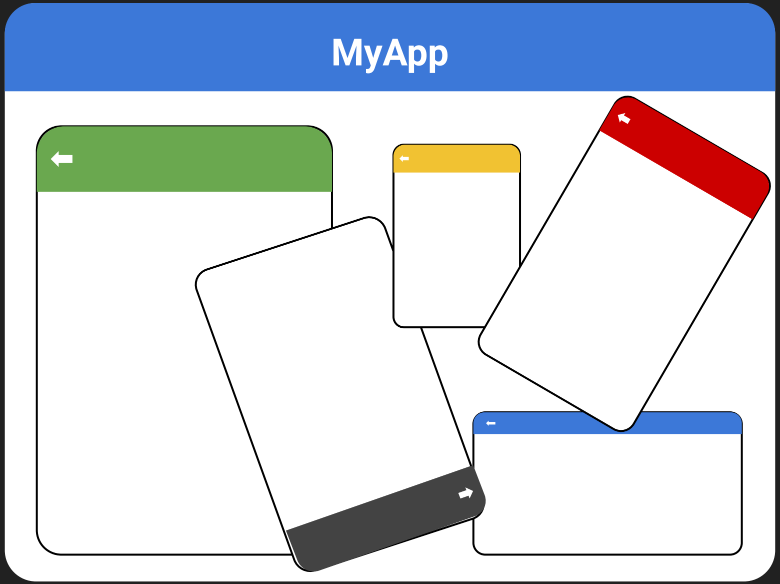
Multiple Navigators with Beamer



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About me

- Sandro Lovnički, @slovnicki
- Flutterer at Friendly Fire
- Organizer at GDG Zagreb and Flutter Croatia
- Creator of Beamer
- Co-host of Flutter dArtist

- GitHub: https://github.com/slovnicki
- Twitter: https://twitter.com/slovnicki
- LinkedIn: https://www.linkedin.com/in/slovnicki
- Medium: https://medium.com/@slovnicki

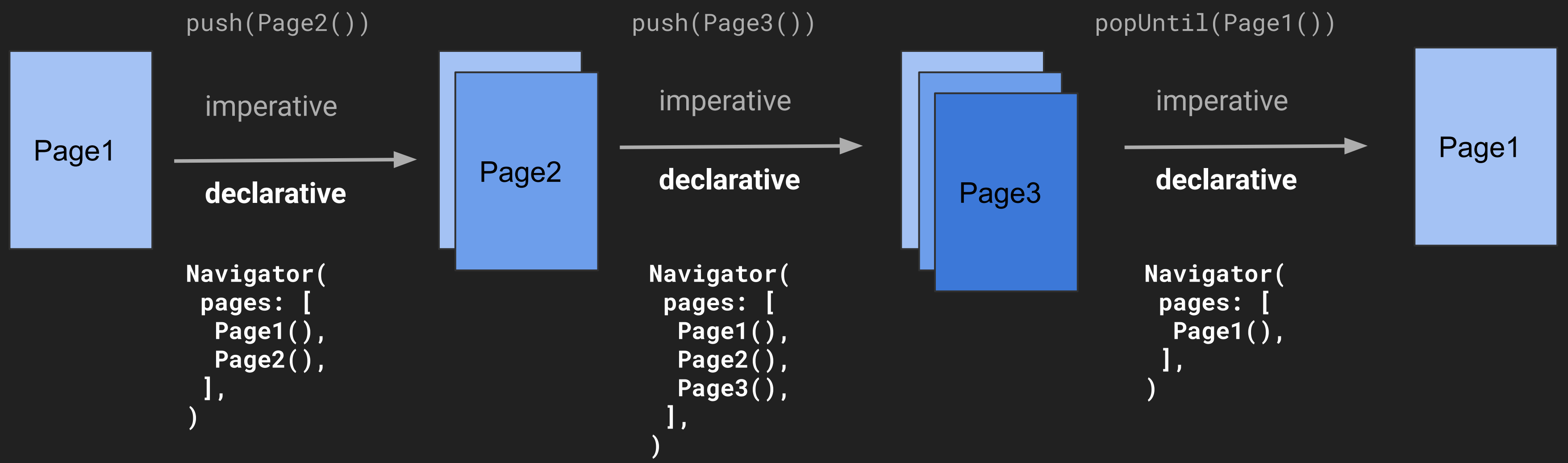
Table of Contents

Navigator

- A **Widget** that holds and manages a list of pages currently displayed (**stacked**) on the screen; https://api.flutter.dev/flutter/widgets/Navigator-class.html

- Supports 2 different APIs; imperative and declarative
    - **Imperative**: Navigator.push, Navigator.pop, etc.
    - **Declarative**: rebuilding Navigator with a new List of pages

Navigator



```
Navigator(
 pages: [
  Page1(),
  Page2(),
 ],
)
```

```
Navigator(
 pages: [
  Page1(),
  Page2(),
  Page3(),
 ],
)
```

```
Navigator(
 pages: [
  Page1(),
 ],
)
```

“Every navigation event is deep-linking”

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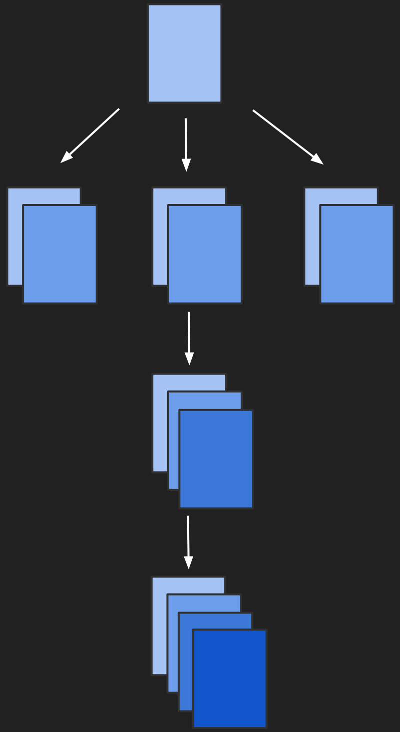
Navigator

Navigator controls **1 stack** of pages.

