Flutter Fundamentals
Complete application

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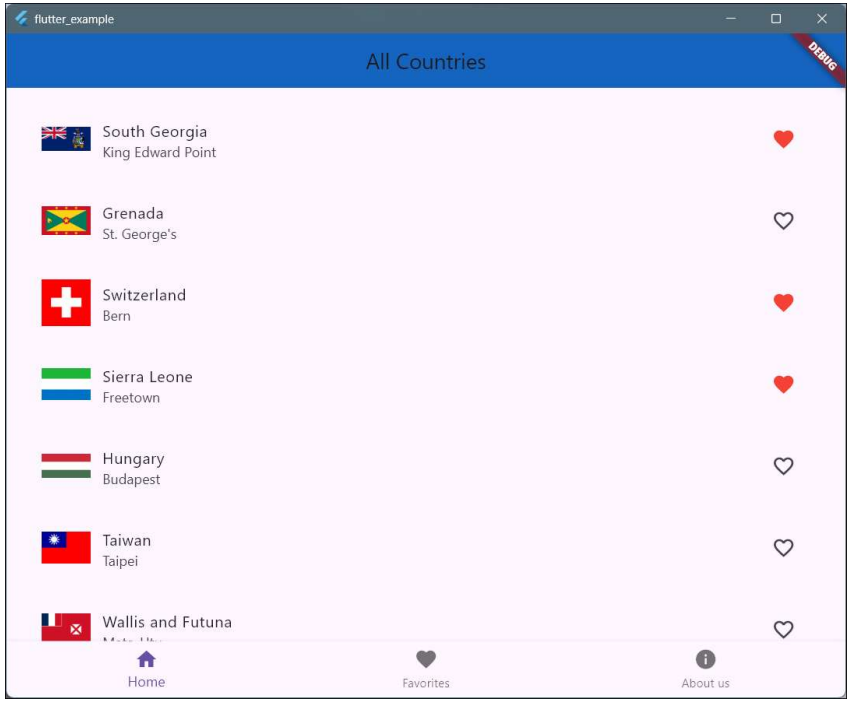
Complete application

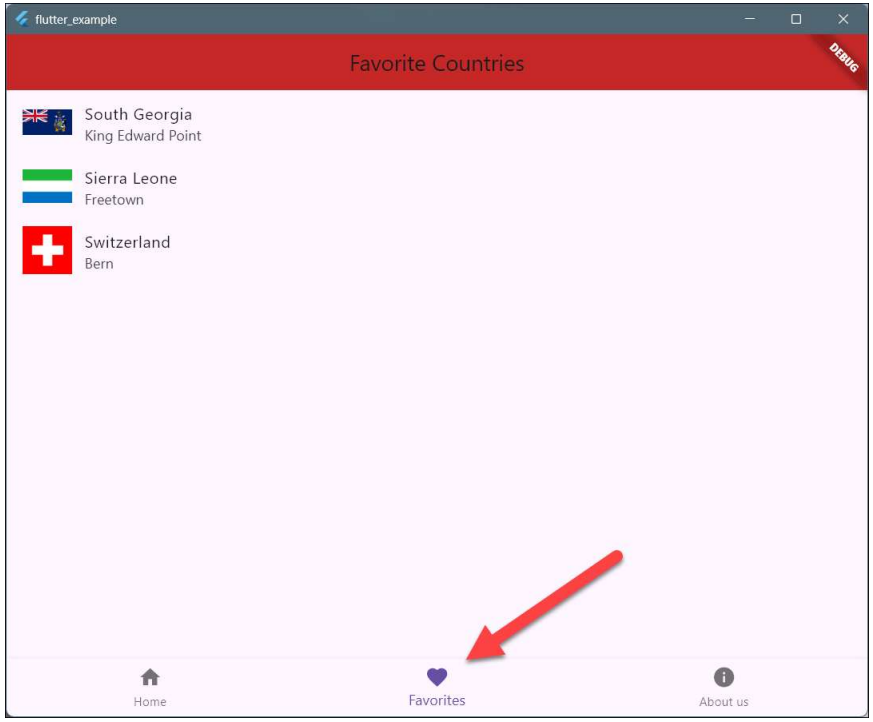
A complete application, using http for communication, putting results in a bloc store and using bottom navigation

