Assignment 2

Mobile Application Development (Theory)

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Section: SE-6B

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DEPARTMENT OF SOFTWARE ENGINEERING
SUPERIOR UNIVERSITY, LAHORE

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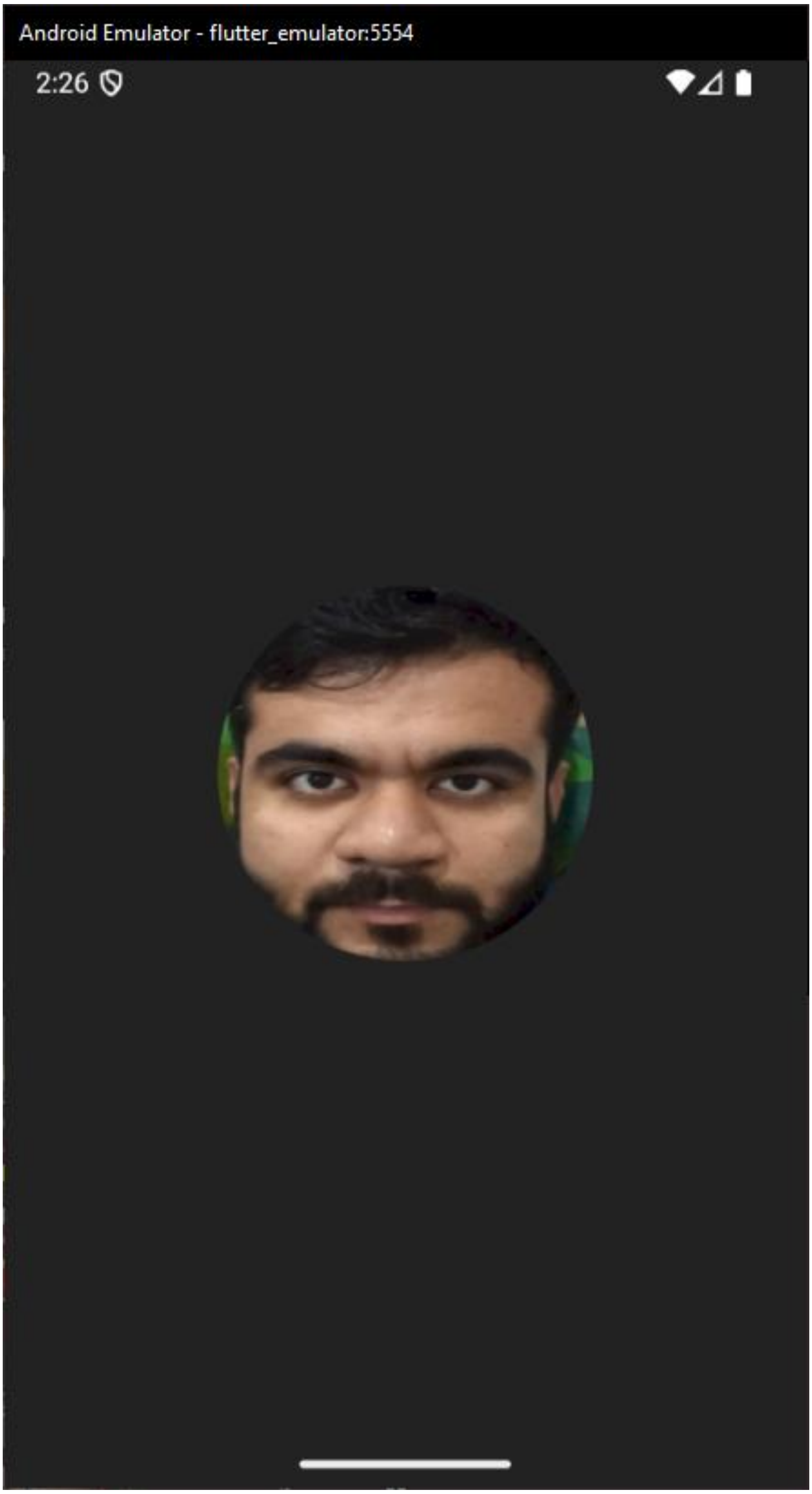
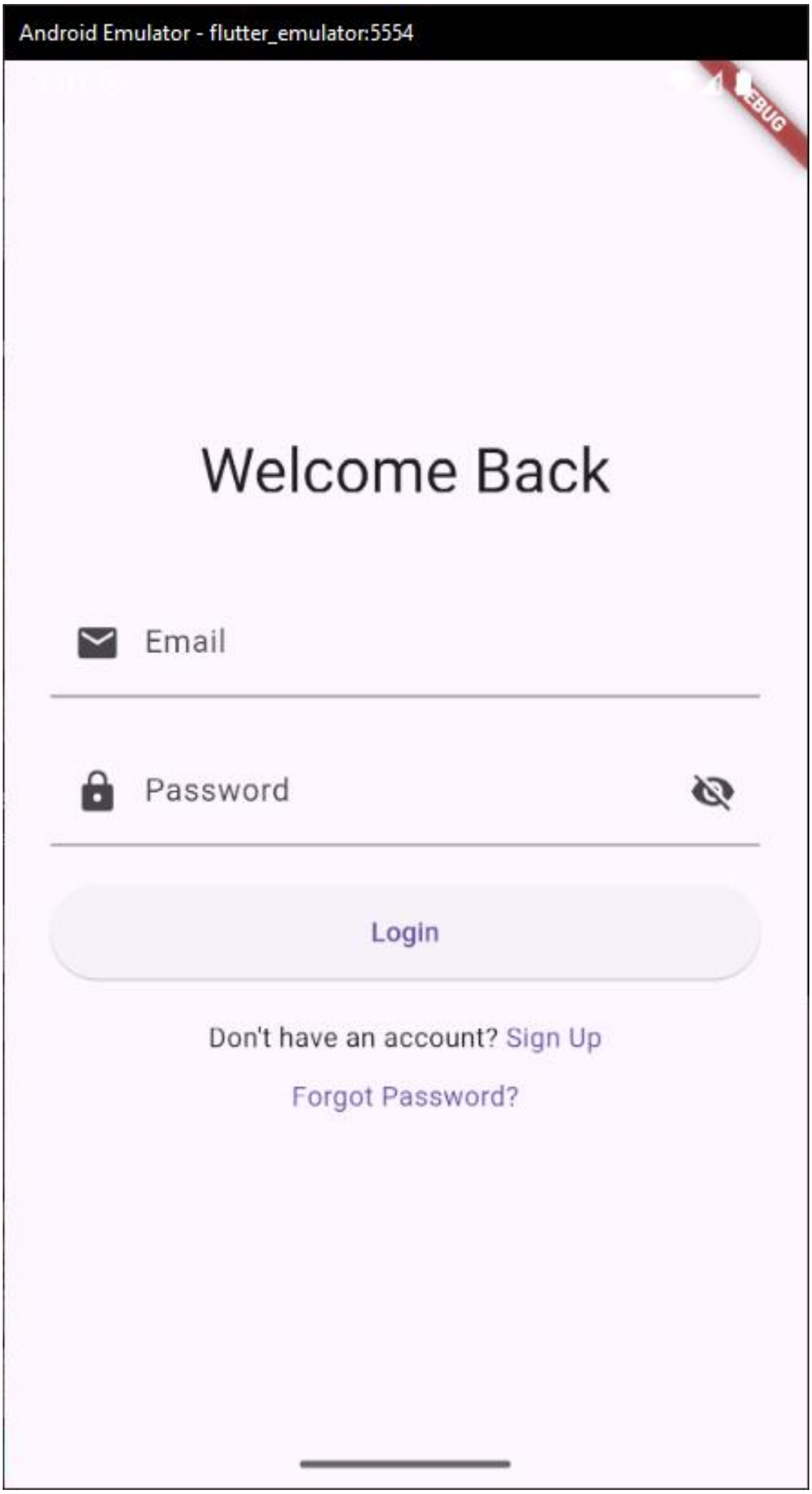
GitHub Repository