Is this enough for **all** application?



Navigator

WHAT IF I TOLD YOU
THERE CAN BE MORE THAN 1 NAVIGATOR
imgflip.com

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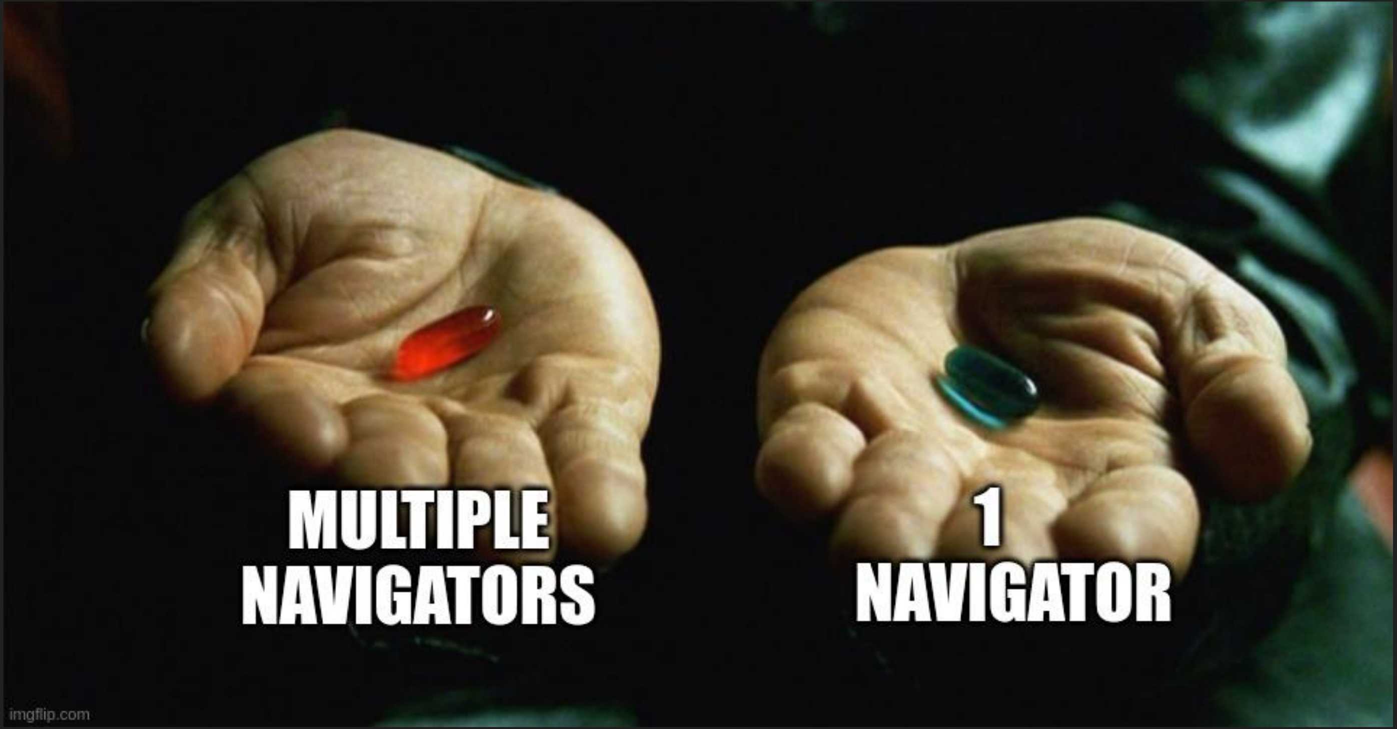
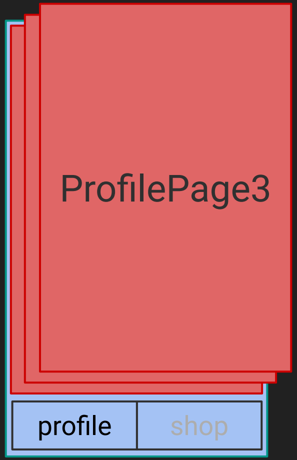
Navigator



Multiple Navigators

- Application with BottomNavigationBar where each tab has an independent stack of pages, e.g. Twitter.



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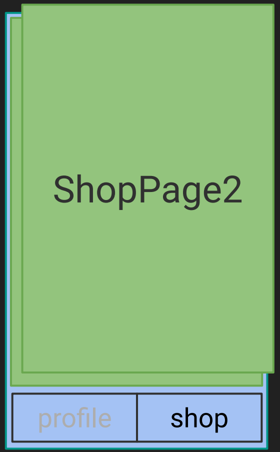

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Multiple Navigators

How?

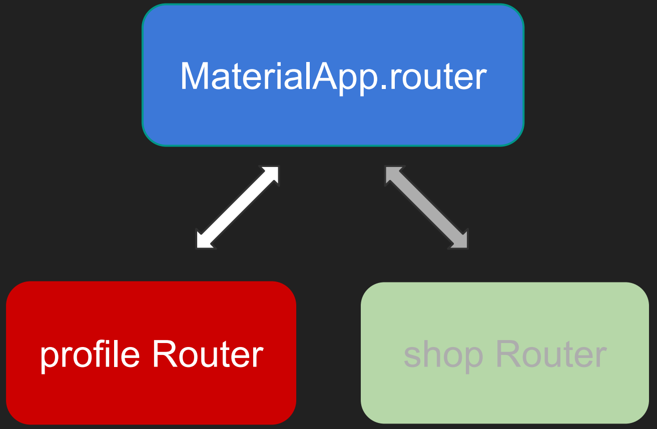
Let’s first see how can we build a Navigator…

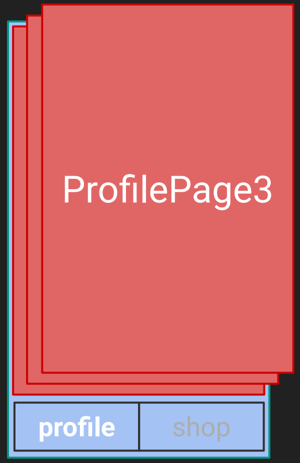
One way is to (re)build a Navigator widget directly, with setState in a custom StatefulWidget, but this will lack web functionalities. If we want to have

- Uniform representation on all platforms
- Support for web URLs

We need to manage the **Navigator** through **Router**.