Requirements

1. A complete application, using `http` for communication to fetch countries
2. Put fetched countries in a bloc / state management store
3. Show a list of fetched countries
4. Mark a country as Favorite/Unfavorite
5. Show a list of favored countries
6. Show an About us page
7. Use a BottomNavigationBar to switch between screens

Visual Result





1. update `CountriesBloc`

Starting point: `_430-payload`, fetching a list of countries and putting it in the store

- First: extend the bloc to listen to a `ToggleFavorite` event

```
class CountriesBloc extends Bloc<CountriesEvent, CountriesState> {
  CountriesBloc() : super(CountriesInitial()) {
    // 1. Listen to the FetchCountries event.
    on<FetchCountries>((event, emit) async {}

    // 2. Listen to the ToggleFavorite event
    on<ToggleFavorite>((event, emit){}
}
```

Event `ToggleFavorite` in `CountriesBloc`

- Approach: check if a country exists in the array `favorites` and add/remove it
- Then, emit the new state with
  - Countries
  - Favorites

```dart
on<ToggleFavorite>((ToggleFavorite event, Emitter<CountriesState> emit){
  if (state is CountriesLoaded) {
    final currentState = state as CountriesLoaded;
    final favorites = List<Map<String, dynamic>>.from(currentState.favorites);

    // 5. Check if the country exists
    final bool existingCountry = favorites.any(
          (country) =>
      country['name']['common'] == event.country['name']['common'],
    );

    // 6. Toggle favorite
    if (existingCountry != false) {
      favorites.remove(event.country); // Remove from favorites
    } else {
      favorites.add(event.country); // Add to favorites
    }

    // 7. Emit new state
    emit(
      CountriesLoaded(
        countries: currentState.countries,
        favorites: favorites,
      ),
    );
  }
});
```

2. Update CountriesEvent

- Extend `countries_event.dart`
- Add an event to toggle the favorite state:

```dart
// …
class FetchCountries extends CountriesEvent {}

// 3. Event: marking a country as Favorite. The list consists
// of a Map<String, dynamic>, containing a list of favorite countries.
class ToggleFavorite extends CountriesEvent {
  final Map<String, dynamic>country;

  ToggleFavorite({required this.country});

  @override
  List<Object?> get props => [country];
}
```

3. Update CountriesState

The class `CountriesState` represents all possible states of `CountriesBloc`

- Add the list of favorites to the `CountriesState` class
- Also return the list of `favorites`!

Code for `countries_events.dart`

```
…
// 2. The initial state
class CountriesInitial extends CountriesState {}


…
// State property to hold the successfully fetched list of countries.
// 4. It is now extended with a list of favorite countries.
class CountriesLoaded extends CountriesState {
  final List countries;
  final List favorites;

  // constructor, using named properties here
  CountriesLoaded({required this.countries, required this.favorites});

  // 5. When getting the state, return countries AND favorites.
  @override
  List<Object?> get props => [countries, favorites];
}
…
```

4. Update All Countries screen

Updating the Home Screen, containing all countries (`home_countries.dart`)