GitHub Repository Link

Question 1

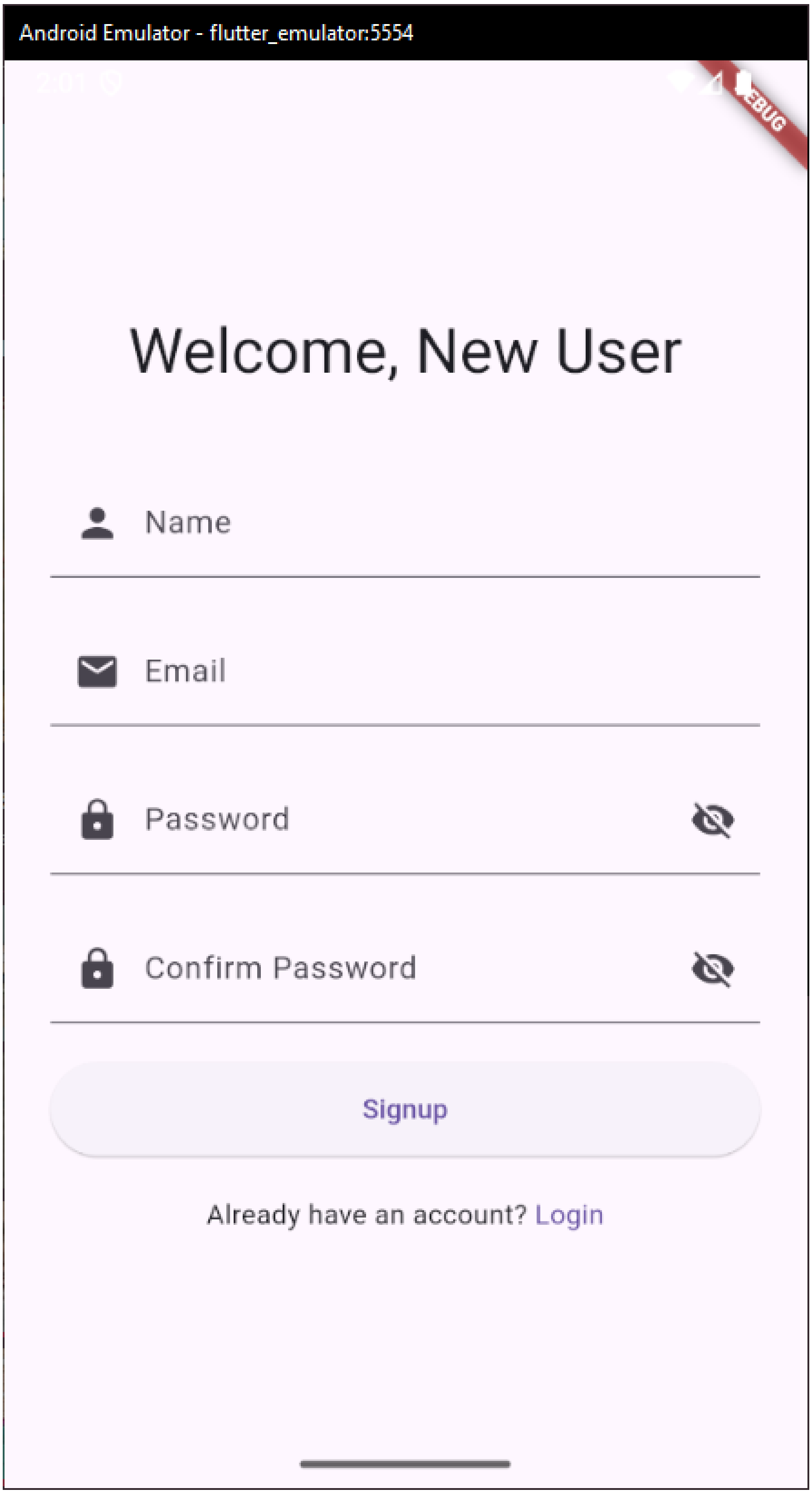
Screenshots


Android Emulator - flutter_emulator:5554
2:26



Android Emulator - flutter_emulator:5554

Welcome Back



Welcome, New User

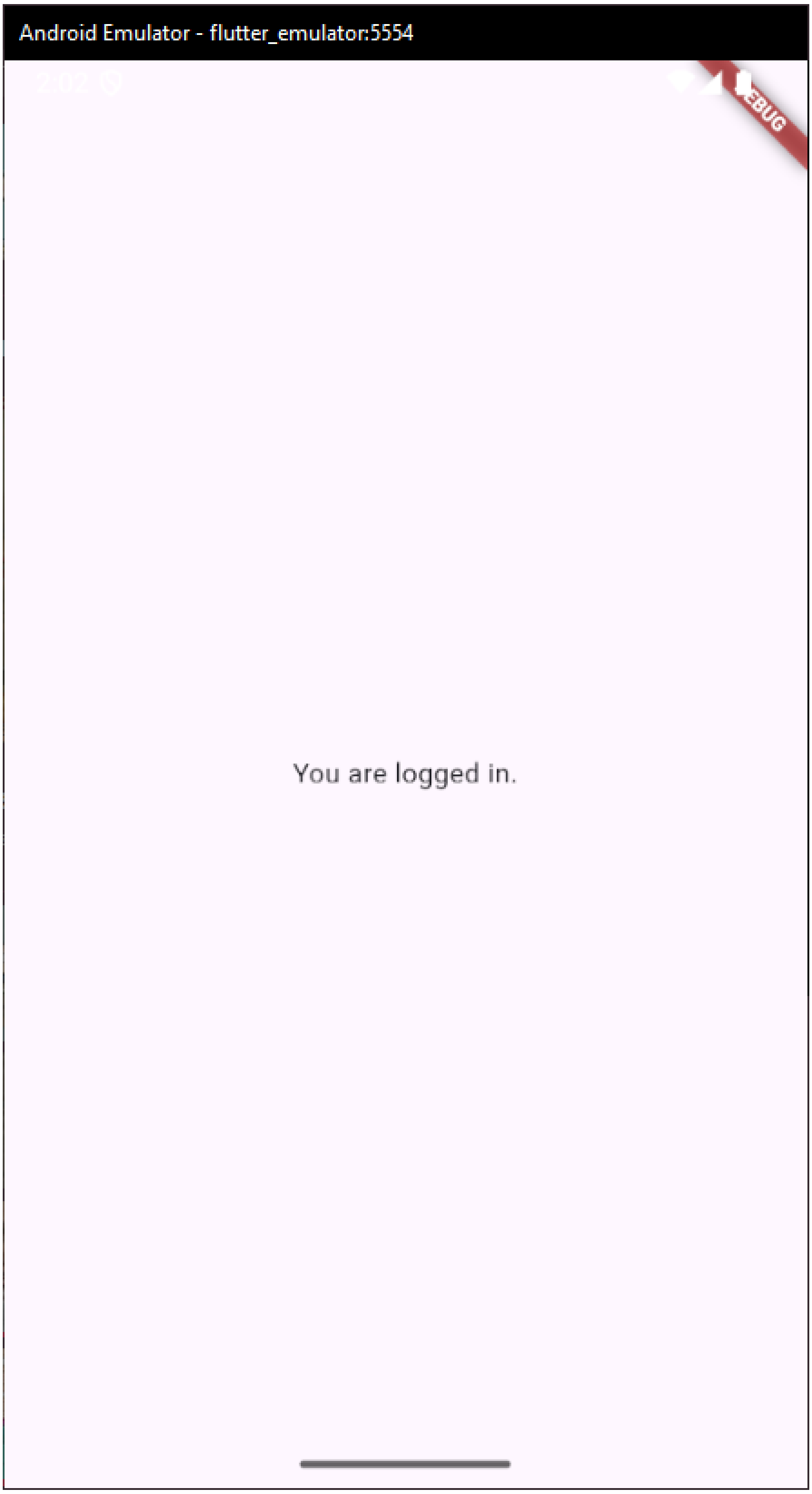
Name

Email

Password

Confirm Password

Already have an account? Login



Android Emulator - flutter_emulator:5554

You are logged in.

Code

To make a splash screen, install flutter_native_splash package. Configure a YAML file with your splash screen attributes like color, logo, background image, branding, etc. and run “dart run flutter_native_splash:create –path=flutter_native_splash.yaml”.

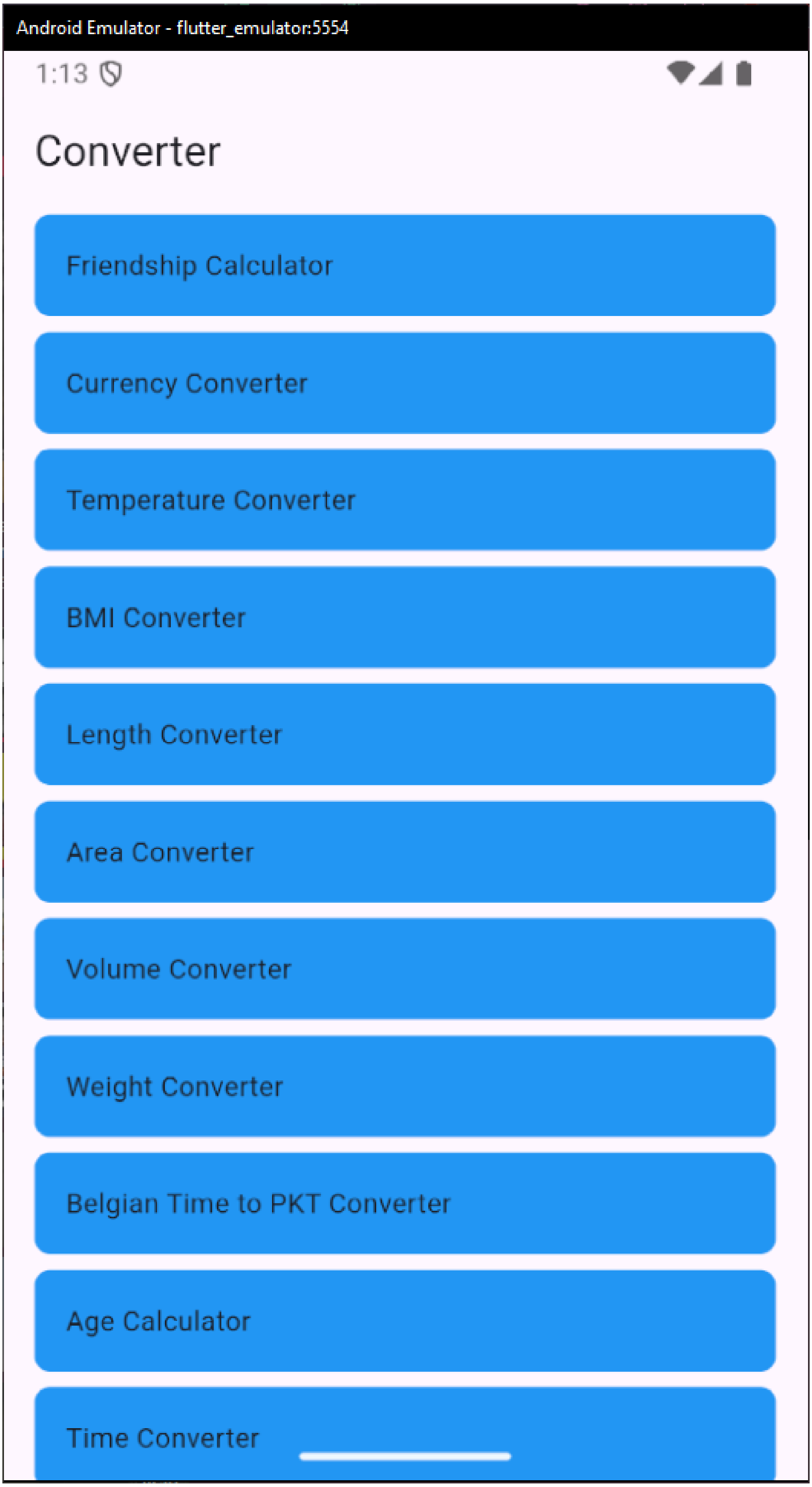
```
import 'package:assignment_2_q_1/pages/login_page.dart';
import 'package:flutter/material.dart';
import 'package:flutter_native_splash/flutter_native_splash.dart';

void main() {
  WidgetsBinding widgetsBinding = WidgetsFlutterBinding.ensureInitialized();
  FlutterNativeSplash.preserve(widgetsBinding: widgetsBinding);
  runApp(const MainApp());
}

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

  @override
  Widget build(BuildContext context) {
    return const MaterialApp(
      home: LoginScreen(),
    );
  }
}

import 'package:flutter_native_splash/flutter_native_splash.dart';
import 'package:assignment_2_q_1/pages/logged_in_page.dart';
import 'package:assignment_2_q_1/pages/signup_page.dart';
import 'package:flutter/material.dart';

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

  @override
  State<LoginScreen> createState() => _LoginScreenState();
}

class _LoginScreenState extends State<LoginScreen> {
  final _formKey = GlobalKey<FormState>();
  final _emailController = TextEditingController();
  final _passwordController = TextEditingController();
  bool _obscurePassword = true;
  bool _isLoading = false;

  @override
  void initState() {
    super.initState();
    FlutterNativeSplash.remove();
  }

  void _togglePasswordVisibility() {
    setState(() {
```

```
    _obscurePassword = !_obscurePassword;
  });
}

Future<void> _handleLogin() async {
  if (!_formKey.currentState!.validate()) return;

  setState(() {
    _isLoading = true;
  });

  await Future.delayed(Duration(seconds: 1));

  late final String dialogTitle;
  late final String dialogBody;
  if (_emailController.text == "user@example.com" &&
      _passwordController.text == "password") {
    dialogTitle = "Success";
    dialogBody = "Logged in successfully!";
  } else {
    dialogTitle = "Error";
    dialogBody = "Invalid email or password";
  }

  if (mounted) {
    showDialog(
      context: context,
      builder: (dialogContext) {
        return AlertDialog(
          title: Text(dialogTitle),
          content: Text(dialogBody),
          actions: [
            TextButton(
              onPressed: () {
                Navigator.pop(context);
                if (dialogTitle == "Success") {
                  Navigator.push(
                    context,
                    MaterialPageRoute(
                      builder: (context) => LoggedInScreen(),
                    ),
                  );
                }
              },
              child: Text("OK"),
            )
          ],
        );
        },
      );
    }

    setState(() => _isLoading = false);
  }

  @override
  Widget build(BuildContext context) {
    return Scaffold(
      body: Padding(
        padding: const EdgeInsets.all(24.0),
        child: Center(
          child: ConstrainedBox(
            constraints: BoxConstraints(maxWidth: 400),
            child: SingleChildScrollView(
              child: Form(
                key: _formKey,
                child: Column(
                  mainAxisSize: MainAxisSize.min,
                  children: [
                    Text(
                      "Welcome Back",
                      style: Theme.of(context).textTheme.headlineLarge,
                    ),
                    SizedBox(height: 40),
                    TextFormField(
                      controller: _emailController,
                      decoration: InputDecoration(
                        labelText: "Email",
                        prefixIcon: Icon(Icons.email),
                      ),
                      keyboardType: TextInputType.emailAddress,
                      validator: (value) {
                        if (value == null || value.isEmpty) {
                          return "Please enter your email";
                        }
                        if (!RegExp(r'^[\w-\.]+@([\w-]+\.)+[\w-]{2,4}$')
                            .hasMatch(value)) {
                          return "Please enter a valid email";
                        }
                        return null;
                      },
                    ),
                    SizedBox(height: 20),
                    TextFormField(
                      controller: _passwordController,
                      decoration: InputDecoration(
    labelText: "Password",
    prefixIcon: Icon(Icons.lock),
    suffixIcon: IconButton(
      icon: Icon(_obscurePassword
          ? Icons.visibility_off
          : Icons.visibility),
      onPressed: _togglePasswordVisibility,
    ),
  ),
  obscureText: _obscurePassword,
  validator: (value) {
    if (value == null || value.isEmpty) {
      return "Please enter your password";
    }
    if (value.length < 6) {
      return "Password must be at least 6 characters";
    }
    return null;
  },
),
SizedBox(height: 20),
SizedBox(
  width: double.infinity,
  child: _isLoading
      ? Center(child: CircularProgressIndicator())
      : ElevatedButton(
          onPressed: _handleLogin,
          child: Padding(
            padding: const EdgeInsets.all(14.0),
            child: Text("Login"),
          ),
        ),
),
SizedBox(height: 20),
Column(
  mainAxisAlignment: MainAxisAlignment.spaceBetween,
  mainAxisSize: MainAxisSize.max,
  children: [
    Row(
      mainAxisAlignment: MainAxisAlignment.center,
      children: [
        Text("Don't have an account? "),
        MouseRegion(
          cursor: SystemMouseCursors.click,
          child: GestureDetector(
            onTap: () => Navigator.push(
              context,
              MaterialPageRoute(
                                    builder: (context) => SignUpScreen(),
                                  ),
                                ),
                                child: Text(
                                  "Sign Up",
                                  style: TextStyle(
                                    color:
                                        Theme.of(context).colorScheme.primary,
                                  ),
                                ),
                              ),
                            ),
                          ],