Multiple Navigators





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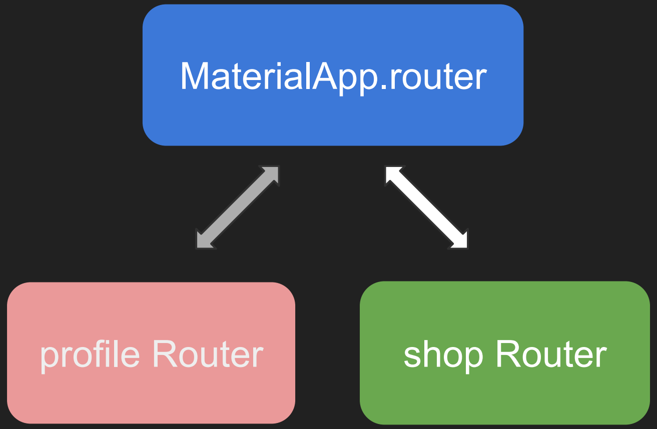
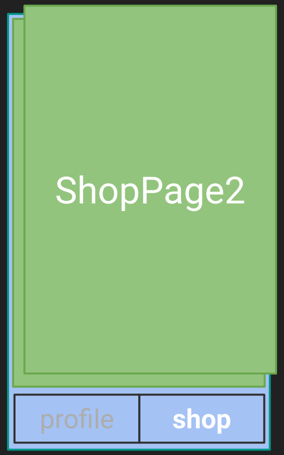
Multiple Navigators





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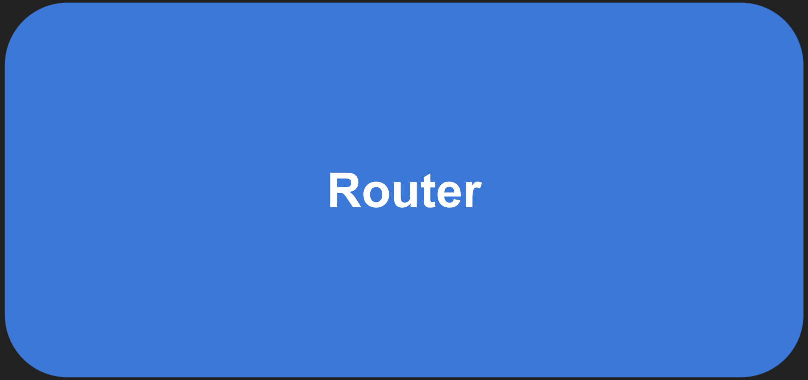
Router

- https://api.flutter.dev/flutter/widgets/Router-class.html
- A **Widget** that uses its components to
    - Get a piece of routing information from and to platform (**RouteInformationProvider**, usually *PlatformRouteInformationProvider*)
    - Parse the routing information into an object that it wants to work with internally (**RouteInformationParser**)
    - Build a Navigator widget and notifies of any changes in routing (**RouterDelegate**)
    - Handle the (Android) back button (**BackButtonDispatcher**)



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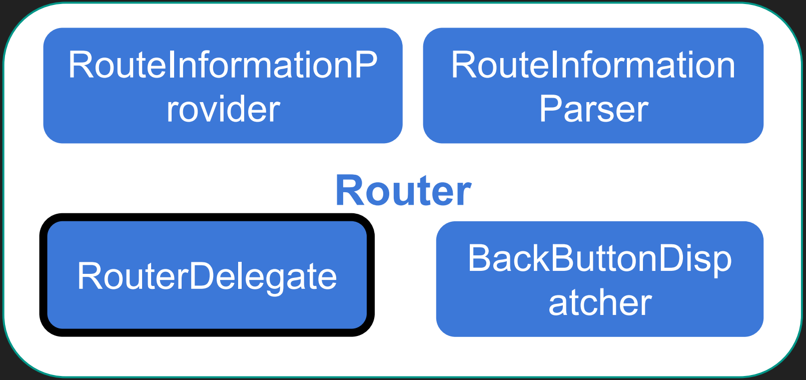