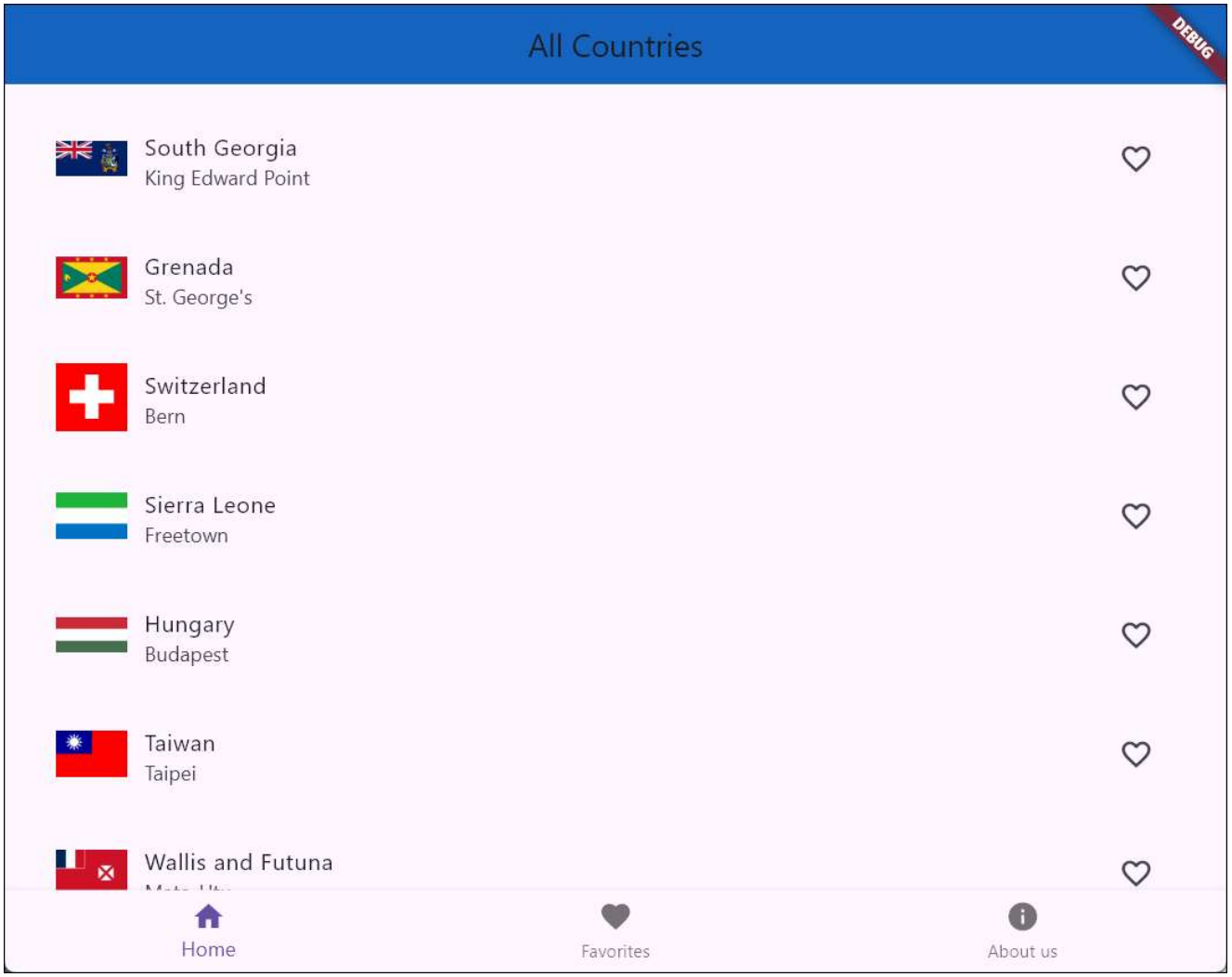
- Major change: add a `trailing` icon to toggle the favorite state
- On pressing the `Favorite` icon, emit the `ToggleFavorite()` event for the current country
- We can (still) use a `StatelessWidget()` for this.

Code for `countries_home.dart`

```
// abstract…
itemBuilder: (BuildContext context, int index) {
  final country = state.countries[index];
  final isFavorite = state.favorites.contains(country);

  // 6. Every list item wrapped in a Padding() widget.
  return Padding(
   …
          // 8. A trailing button to toggle the 'Favorite' state
          trailing: IconButton(
            icon: Icon(
              isFavorite ? Icons.favorite : Icons.favorite_border,
              color: isFavorite ? Colors.red : null,
            ),
            onPressed: () {
              // 9. Emit event if the Favorite state is toggled.
              context.read<CountriesBloc>().add(
                ToggleFavorite(country: country),
              );
            },
   …
```