                        ),
                        SizedBox(height: 10),
                        MouseRegion(
                          cursor: SystemMouseCursors.click,
                          child: GestureDetector(
                            onTap: () => Placeholder(),
                            child: Text(
                              "Forgot Password?",
                              style: TextStyle(
                                color: Theme.of(context).colorScheme.primary,
                              ),
                            ),
                          ),
                        ),
                      ],
                    ),
                  ],
                ),
              ),
            ),
          ),
        ),
      ),
    );
  }
}

import 'package:flutter/material.dart';

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

  @override
  State<SignUpScreen> createState() => _SignUpScreenState();
}
```

```
class _SignUpScreenState extends State<SignUpScreen> {
  final _formKey = GlobalKey<FormState>();
  final _emailController = TextEditingController();
  final _passwordController = TextEditingController();
  final _confirmPasswordController = TextEditingController();
  bool _obscurePassword = true;
  bool _isLoading = false;

  void _togglePasswordVisibility() {
    setState(() {
      _obscurePassword = !_obscurePassword;
    });
  }

  Future<void> _handleLogin() async {
    if (!_formKey.currentState!.validate()) return;

    setState(() {
      _isLoading = true;
    });

    await Future.delayed(Duration(seconds: 1));

    late final String dialogTitle;
    late final String dialogBody;
    if (_emailController.text == "user@example.com" &&
        _passwordController.text == "password") {
      dialogTitle = "Success";
      dialogBody = "Logged in successfully!";
    } else {
      dialogTitle = "Error";
      dialogBody = "Invalid email or password";
    }

    if (mounted) {
      showDialog(
        context: context,
        builder: (dialogContext) {
          return AlertDialog(
            title: Text(dialogTitle),
            content: Text(dialogBody),
            actions: [
              TextButton(
                onPressed: () => Navigator.pop(context),
                child: Text("OK"),
              )
            ],
          );
        },
      );
    }

    setState(() => _isLoading = false);
  }

  @override
  Widget build(BuildContext context) {
    return Scaffold(
      body: Padding(
        padding: const EdgeInsets.all(24.0),
        child: Center(
          child: ConstrainedBox(
            constraints: BoxConstraints(maxWidth: 400),
            child: SingleChildScrollView(
              child: Form(
                key: _formKey,
                child: Column(
                  mainAxisSize: MainAxisSize.min,
                  children: [
                    Text(
                      "Welcome, New User",
                      style: Theme.of(context).textTheme.headlineLarge,
                    ),
                    SizedBox(height: 40),
                    TextFormField(
                      controller: _emailController,
                      decoration: InputDecoration(
                        labelText: "Name",
                        prefixIcon: Icon(Icons.person),
                      ),
                      validator: (value) {
                        return null;
                      },
                    ),
                    SizedBox(height: 20),
                    TextFormField(
                      controller: _emailController,
                      decoration: InputDecoration(
                        labelText: "Email",
                        prefixIcon: Icon(Icons.email),
                      ),
                      keyboardType: TextInputType.emailAddress,
                      validator: (value) {
                        if (value == null || value.isEmpty) {
                          return "Please enter your email";
    }
    if (!RegExp(r'^[\w-\.]+@([\w-]+\.)+[\w-]{2,4}$')
        .hasMatch(value)) {
      return "Please enter a valid email";
    }
    return null;
  },
),
SizedBox(height: 20),
TextFormField(
  controller: _passwordController,
  decoration: InputDecoration(
    labelText: "Password",
    prefixIcon: Icon(Icons.lock),
    suffixIcon: IconButton(
      icon: Icon(_obscurePassword
          ? Icons.visibility_off
          : Icons.visibility),
      onPressed: _togglePasswordVisibility,
    ),
  ),
  obscureText: _obscurePassword,
  validator: (value) {
    if (value == null || value.isEmpty) {
      return "Please enter your password";
    }
    if (value.length < 6) {
      return "Password must be at least 6 characters";
    }
    return null;
  },
),
SizedBox(height: 20),
TextFormField(
  controller: _confirmPasswordController,
  decoration: InputDecoration(
    labelText: "Confirm Password",
    prefixIcon: Icon(Icons.lock),
    suffixIcon: IconButton(
      icon: Icon(_obscurePassword
          ? Icons.visibility_off
          : Icons.visibility),
      onPressed: _togglePasswordVisibility,
    ),
  ),
  obscureText: _obscurePassword,
  validator: (value) {
    if (value == null || value.isEmpty) {
        return "Please enter your password";
      }
      if (value.length < 6) {
        return "Password must be at least 6 characters";
      }
      return null;
    },
  ),
  SizedBox(height: 20),
  SizedBox(
    width: double.infinity,
    child: _isLoading
        ? Center(child: CircularProgressIndicator())
        : ElevatedButton(
            onPressed: _handleLogin,
            child: Padding(
              padding: const EdgeInsets.all(14.0),
              child: Text("Signup"),
            ),
          ),
  ),
  SizedBox(height: 20),
  Column(
    mainAxisAlignment: MainAxisAlignment.spaceBetween,
    mainAxisSize: MainAxisSize.max,
    children: [
      Row(
        mainAxisAlignment: MainAxisAlignment.center,
        children: [
          Text("Already have an account? "),
          MouseRegion(
            cursor: SystemMouseCursors.click,
            child: GestureDetector(
              onTap: () => Navigator.pop(context),
              child: Text(
                "Login",
                style: TextStyle(
                  color:
                      Theme.of(context).colorScheme.primary,
                ),
              ),
            ),
          ),
        ],
      ),
    ],
  ),
],
                ),
              ),
            ),
          ),
        ),
      ),
    );
  }
}

import 'package:flutter/material.dart';

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

  @override
  Widget build(BuildContext context) {
    return Scaffold(
      body: Center(
        child: Text("You are logged in."),
      ),
    );
  }
}
```