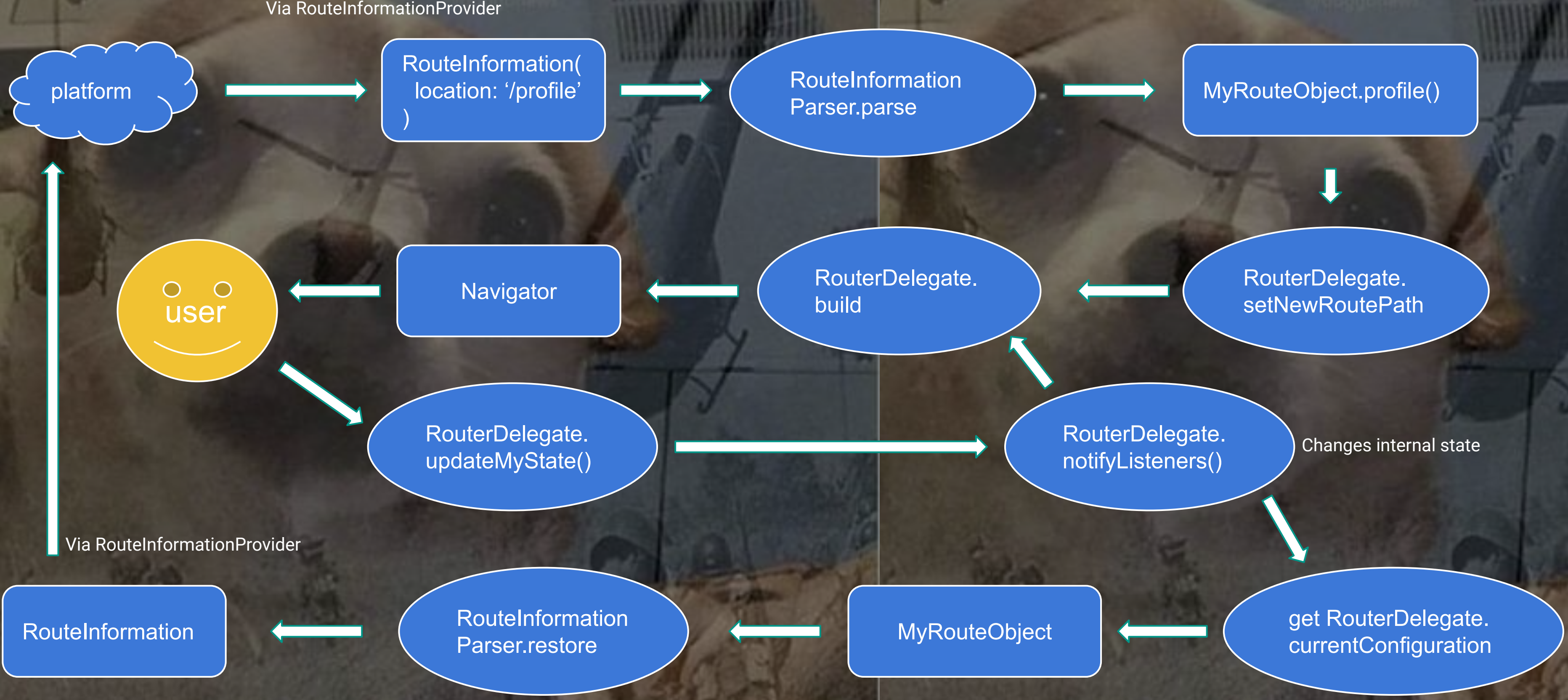
Via RouteInformationProvider
platform
RouteInformation(location: '/profile')
RouteInformation Parser.parse
MyRouteObject.profile()
RouterDelegate. setNewRoutePath
RouterDelegate. build
Navigator
user
RouterDelegate. updateMyState()
RouterDelegate. notifyListeners()
Changes internal state
get RouterDelegate. currentConfiguration
MyRouteObject
RouteInformation Parser.restore
RouteInformation
Via RouteInformationProvider

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Router

How to use it? (**in short**)

- MaterialApp.router
- Decide how to represent the routing state
- Implement RouteInformationParser
  - Override parseRouteInformation
  - Override restoreRouteInformation
- Implement RouterDelegate
  - Override setNewRoutePath
  - Override build
    - return a Navigator populated with a list of pages reflecting the routing state
    - Make sure to update routing state in Navigator.onPopPage
  - Override currentConfiguration
- Optionally override BackButtonDispatcher

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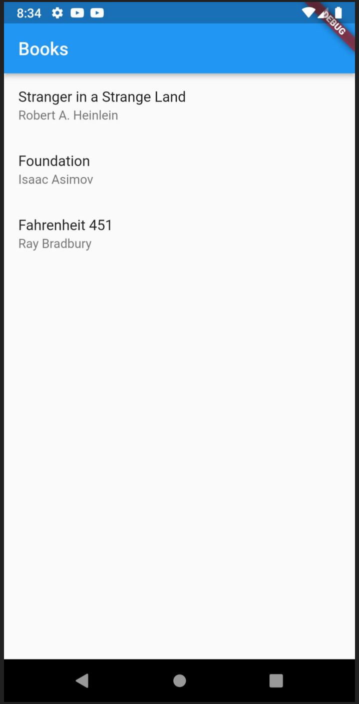
Router