Visual for `countries_home.dart`



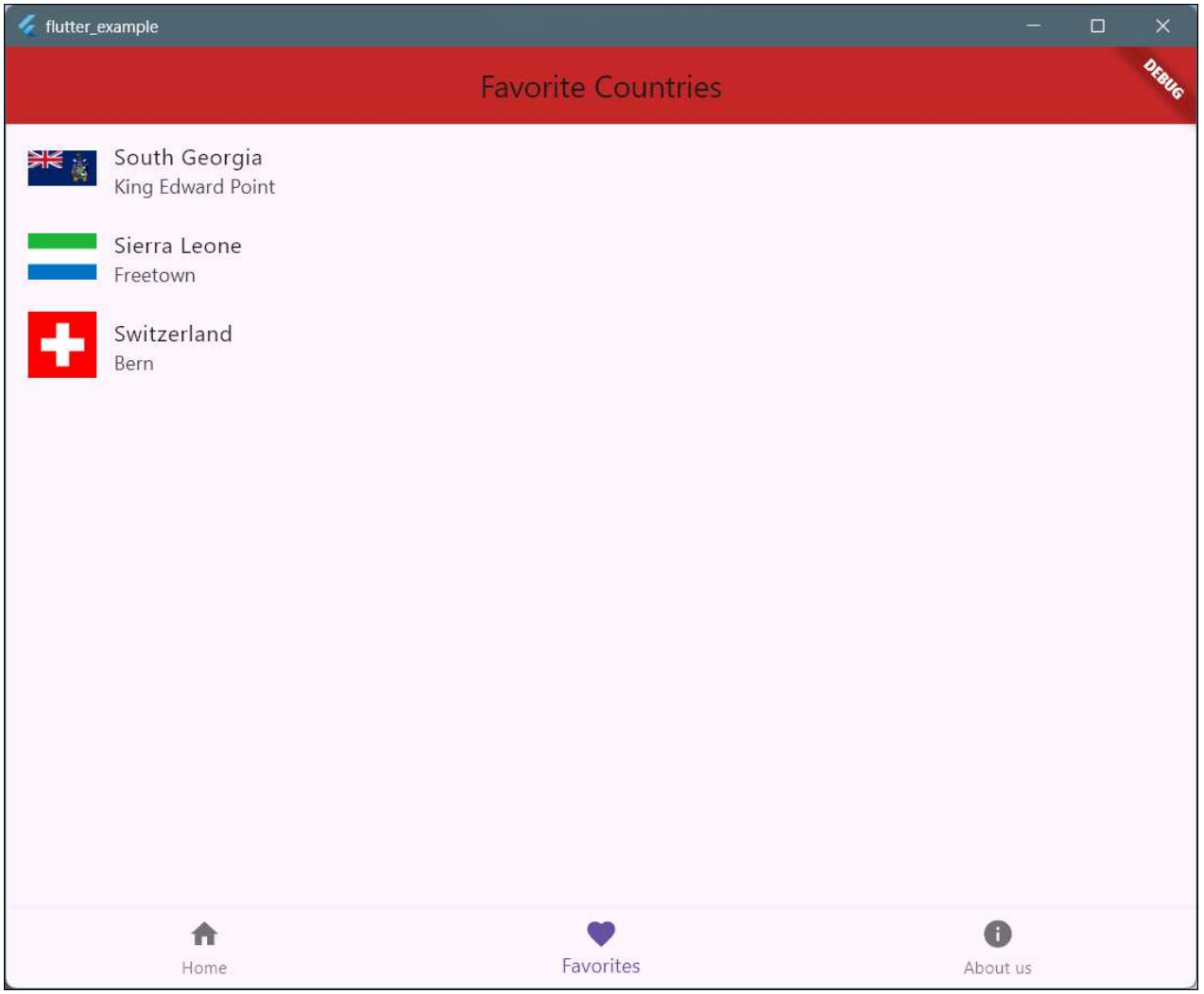
5. Create a ‘Favorites’ screen

- Create `countries_favorites.dart`
- A simple screen that shows all favorite countries from the state
- Also use a `StatelessWidget()` here, because all state comes from the store/bloc!