Question 2

Screenshots



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1:13

Converter

Friendship Calculator

Currency Converter

Temperature Converter

BMI Converter

Length Converter

Area Converter

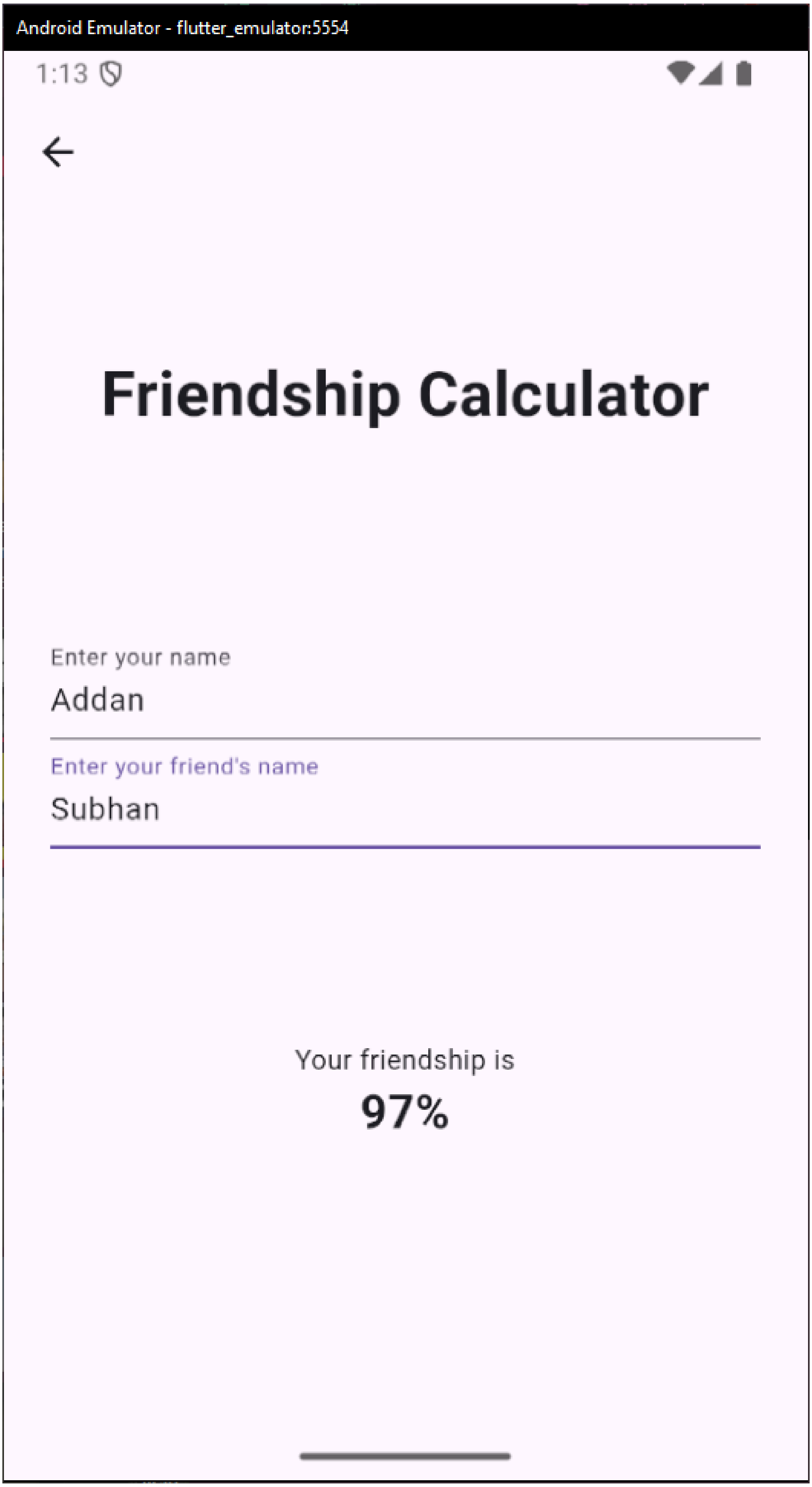
Volume Converter

Weight Converter

Belgian Time to PKT Converter

Age Calculator

Time Converter



Android Emulator - flutter_emulator:5554

1:13

Friendship Calculator

Enter your name

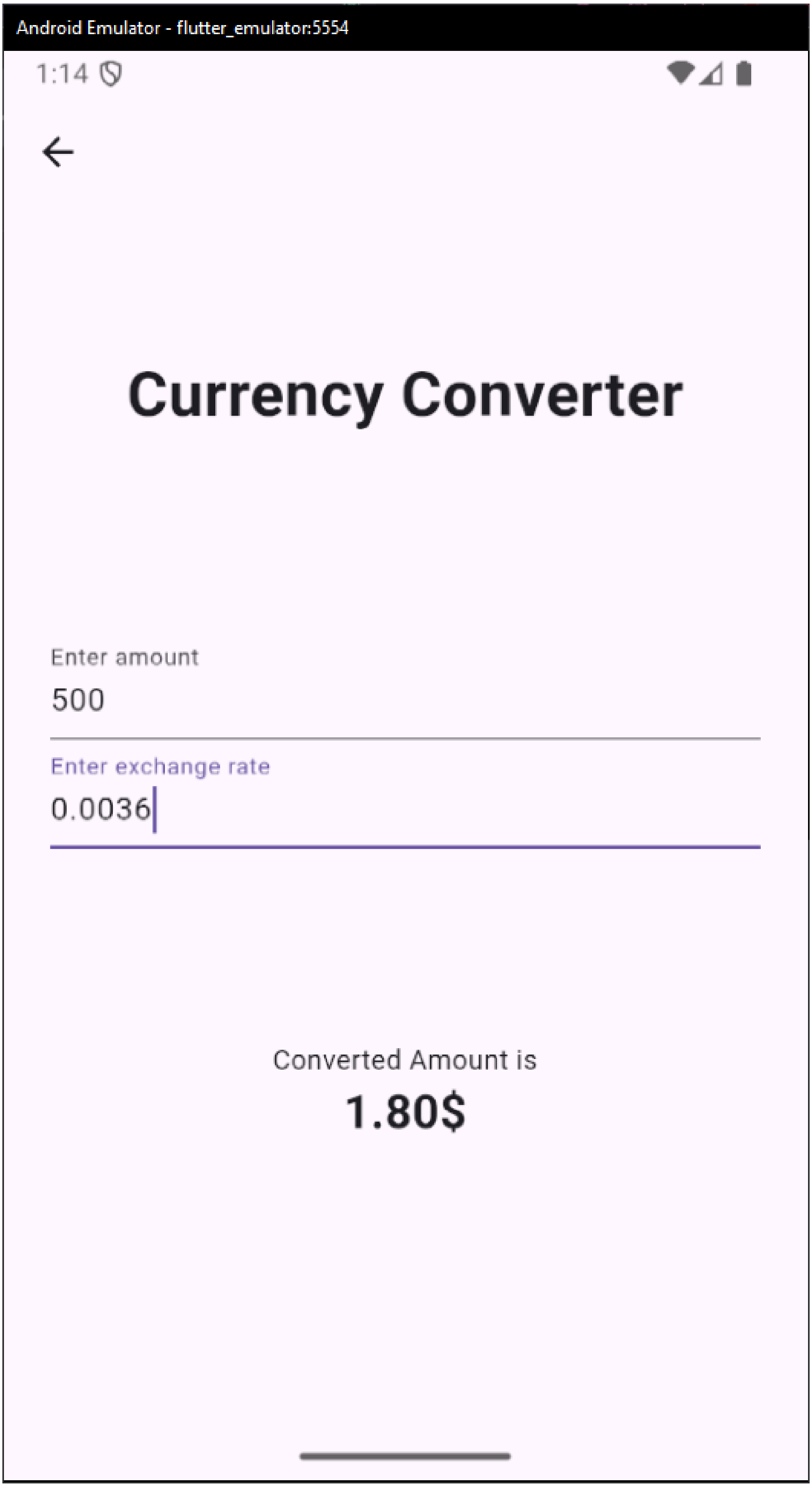
Addan

Enter your friend's name

Subhan

Your friendship is

97%



Android Emulator - flutter_emulator:5554

1:14

Currency Converter

Enter amount