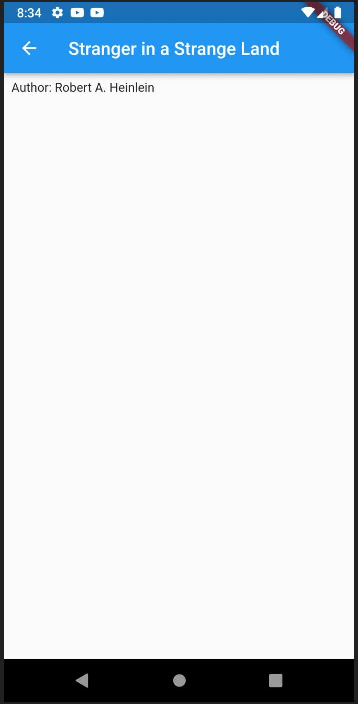

8:34

Books

Stranger in a Strange Land
Robert A. Heinlein

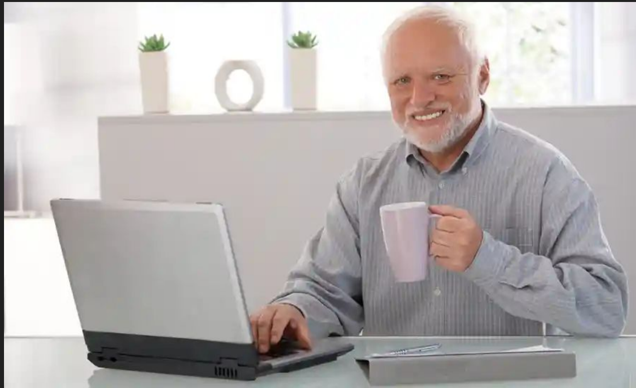
Foundation
Isaac Asimov

Fahrenheit 451
Ray Bradbury


8:34

Stranger in a Strange Land

Author: Robert A. Heinlein



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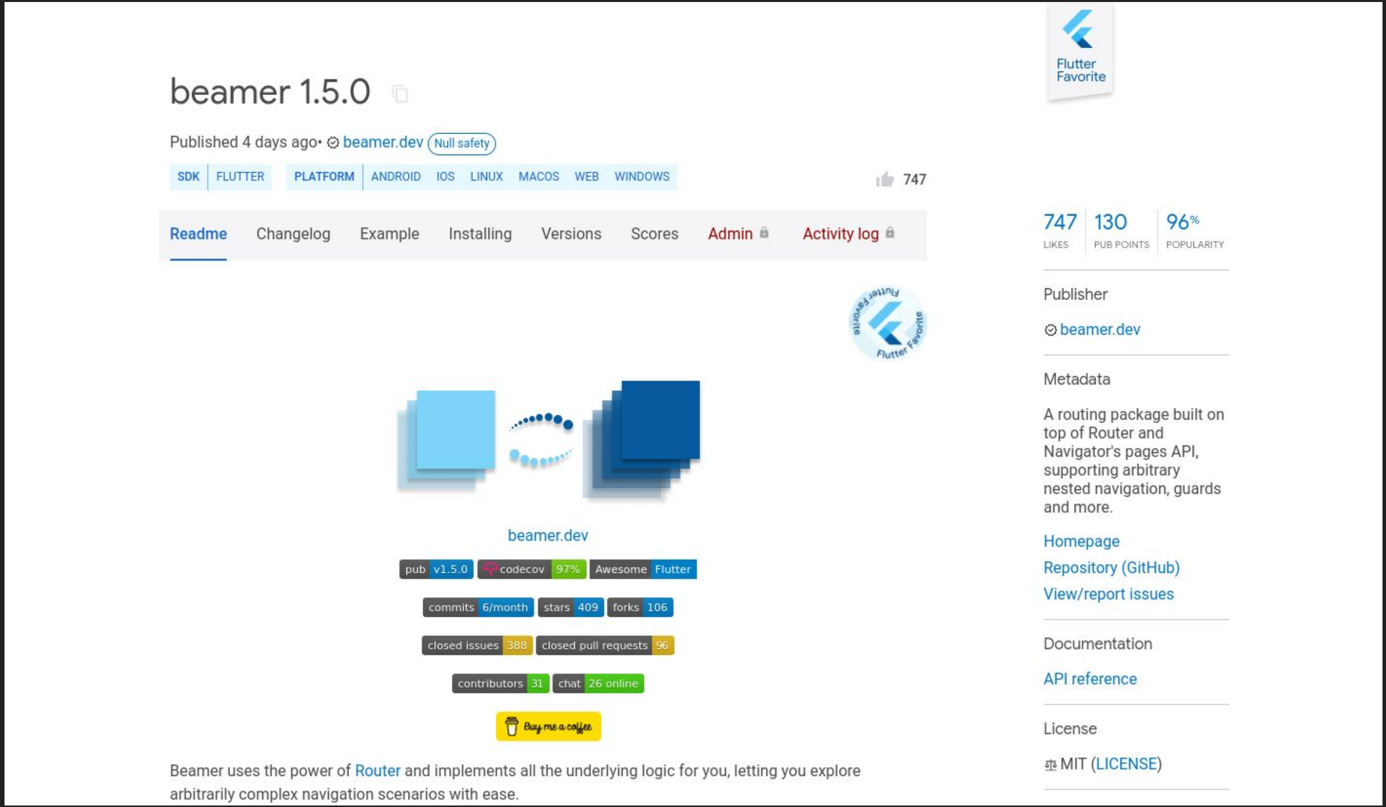
Beamer



beamer 1.5.0

Published 4 days ago• beamer.dev Null safety

SDK | FLUTTER   PLATFORM | ANDROID IOS LINUX MACOS WEB WINDOWS   747

Readme Changelog Example Installing Versions Scores Admin Activity log

beamer.dev

pub v1.5.0 | codecov 97% | Awesome Flutter

commits 6/month | stars 409 | forks 106

closed issues 388 | closed pull requests 96

contributors 31 | chat 26 online

Buy me a coffee

Beamer uses the power of Router and implements all the underlying logic for you, letting you explore arbitrarily complex navigation scenarios with ease.

Flutter Favorite

747 LIKES | 130 PUB POINTS | 96% POPULARITY

Publisher

beamer.dev

Metadata

A routing package built on top of Router and Navigator's pages API, supporting arbitrary nested navigation, guards and more.

Homepage
Repository (GitHub)
View/report issues

Documentation

API reference

License

MIT (LICENSE)

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Beamer

- A routing package built on top of **Router** and **Navigator's pages API**, supporting arbitrary nested navigation, guards and more.

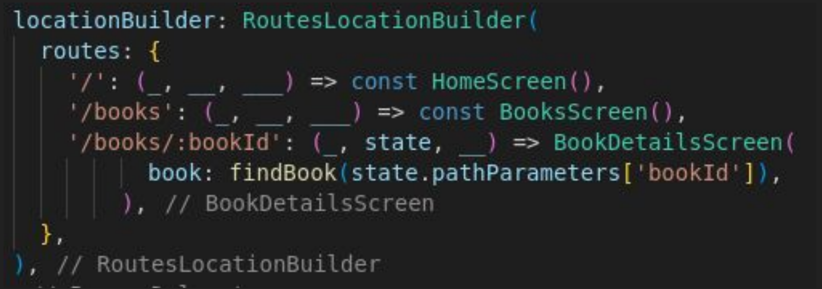
- Beamer uses the power of Router and implements all the underlying logic for you, letting you explore **arbitrarily complex navigation scenarios** with ease.