Code for `countries_favorites.dart`

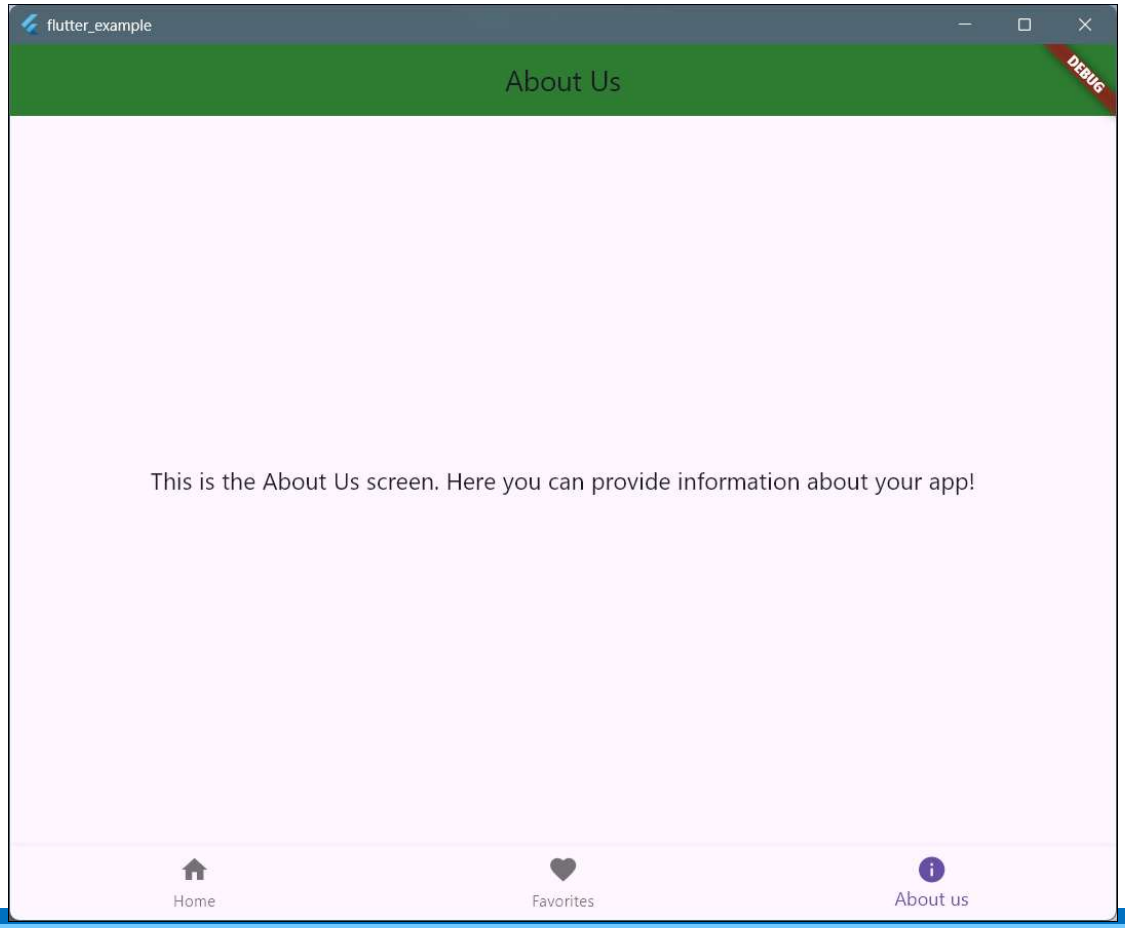
```
…
class CountriesFavorites extends StatelessWidget {
  Widget build(BuildContext context) {
   …
      body: BlocBuilder<CountriesBloc, CountriesState>(
        builder: (context, state) {
          if (state is CountriesLoaded) {
            if (state.favorites.isEmpty) {
              return const Center(child: Text('No favorite countries yet.'));
            }
            // because this is the same ListView.builder() as in countries_home.dart, we
            // could also move this to its own widget/file.
            return ListView.builder(
              itemCount: state.favorites.length,
              itemBuilder: (context, index) {
  …             );
          } else {
            return const Center(child: CircularProgressIndicator());
          }
        },
 …
```

Visual for `countries_favorites.dart`



6. Create the ‘About us’ screen

- Create `about.dart` and fill with relevant data



7. Update Main application

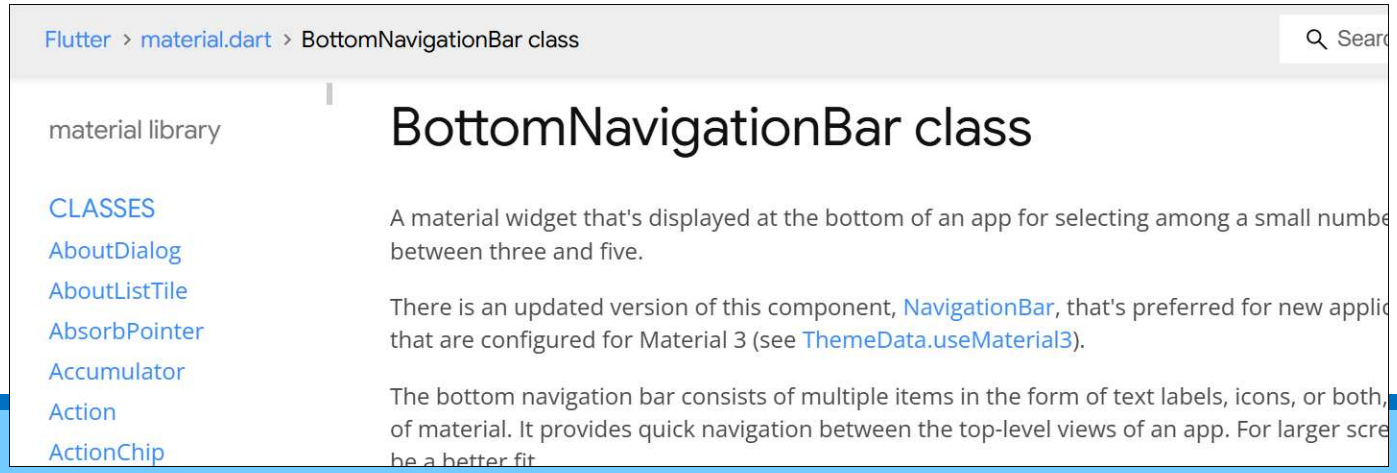
- Update `main.dart` to integrate the `BottomNavigationBar` with the three screens
- Also provide the `BlocProvider()`, since state is used in multiple screens
  - Otherwise we would have to create separate `BlocProvider()`'s on each page.