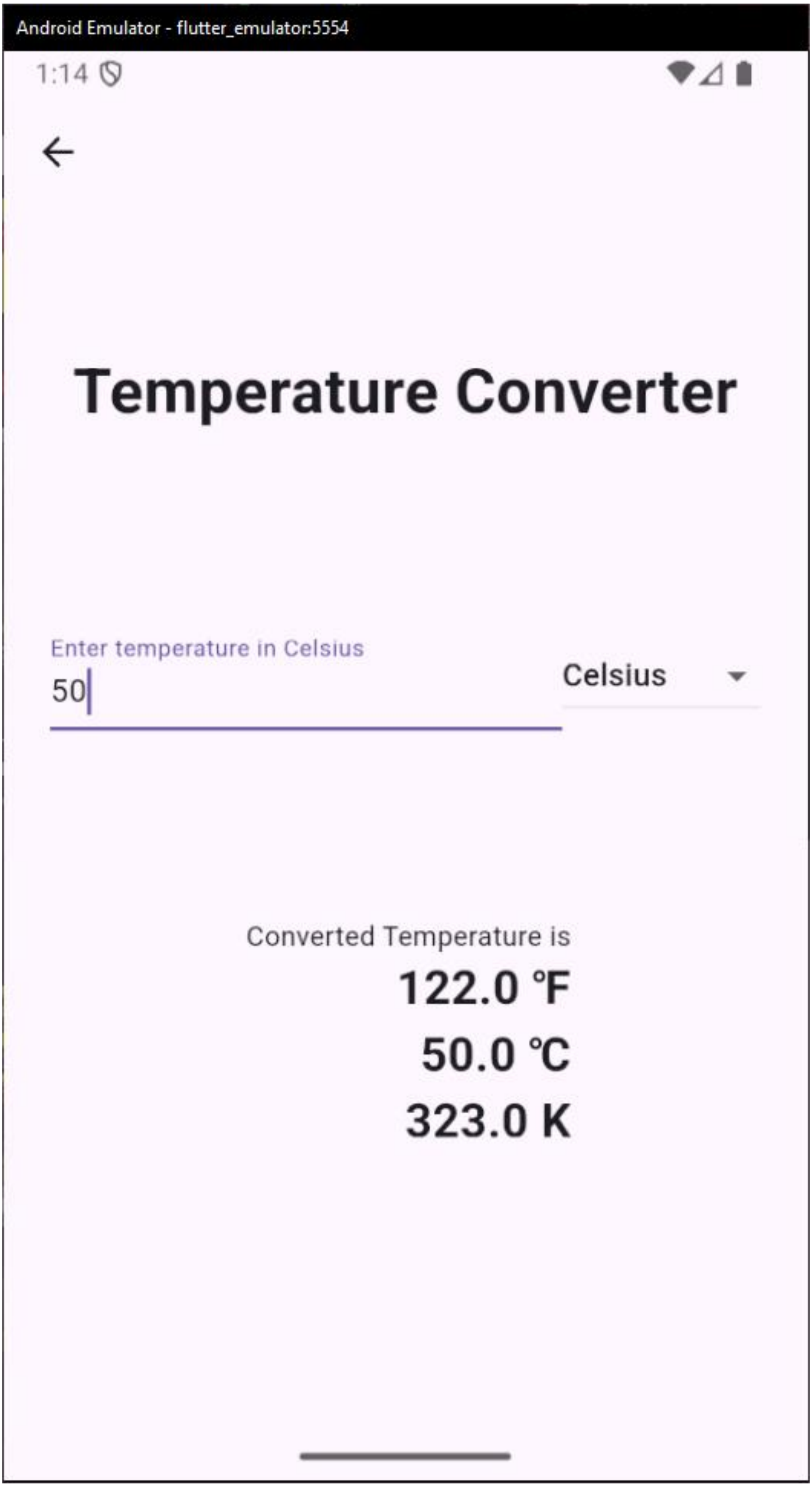
500

Enter exchange rate

0.0036

Converted Amount is

1.80$



Android Emulator - flutter_emulator:5554

1:14

Temperature Converter

Enter temperature in Celsius

50

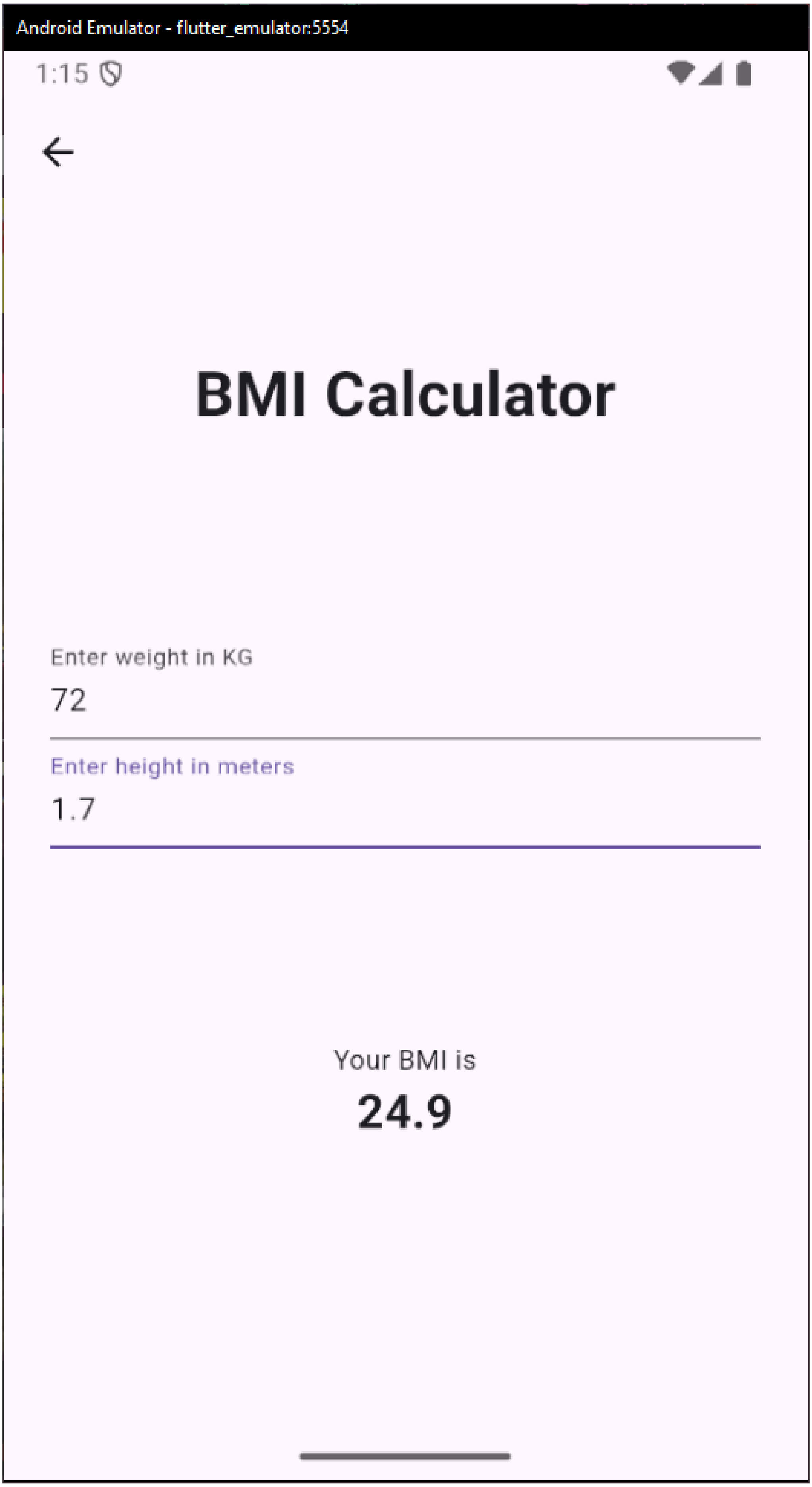
Celsius

Converted Temperature is

122.0 ℉

50.0 ℃

323.0 K



Android Emulator - flutter_emulator:5554

BMI Calculator

Enter weight in KG

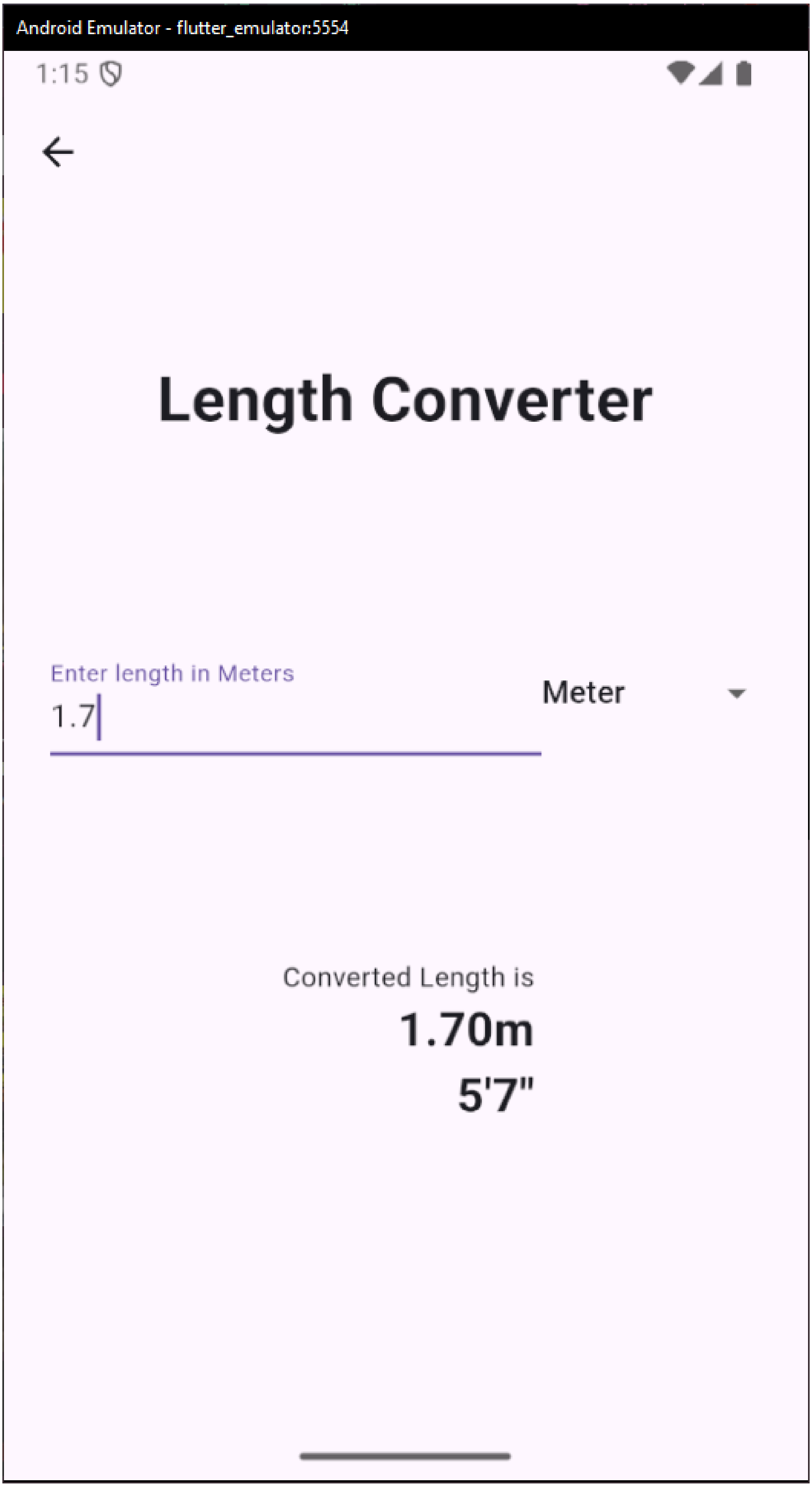
72

Enter height in meters

1.7

Your BMI is

24.9



Android Emulator - flutter_emulator:5554

Length Converter

Enter length in Meters

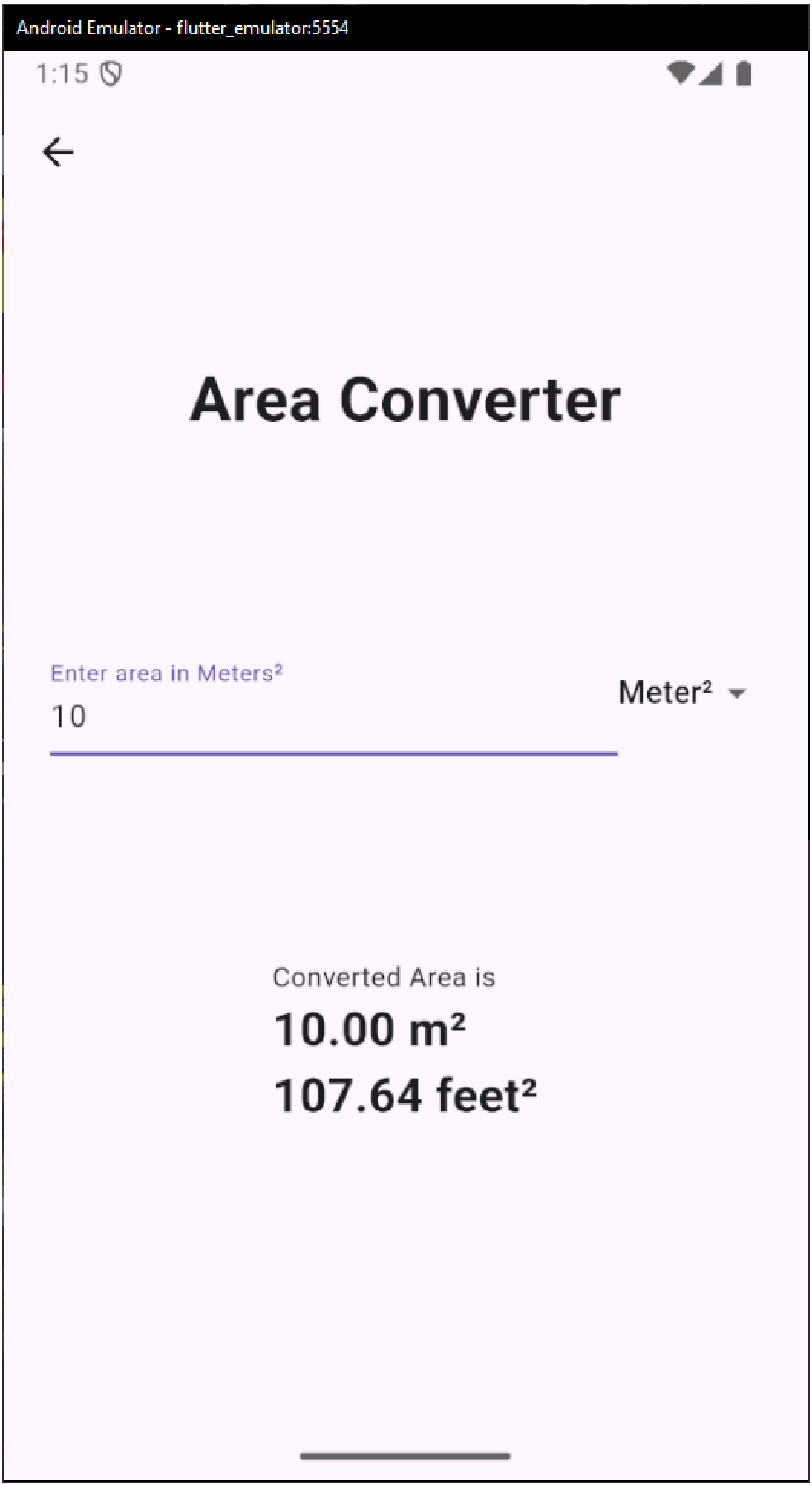
1.7

Meter

Converted Length is

1.70m

5'7"



