart';
import 'pages/home_page.dart';
import 'pages/music_page.dart';
import 'pages/contribute_page.dart';
import 'pages/identify_page.dart';
import 'pages/search_page.dart';

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

  @override
  State<MainScreen> createState() => _MainScreenState();
}

class _MainScreenState extends State<MainScreen> {
  int _selectedIndex = 0;

  final List<Widget> _pages = [
    const HomePage(),
    const MusicPage(),
    const ContributePage(),
    const IdentifyPage(),
    const SearchPage(),
  ];

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

  @override
  Widget build(BuildContext context) {
    return Scaffold(
      body: _pages[_selectedIndex],
      bottomNavigationBar: BottomNavigationBar(
        type: BottomNavigationBarType.fixed,
        currentIndex: _selectedIndex,
        onTap: _onItemTapped,
        items: const [
          BottomNavigationBarItem(
            icon: Icon(Icons.home),

```

```
        label: 'Home',
      ),
      BottomNavigationBarItem(
        icon: Icon(Icons.music_note),
        label: 'Music',
      ),
      BottomNavigationBarItem(
        icon: Icon(Icons.add),
        label: 'Contribute',
      ),
      BottomNavigationBarItem(
        icon: Icon(Icons.mic),
        label: 'Identify',
      ),
      BottomNavigationBarItem(
        icon: Icon(Icons.search),
        label: 'Search',
      ),
    ],
  ),
);
}
```