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

  // This widget is the root of your application.
  @override
  Widget build(BuildContext context) {
    return BlocProvider(
      create: (context) => CountriesBloc()..add(FetchCountries()),
      child: MaterialApp(
        // The Bottom navigation bar now holds the
        // Scaffold() that wraps all pages/screens
        home: const BottomNavBar(),
      ),
    );
  }
}
```

8. Create Bottom Navigation Bar

- Bottom Navigation Bar has a list of `_pages`
- Pages are bound to `BottomNavigationBarItems()`
- There is a generic function that sets the `index`
- The page belonging to the `index` is assigned as the `body:` of the `Scaffold()`
- api.flutter.dev/flutter/material/BottomNavigationBar-class.html



Main.dart logic

```dart
// start with the first icon selected.
int _selectedIndex = 0;

// A list with all possible pages from the app
final List<Widget> _pages = [
  const CountriesHome(),
  const CountriesFavorites(),
  const AboutScreen(),
];

// The user tapped a specific item in the bottom navigation bar.
// Set its index in the state
void _onNavigationItemTapped(int index) {
  setState(() {
    _selectedIndex = index;
  });
}
```

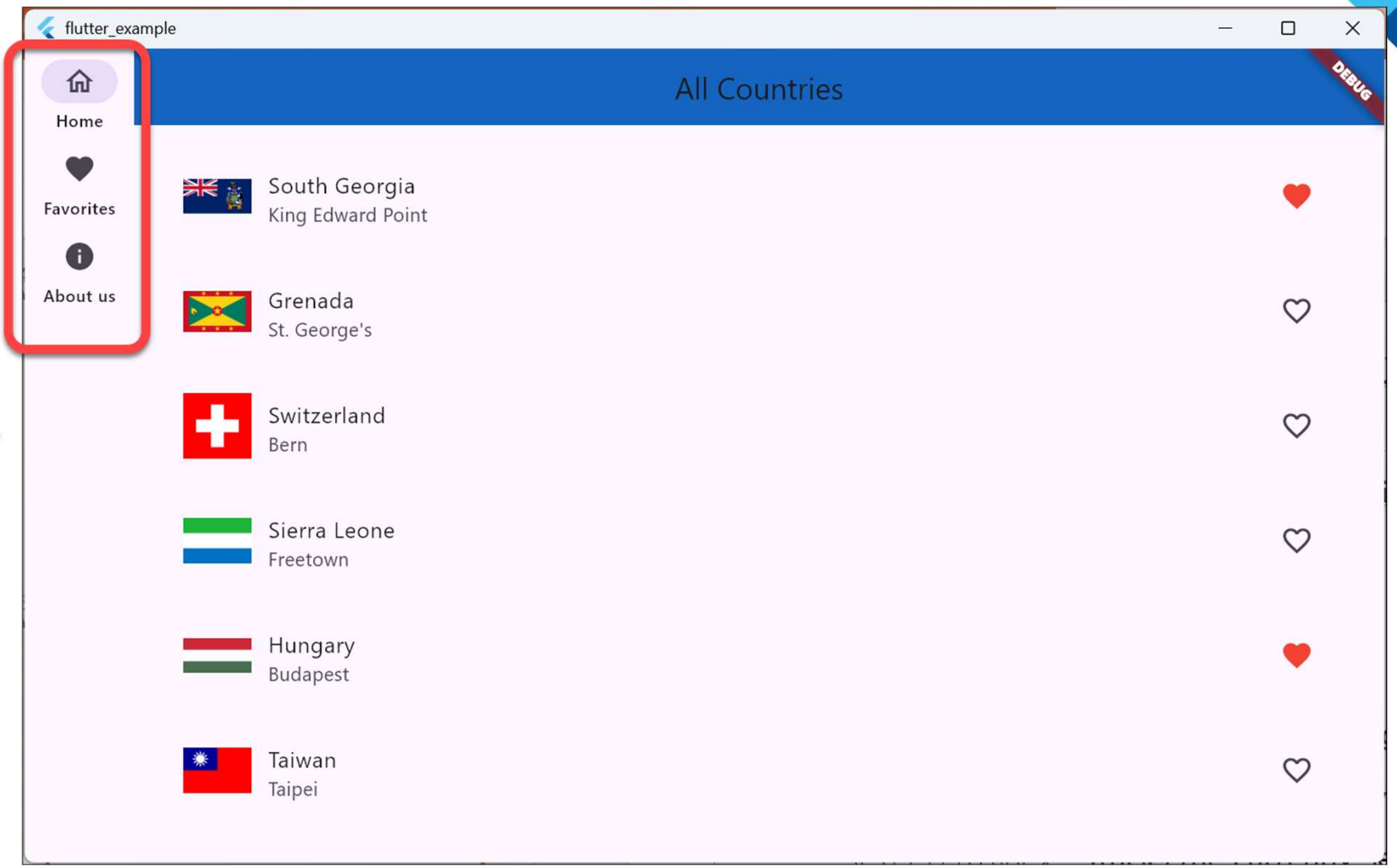
Main.dart UI