Area Converter

Enter area in Meters²

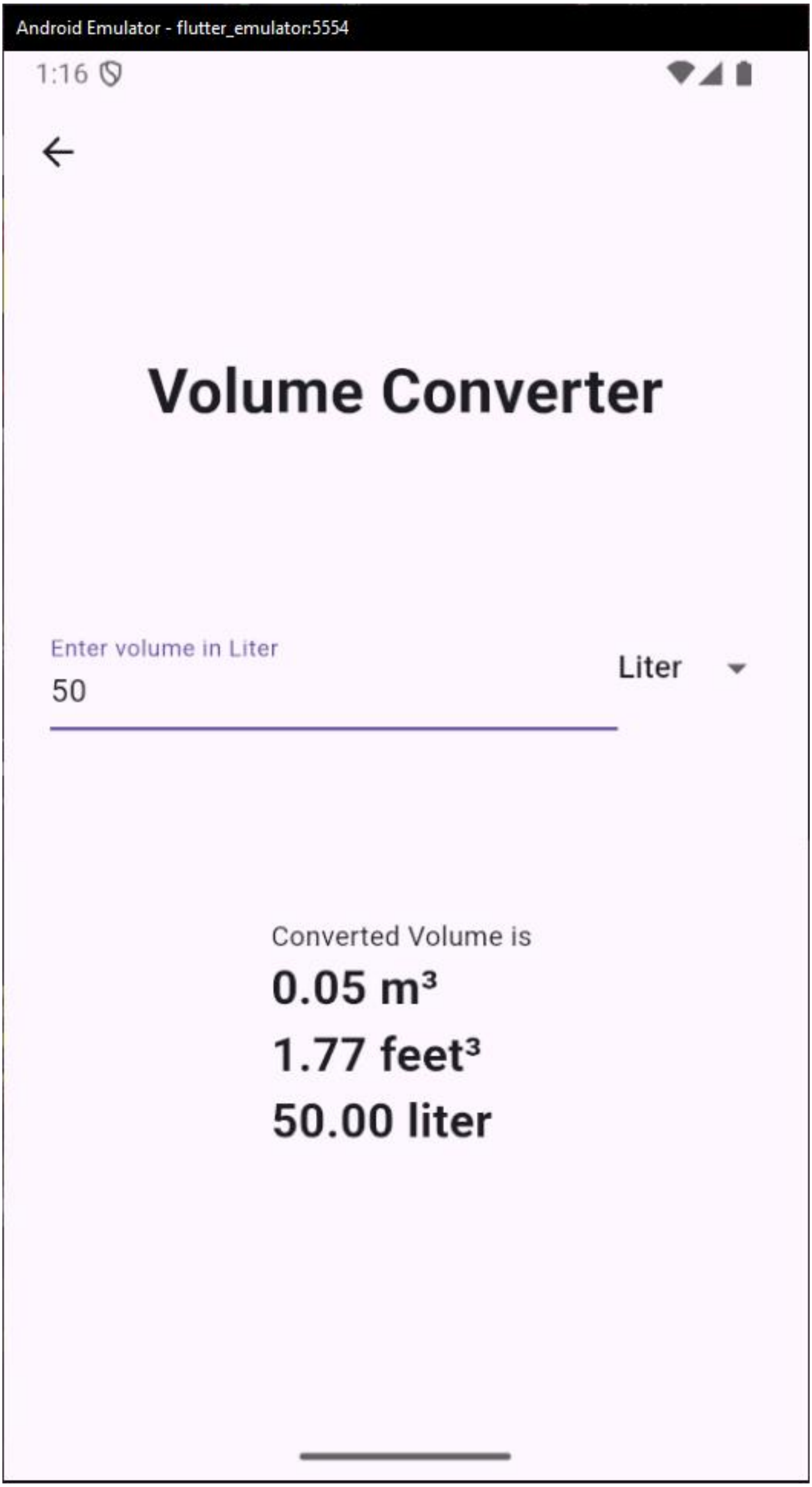
10

Meter²

Converted Area is

10.00 m²

107.64 feet²



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Volume Converter

Enter volume in Liter

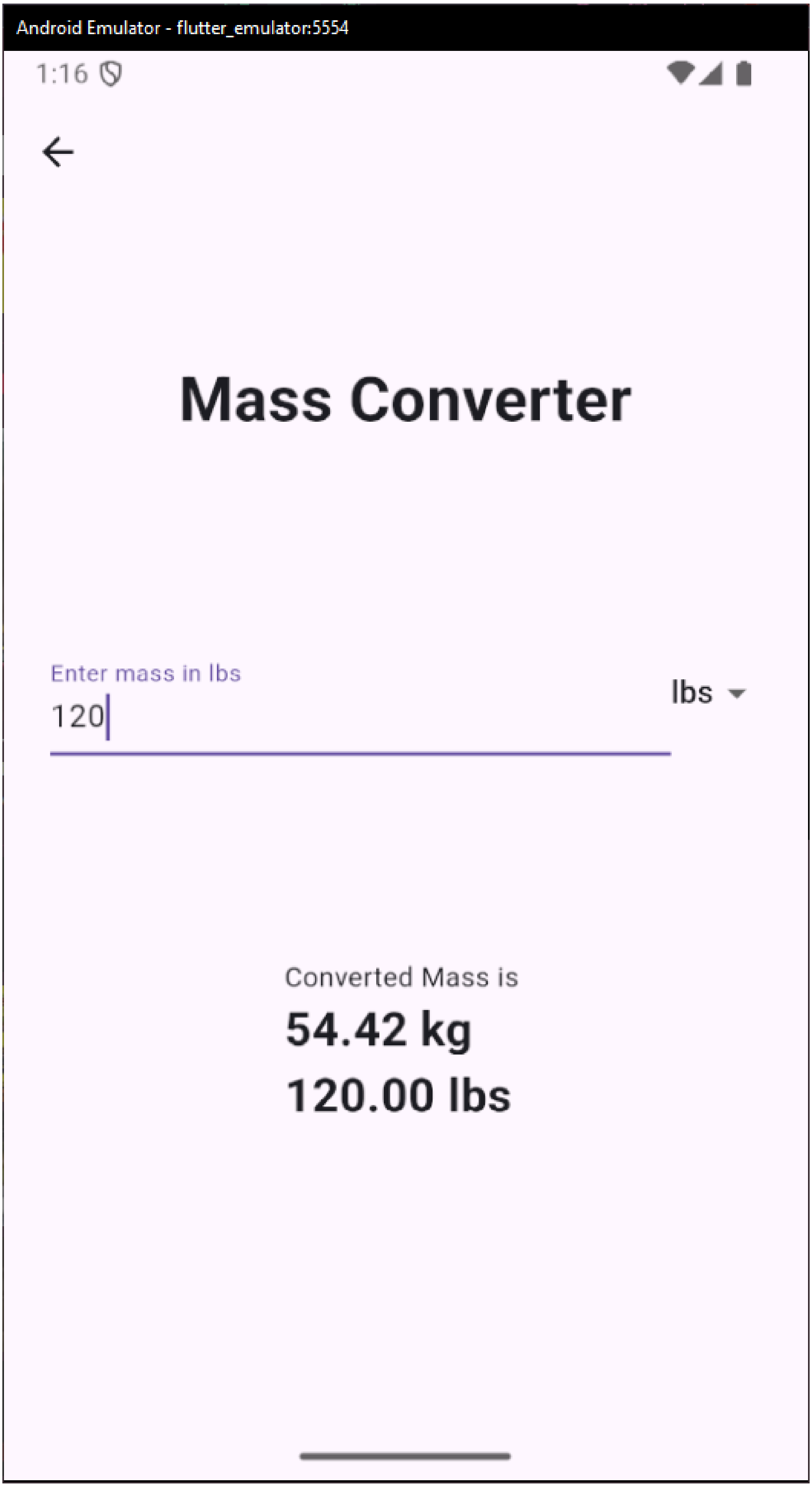
50

Converted Volume is

0.05 m^3

1.77 $feet^3$

50.00 liter



Android Emulator - flutter_emulator:5554

1:16

Mass Converter

Enter mass in lbs

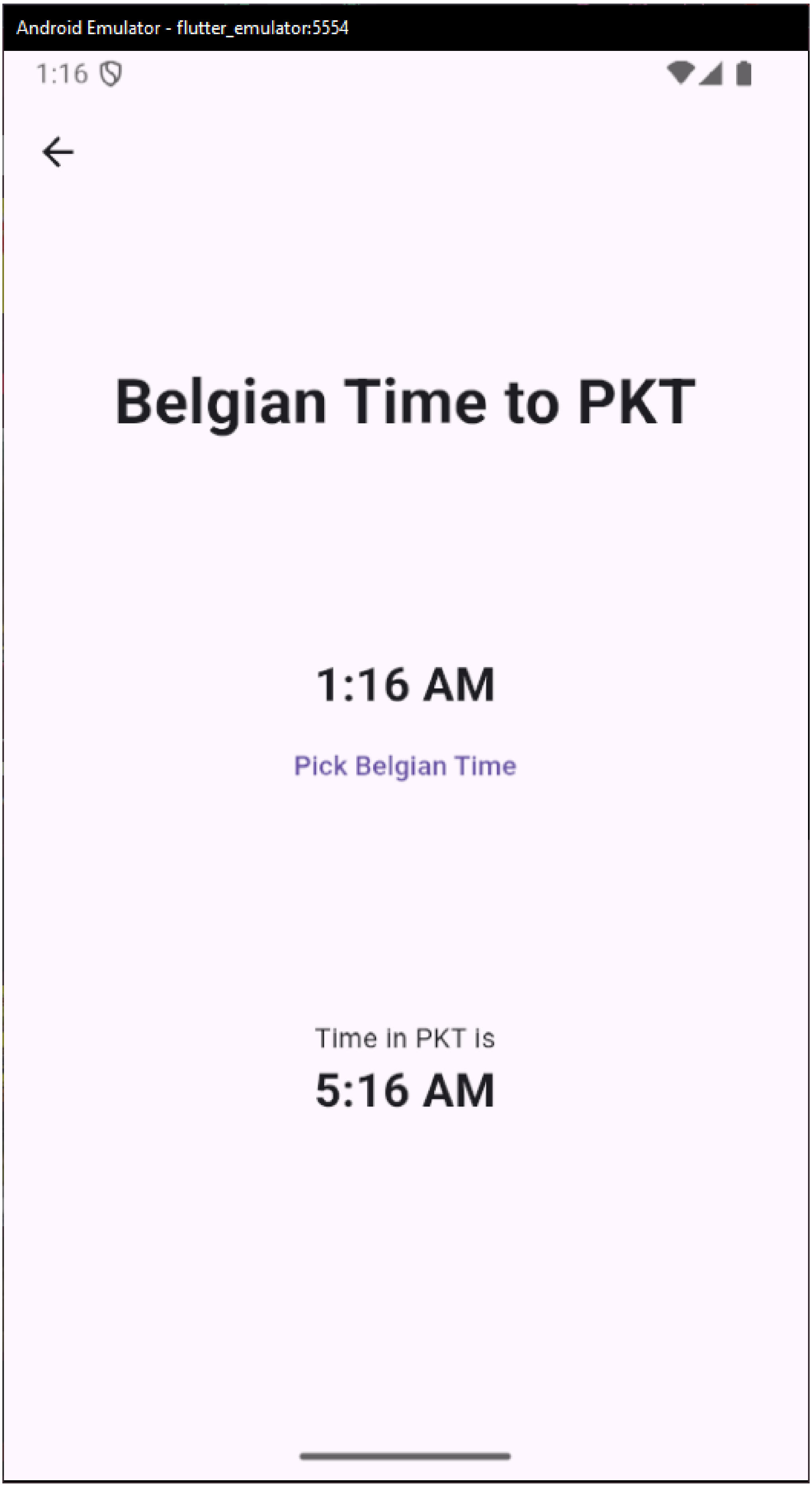
120

lbs

Converted Mass is

54.42 kg

120.00 lbs



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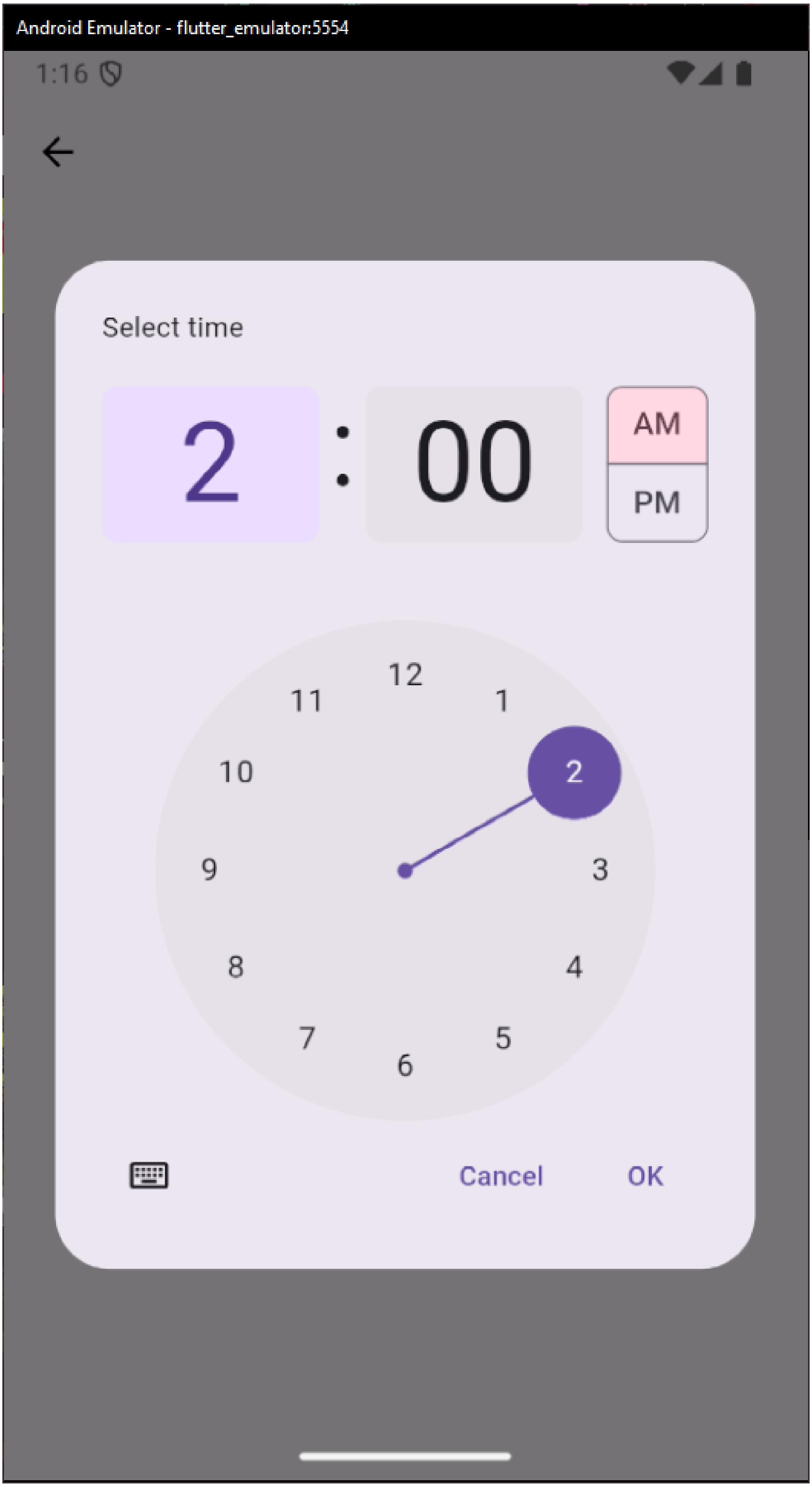
Belgian Time to PKT

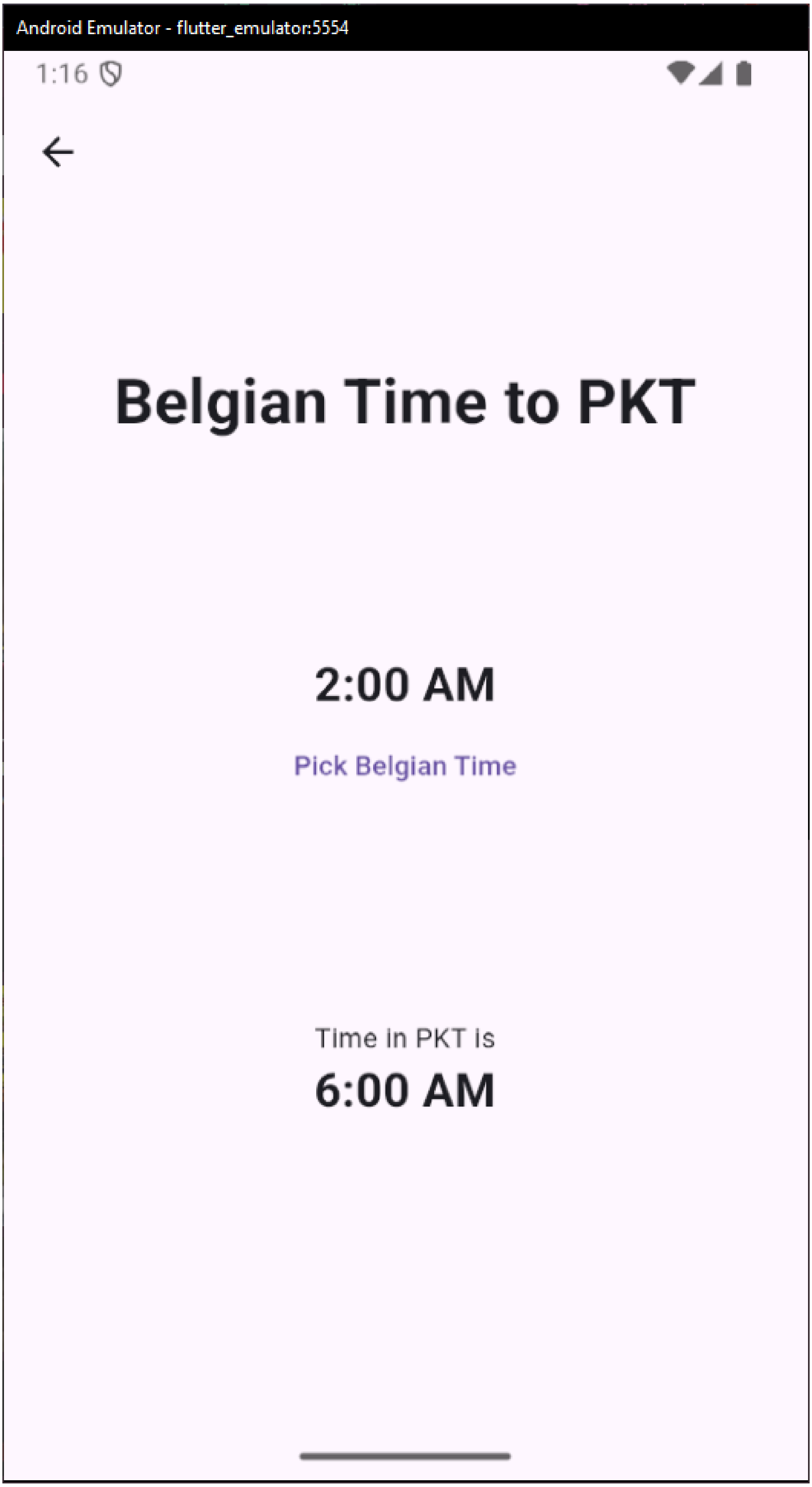
1:16 AM

Time in PKT is

5:16 AM



Android Emulator - flutter_emulator:5554
1:16
Select time
2
:
00
AM
PM
12
11
1
10
2
9
3
8
4
7
5
6
Cancel
OK