- **Beamer** Widget builds a **Router** Widget, which in turn is responsible for building a **Navigator** via its RouterDelegate

- **1 Beamer = 1 Router = 1 Navigator**

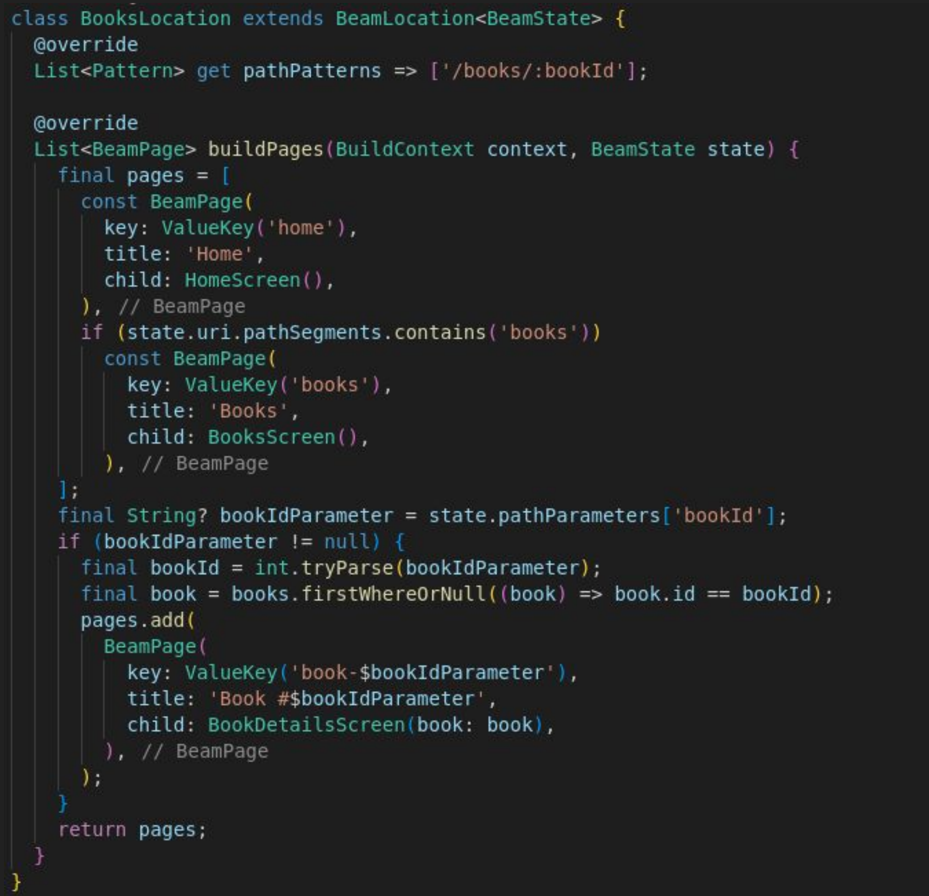
Beamer

RoutesLocationBuilder



```dart
locationBuilder: RoutesLocationBuilder(
  routes: {
    '/': (_, __, ___) => const HomeScreen(),
    '/books': (_, __, ___) => const BooksScreen(),
    '/books/:bookId': (_, state, __) => BookDetailsScreen(
          book: findBook(state.pathParameters['bookId']),
        ), // BookDetailsScreen
  },
), // RoutesLocationBuilder
```

Custom BeamLocations



```dart
class BooksLocation extends BeamLocation<BeamState> {
  @override
  List<Pattern> get pathPatterns => ['/books/:bookId'];

  @override
  List<BeamPage> buildPages(BuildContext context, BeamState state) {
    final pages = [
      const BeamPage(
        key: ValueKey('home'),
        title: 'Home',
        child: HomeScreen(),
      ), // BeamPage
      if (state.uri.pathSegments.contains('books'))
        const BeamPage(
          key: ValueKey('books'),
          title: 'Books',
          child: BooksScreen(),
        ), // BeamPage
    ];
    final String? bookIdParameter = state.pathParameters['bookId'];
    if (bookIdParameter != null) {
      final bookId = int.tryParse(bookIdParameter);
      final book = books.firstWhereOrNull((book) => book.id == bookId);
      pages.add(
        BeamPage(
          key: ValueKey('book-$bookIdParameter'),
          title: 'Book #$bookIdParameter',
          child: BookDetailsScreen(book: book),
        ), // BeamPage
      );
    }
    return pages;
  }
}
```

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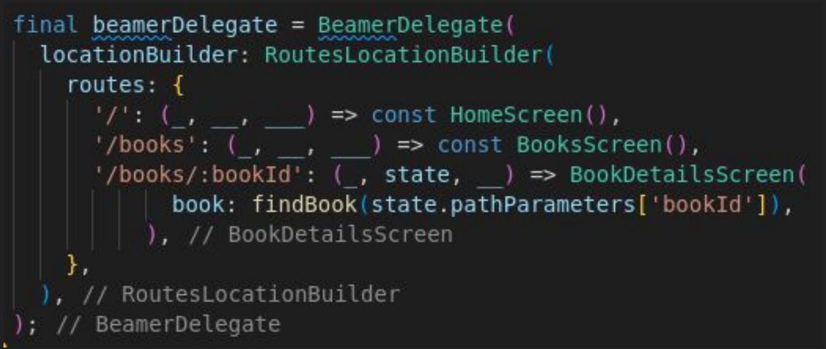
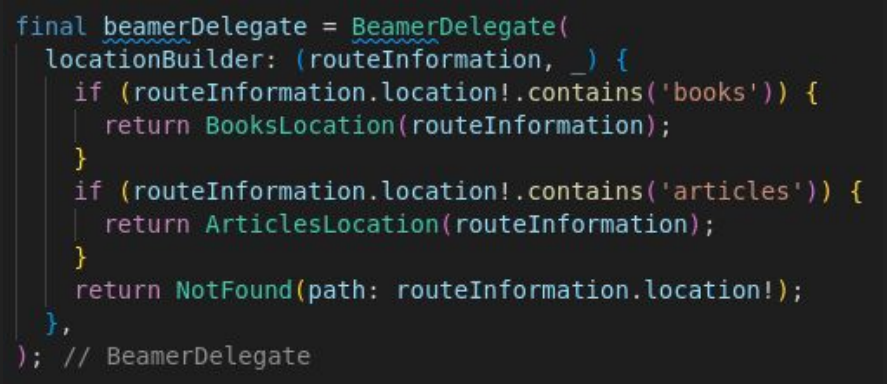
Beamer