```
Widget build(BuildContext context) {
  return Scaffold(
    body: _pages[_selectedIndex],
    bottomNavigationBar: BottomNavigationBar(
      currentIndex: _selectedIndex,
        onTap: _onNavigationItemTapped,
        items: const [
          BottomNavigationBarItem(
              icon: Icon(Icons.home),
              label: 'Home'),
          BottomNavigationBarItem(
              icon: Icon(Icons.favorite),
              label: 'Favorites'),
          BottomNavigationBarItem(
              icon: Icon(Icons.info),
              label: 'About us'),
        ]),
  );
}
```

On Desktop: `NavigationRail()` widget

- On Desktop applications, a `NavigationRail()` might be more suitable
- Same principle, some changes:
  - Now use a `Row()` for the main layout
  - Wrap the content in an `Expanded()` widget
- Lots of properties for customizing available:
  - `selectedIndex` - Tracks the currently selected index.
  - `onDestinationSelected` –Handles user interactions and updates the `_selectedIndex`
  - `Destinations` – Lists the items shown in the navigation rail with icons and text labels.

App with `NavigationRail()`



More info

Flutter › material.dart › NavigationRail class

Search API Docs

material library

CLASSES

AboutDialog
AboutListTile
AbsorbPointer
Accumulator
Action
ActionChip
ActionDispatcher
ActionIconTheme
ActionIconThemeData
ActionListener
Actions
ActivateAction
ActivateIntent
Adaptation
AdaptiveTextSelectionT...
AlertDialog
Align
Alignment
AlignmentDirectional
AlignmentGeometry

NavigationRail class

A Material Design widget that is meant to be displayed at the left or right of an app to navigate between a small number of views, typically between three and five.

The navigation rail is meant for layouts with wide viewports, such as a desktop web or tablet landscape layout. For smaller layouts, like mobile portrait, a BottomNavigationBar should be used instead.

A navigation rail is usually used as the first or last element of a Row which defines the app's Scaffold body.

The appearance of all of the NavigationRails within an app can be specified with NavigationRailTheme. The default values for null theme properties are based on the Theme's ThemeData.textTheme, ThemeData.iconTheme, and ThemeData.colorScheme.

Adaptive layouts can build different instances of the Scaffold in order to have a navigation rail for more horizontal layouts and a bottom navigation bar for more vertical layouts. See the adaptive_scaffold.dart sample for an example.

https://api.flutter.dev/flutter/material/NavigationRail-class.html

Workshop

- Use `../examples/_440-complete-application` as inspiration
- Create your own application using the `JSONPlaceholder API` with users
- Fetch users, add the option to toggle users as favorite/unfavorite
- Optional: implement *swipe-to-delete* from Favorites