Android Emulator - flutter_emulator:5554

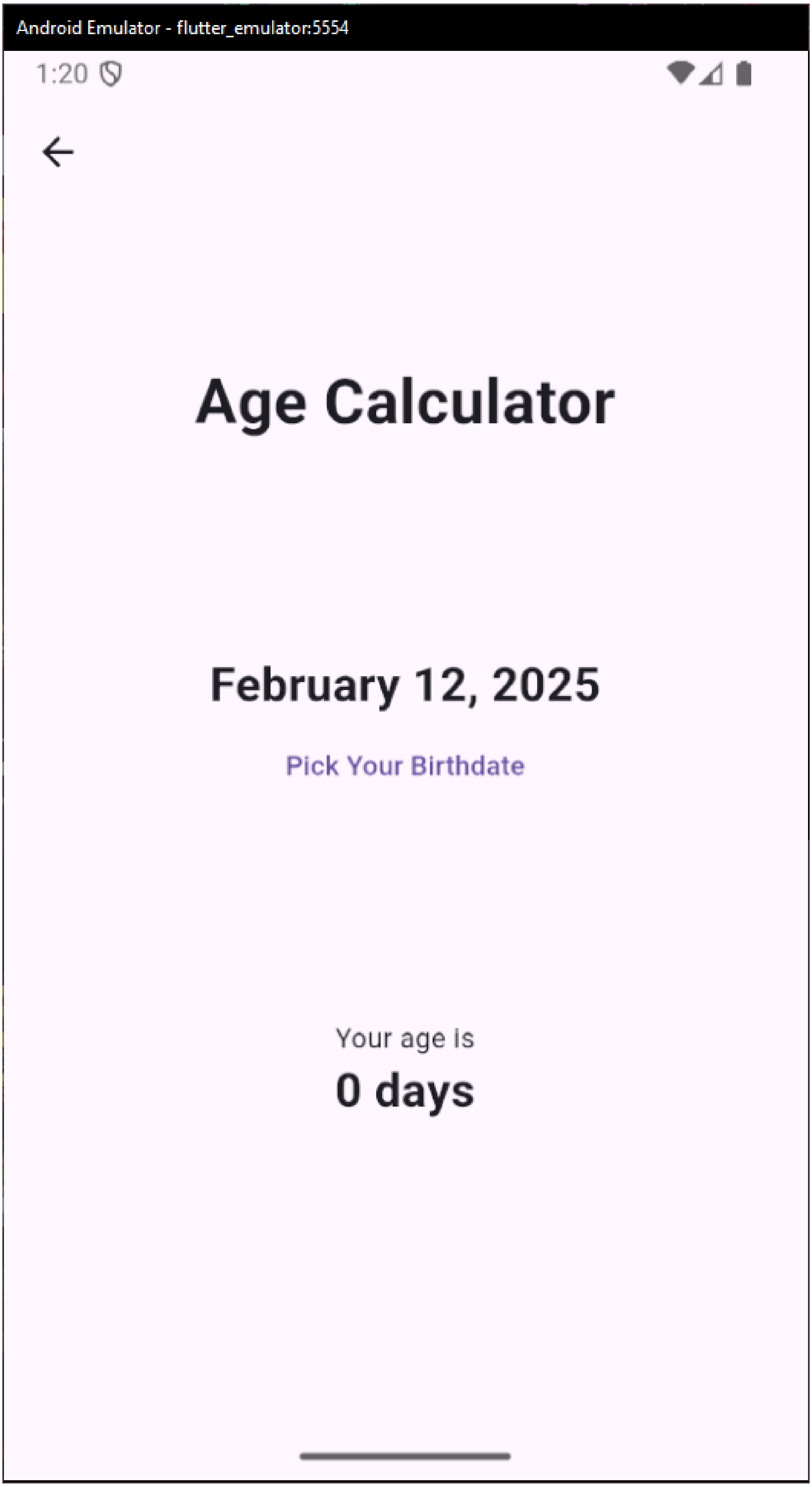
1:16

Belgian Time to PKT

2:00 AM

Time in PKT is

6:00 AM

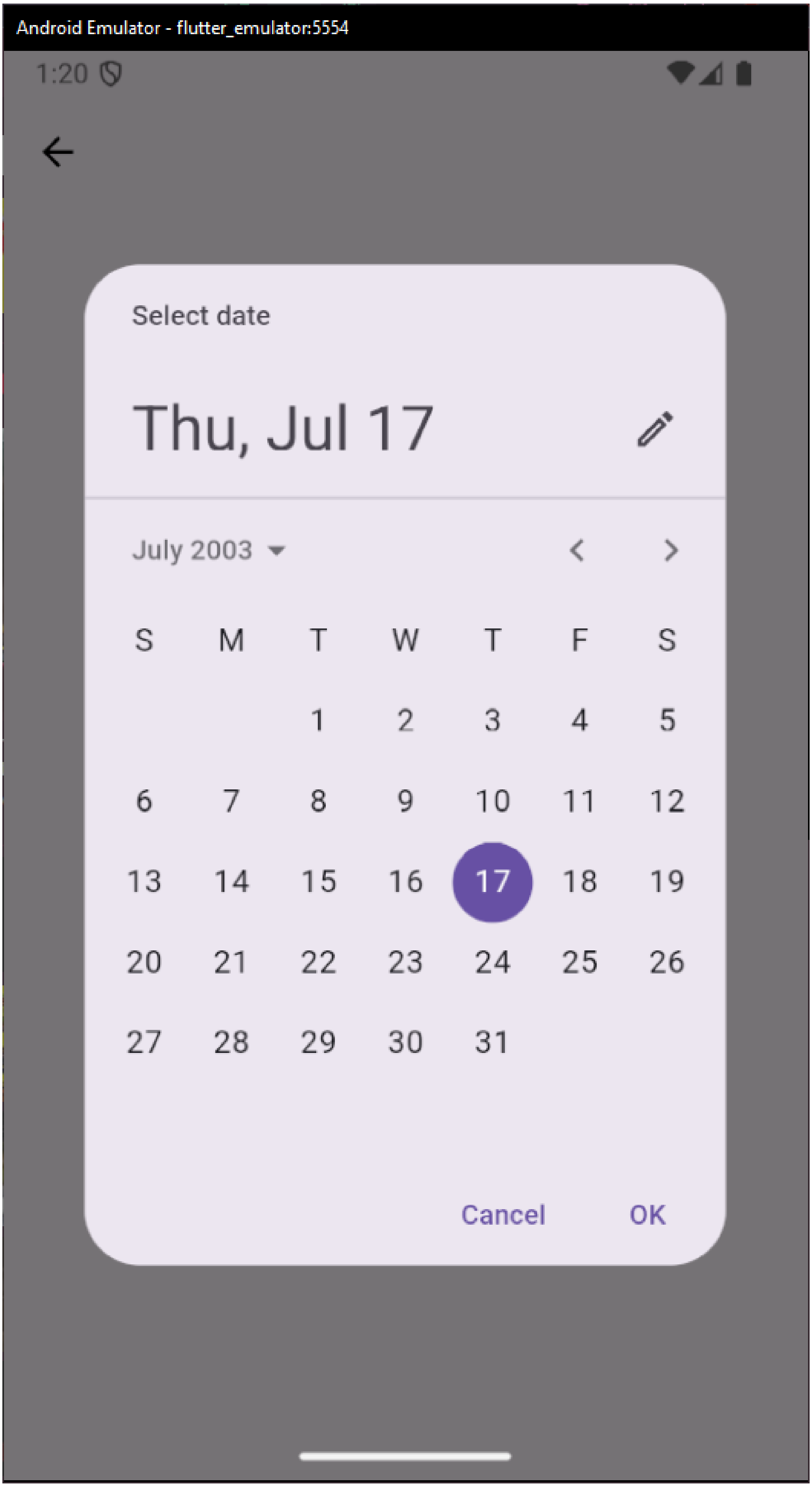


Age Calculator

February 12, 2025

Your age is

0 days



Android Emulator - flutter_emulator:5554

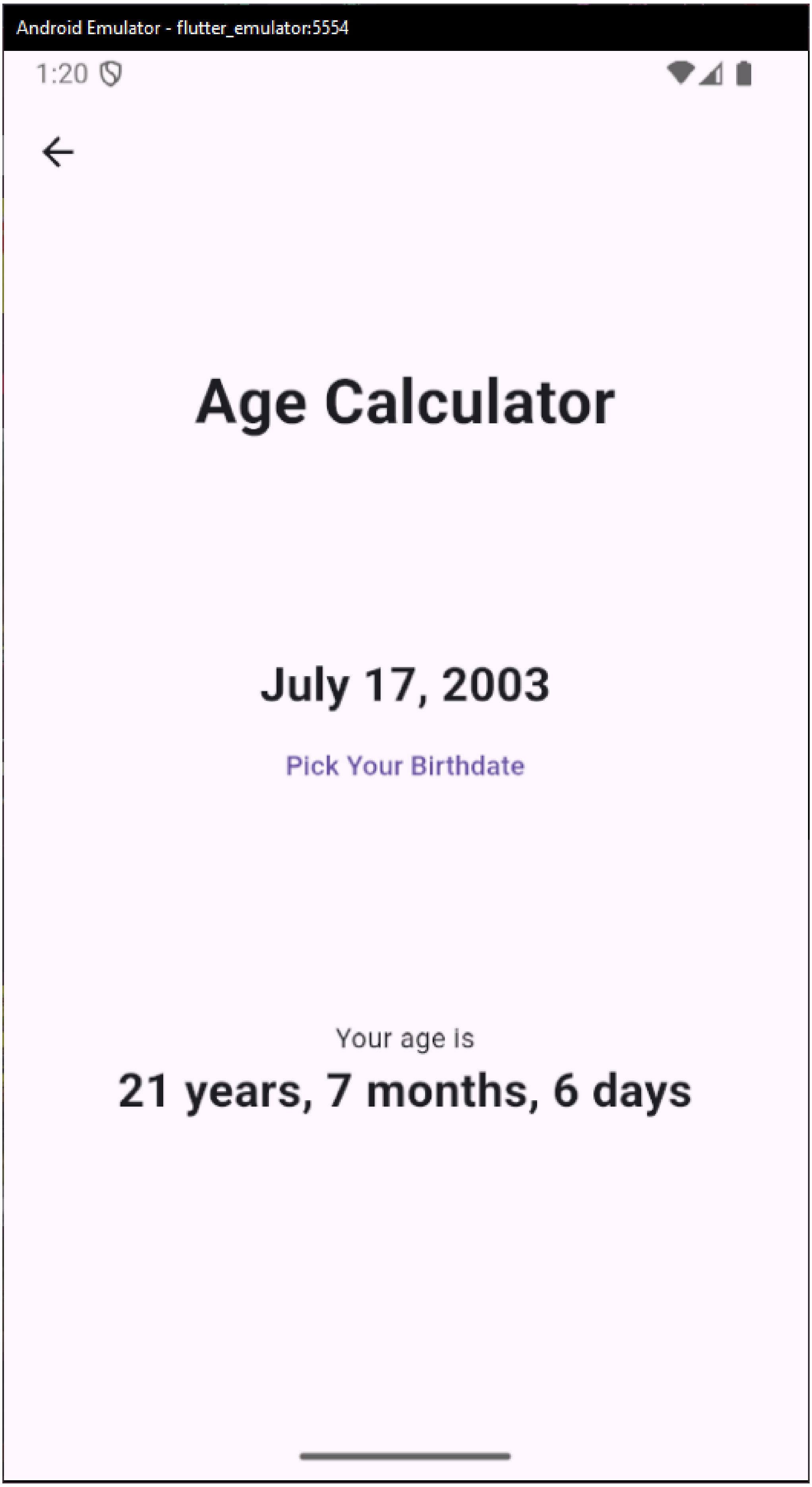
1:20

Select date

Thu, Jul 17

July 2003

S	M	T	W	T	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

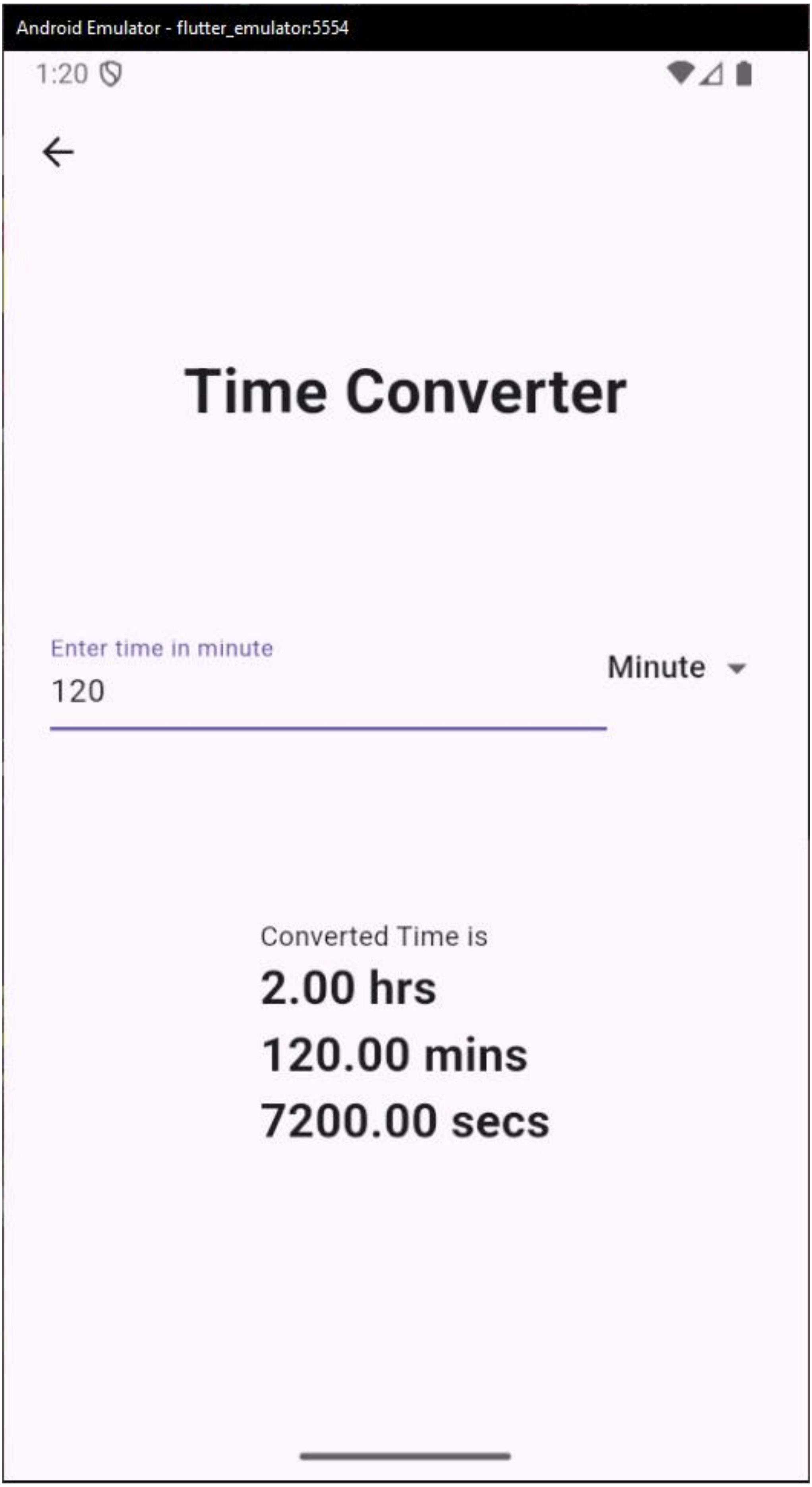


Age Calculator

July 17, 2003

Your age is

21 years, 7 months, 6 days



Time Converter

Enter time in minute

120

Minute

Converted Time is

2.00 hrs

120.00 mins

7200.00 secs

Code

```
import 'package:assignment_2_q_2/pages/home_page.dart';
import 'package:flutter/material.dart';

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

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

  @override
  Widget build(BuildContext context) {
    return MaterialApp(
      debugShowCheckedModeBanner: false,
      home: HomePage(),
    );
  }
}

import 'package:assignment_2_q_2/pages/calculator_pages/age_page.dart';
import 'package:assignment_2_q_2/pages/calculator_pages/area_page.dart';
import 'package:assignment_2_q_2/pages/calculator_pages/bmi_page.dart';
import 'package:assignment_2_q_2/pages/calculator_pages/currency_page.dart';
import 'package:assignment_2_q_2/pages/calculator_pages/friendship_page.dart';
import 'package:assignment_2_q_2/pages/calculator_pages/length_page.dart';
import
'package:assignment_2_q_2/pages/calculator_pages/temperature_page.dart';
import 'package:assignment_2_q_2/pages/calculator_pages/time_b_page.dart';
import 'package:assignment_2_q_2/pages/calculator_pages/time_h_page.dart';
import 'package:assignment_2_q_2/pages/calculator_pages/volume_page.dart';
import 'package:assignment_2_q_2/pages/calculator_pages/weight_page.dart';
import 'package:flutter/material.dart';

class Page {
  final String title;
  final Widget page;
  const Page({
    required this.title,
    required this.page,
  });
}

class HomePage extends StatelessWidget {
  HomePage({
    super.key,
  });
  final List<Page> pageList = [
    Page(title: "Friendship Calculator", page: FriendshipPage()),
    Page(title: "Currency Converter", page: CurrencyPage()),
    Page(title: "Temperature Converter", page: TemperaturePage()),
    Page(title: "BMI Converter", page: BmiPage()),
    Page(title: "Length Converter", page: LengthPage()),
    Page(title: "Area Converter", page: AreaPage()),
    Page(title: "Volume Converter", page: VolumePage()),
    Page(title: "Weight Converter", page: WeightPage()),
    Page(title: "Belgian Time to PKT Converter", page: TimeOfDayPage()),
    Page(title: "Age Calculator", page: AgePage()),
    Page(title: "Time Converter", page: TimePage()),
  ];

  @override
  Widget build(BuildContext context) {
    return Scaffold(
      appBar: AppBar(
        title: Text("Converter"),
      ),
      body: ListView.builder(
        itemCount: pageList.length,
        itemBuilder: (context, index) => GestureDetector(
          onTap: () {
            Navigator.push(
              context,
              MaterialPageRoute(builder: (context) => pageList[index].page),
            );
          },
          child: Padding(
            padding: const EdgeInsets.symmetric(horizontal: 16, vertical: 4),
            child: Container(
              padding: EdgeInsets.all(16),
              decoration: BoxDecoration(
                color: Colors.blue,
                borderRadius: BorderRadius.circular(8),
              ),
              child: Text(
                pageList[index].title,
              ),
            ),
          ),
        ),
      ),
    );
  }
}
```

```
import 'dart:math';

import 'package:flutter/material.dart';

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

  @override
  State<FriendshipPage> createState() => _FriendshipPageState();
}

class _FriendshipPageState extends State<FriendshipPage> {
  int _friendship = 0;
  void _calculateFriendship(String? value) {
    setState(() {
      _friendship = Random().nextInt(30) + 70;
    });
  }

  @override
  Widget build(BuildContext context) {
    return Scaffold(
      appBar: AppBar(),
      body: Padding(
        padding: const EdgeInsets.all(24),
        child: Column(
          mainAxisSize: MainAxisSize.max,
          mainAxisAlignment: MainAxisAlignment.spaceAround,
          children: [
            Text(
              "Friendship Calculator",
              style: TextStyle(
                fontWeight: FontWeight.bold,
                fontSize: 32,
              ),
            ),
            Column(
              children: [
                TextField(
                  decoration: InputDecoration(
                    labelText: "Enter your name",
                  ),
                  onChanged: _calculateFriendship,
                ),
                TextField(
                  decoration: InputDecoration(
                    labelText: "Enter your friend's name",
                  ),
                  onChanged: _calculateFriendship,
                ),
              ],
            ),
            Text.rich(
              textAlign: TextAlign.center,
              TextSpan(
                text: "Your friendship is \n",
                children: [
                  TextSpan(
                    text: _friendship.toString(),
                    style: TextStyle(
                      fontWeight: FontWeight.bold,
                      fontSize: 24,
                    ),
                    children: [
                      TextSpan(text: "%"),
                    ],
                  ),
                ],
              ),
            ),
            Container(),
          ],
        ),
      ),
    );
  }
}

import 'package:flutter/material.dart';

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

  @override
  State<CurrencyPage> createState() => _CurrencyPageState();
}

class _CurrencyPageState extends State<CurrencyPage> {
  double _enteredAmount = 0;
  double _exchangeRate = 280;
  double _convertedAmount = 0;
  void _convertAmount() {
    _convertedAmount = _enteredAmount * _exchangeRate;
  }

  @override
```

```
Widget build(BuildContext context) {
  return Scaffold(
    appBar: AppBar(),
    body: Padding(
      padding: const EdgeInsets.all(24),
      child: Column(
        mainAxisSize: MainAxisSize.max,
        mainAxisAlignment: MainAxisAlignment.spaceAround,
        children: [