RoutesLocationBuilder



```
final beamerDelegate = BeamerDelegate(
  locationBuilder: RoutesLocationBuilder(
    routes: {
      '/': (_, __, ___) => const HomeScreen(),
      '/books': (_, __, ___) => const BooksScreen(),
      '/books/:bookId': (_, state, __) => BookDetailsScreen(
            book: findBook(state.pathParameters['bookId']),
          ), // BookDetailsScreen
    },
  ), // RoutesLocationBuilder
); // BeamerDelegate
```

Custom BeamLocations



```
final beamerDelegate = BeamerDelegate(
  locationBuilder: (routeInformation, _) {
    if (routeInformation.location!.contains('books')) {
      return BooksLocation(routeInformation);
    }
    if (routeInformation.location!.contains('articles')) {
      return ArticlesLocation(routeInformation);
    }
    return NotFound(path: routeInformation.location!);
  },
); // BeamerDelegate
```

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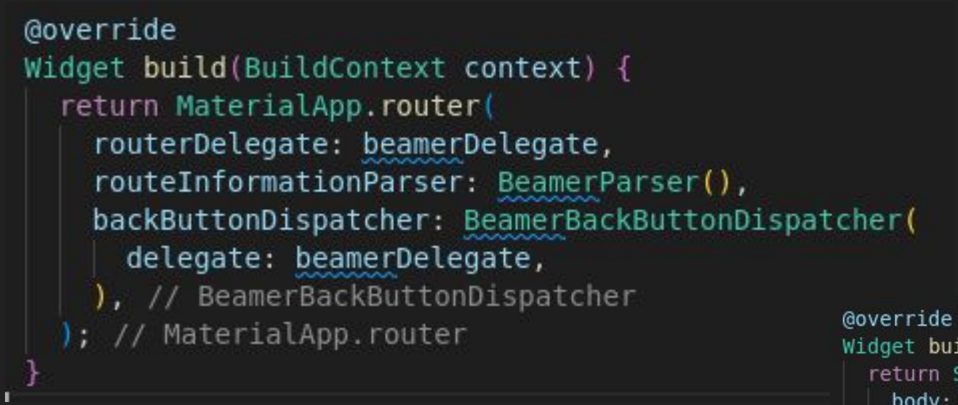
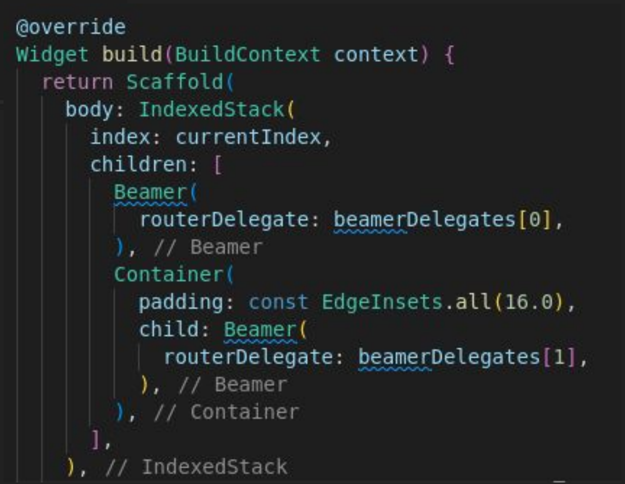
Beamer



```dart
@override
Widget build(BuildContext context) {
  return MaterialApp.router(
    routerDelegate: beamerDelegate,
    routeInformationParser: BeamerParser(),
    backButtonDispatcher: BeamerBackButtonDispatcher(
      delegate: beamerDelegate,
    ), // BeamerBackButtonDispatcher
  ); // MaterialApp.router
}
```



```dart
@override
Widget build(BuildContext context) {
  return Scaffold(
    body: IndexedStack(
      index: currentIndex,
      children: [
        Beamer(
          routerDelegate: beamerDelegates[0],
        ), // Beamer
        Container(
          padding: const EdgeInsets.all(16.0),
          child: Beamer(
            routerDelegate: beamerDelegates[1],
          ), // Beamer
        ), // Container
      ],
    ), // IndexedStack
```

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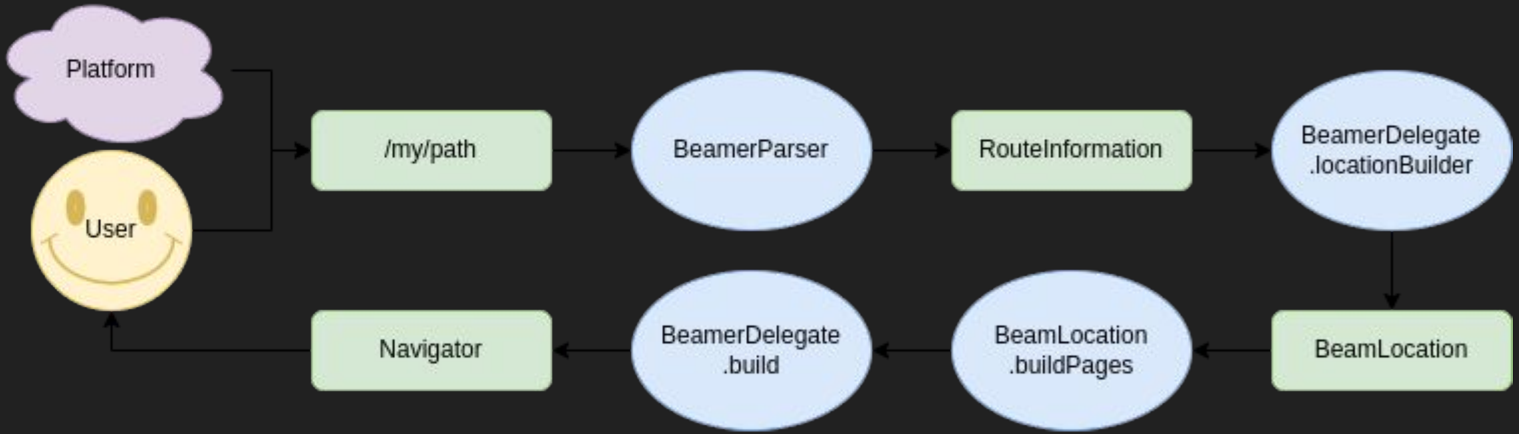
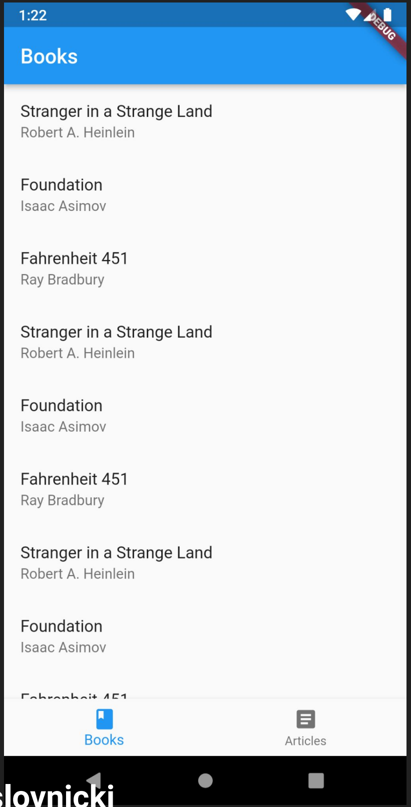
Beamer


Platform
User
/my/path
BeamerParser
RouteInformation
BeamerDelegate .locationBuilder
BeamLocation
BeamLocation .buildPages
BeamerDelegate .build
Navigator

Example


1:22

Books

Stranger in a Strange Land
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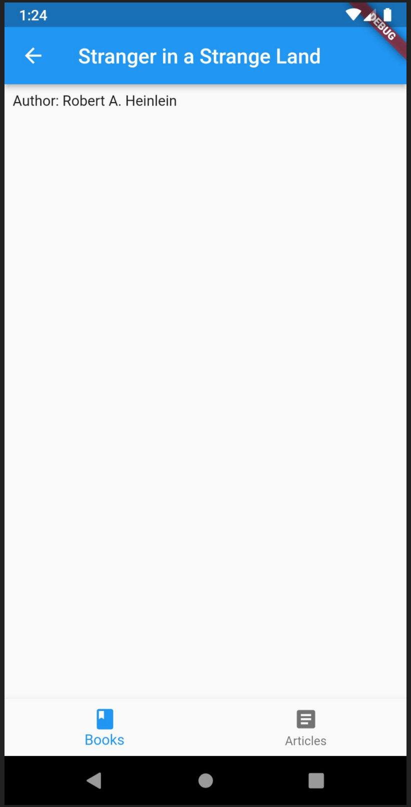
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Stranger in a Strange Land

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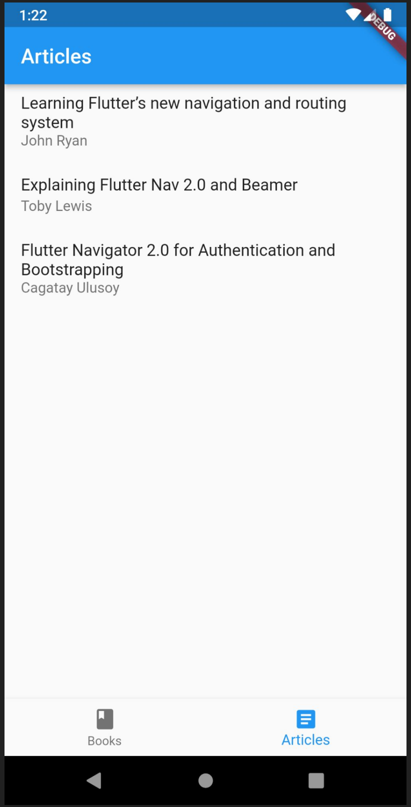
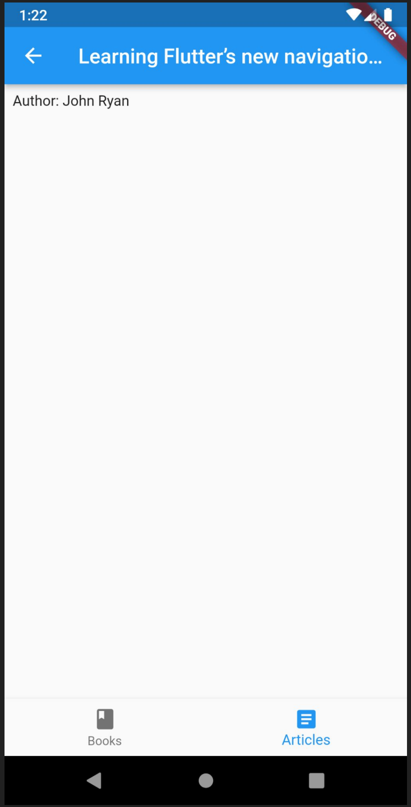

1:22

Articles

Learning Flutter’s new navigation and routing system
John Ryan

Explaining Flutter Nav 2.0 and Beamer
Toby Lewis

Flutter Navigator 2.0 for Authentication and Bootstrapping
Cagatay Ulusoy


1:22

Learning Flutter’s new navigatio...

Author: John Ryan

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Bonus Example

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Sources

- https://api.flutter.dev/flutter/widgets/Navigator-class.html
- https://api.flutter.dev/flutter/widgets/Router-class.html
- https://pub.dev/packages/beamer
- https://github.com/slovnicki/flutter-lithuania-meetup-2

Thanks!