          Text(
            "Currency Converter",
            style: TextStyle(
              fontWeight: FontWeight.bold,
              fontSize: 32,
            ),
          ),
          Column(
            children: [
              TextField(
                keyboardType: TextInputType.number,
                decoration: InputDecoration(
                  labelText: "Enter amount",
                ),
                onChanged: (String? value) {
                  setState(() {
                    _enteredAmount = double.tryParse(value ?? "0") ?? 0;
                    _convertAmount();
                  });
                },
              ),
              TextField(
                keyboardType: TextInputType.number,
                decoration: InputDecoration(
                  labelText: "Enter exchange rate",
                ),
                onChanged: (String? value) {
                  setState(() {
                    _exchangeRate = double.tryParse(value ?? "0") ?? 0;
                    _convertAmount();
                  });
                },
              ),
            ],
          ),
          Text.rich(
            textAlign: TextAlign.center,
            TextSpan(
              text: "Converted Amount is \n",
                children: [
                  TextSpan(
                    text: _convertedAmount.toStringAsFixed(2),
                    style: TextStyle(
                      fontWeight: FontWeight.bold,
                      fontSize: 24,
                    ),
                    children: [
                      TextSpan(text: "\$"),
                    ],
                  ),
                ],
              ),
            ),
            Container(),
          ],
        ),
      ),
    );
  }
}

import 'package:flutter/material.dart';

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

  @override
  State<TemperaturePage> createState() => _TemperaturePageState();
}

class _TemperaturePageState extends State<TemperaturePage> {
  double _tempInF = 0;
  double _tempInC = 0;
  int _index = 0;
  double _enteredValue = 0;

  void _updateTemp() {
    setState(() {
      switch (_index) {
        case 0:
          _tempInC = _enteredValue;
          _tempInF = (_enteredValue * 9 / 5) + 32;
          break;

        case 1:
          _tempInF = _enteredValue;
          _tempInC = (_enteredValue - 32) * 5 / 9;
        break;

      case 2:
        _tempInC = _enteredValue - 273;
        _tempInF = (_tempInC * 9 / 5) + 32;
        break;
    }
  });
}

@override
Widget build(BuildContext context) {
  return Scaffold(
    appBar: AppBar(),
    body: Padding(
      padding: const EdgeInsets.all(24),
      child: Column(
        mainAxisSize: MainAxisSize.max,
        mainAxisAlignment: MainAxisAlignment.spaceAround,
        children: [
          Text(
            "Temperature Converter",
            style: TextStyle(
              fontWeight: FontWeight.bold,
              fontSize: 32,
            ),
          ),
          Row(
            crossAxisAlignment: CrossAxisAlignment.center,
            mainAxisSize: MainAxisSize.min,
            children: [
              Expanded(
                child: TextField(
                  keyboardType: TextInputType.number,
                  decoration: InputDecoration(
                    labelText: "Enter temperature in ${[
                      "Celsius",
                      "Farenheit",
                      "Kelvin"
                    ][_index]}",
                  ),
                  onChanged: (String? value) {
                    _enteredValue = double.tryParse(value ?? "0") ?? 0;
                    _updateTemp();
                  },
                ),
              ),
              DropdownButton(
         value: _index,
         items: [
          DropdownMenuItem(
           value: 0,
           child: Text("Celsius"),
          ),
          DropdownMenuItem(
           value: 1,
           child: Text("Fahrenheit"),
          ),
          DropdownMenuItem(
           value: 2,
           child: Text("Kelvin"),
          ),
         ],
         onChanged: (index) {
          _index = index ?? 0;
          _updateTemp();
         },
        ),
       ],
      ),
      Text.rich(
       textAlign: TextAlign.end,
       TextSpan(
        text: "Converted Temperature is \n",
        children: [
         TextSpan(
          text:
            "${_tempInF.toStringAsFixed(1)}
°F\n${_tempInC.toStringAsFixed(1)} °C\n${(_tempInC + 273).toStringAsFixed(1)}
K",
          style: TextStyle(
           fontWeight: FontWeight.bold,
           fontSize: 24,
          ),
         ),
        ],
       ),
      ),
      Container(),
     ],
    ),
   ),
  );
 }
}
```

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

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

  @override
  State<BmiPage> createState() => _BmiPageState();
}

class _BmiPageState extends State<BmiPage> {
  double _weightInKg = 0;
  double _heightInMeter = 280;
  double _bmi = 0;
  void _calculateBMI() {
    _bmi = _weightInKg / (_heightInMeter * _heightInMeter);
  }

  @override
  Widget build(BuildContext context) {
    return Scaffold(
      appBar: AppBar(),
      body: Padding(
        padding: const EdgeInsets.all(24),
        child: Column(
          mainAxisSize: MainAxisSize.max,
          mainAxisAlignment: MainAxisAlignment.spaceAround,
          children: [
            Text(
              "BMI Calculator",
              style: TextStyle(
                fontWeight: FontWeight.bold,
                fontSize: 32,
              ),
            ),
            Column(
              children: [
                TextField(
                  keyboardType: TextInputType.number,
                  decoration: InputDecoration(
                    labelText: "Enter weight in KG",
                  ),
                  onChanged: (String? value) {
                    setState(() {
                      _weightInKg = double.tryParse(value ?? "0") ?? 0;
                      _calculateBMI();
                    });
                  },
                ),
                TextField(
                  keyboardType: TextInputType.number,
                  decoration: InputDecoration(
                    labelText: "Enter height in meters",
                  ),
                  onChanged: (String? value) {
                    setState(() {
                      _heightInMeter = double.tryParse(value ?? "0") ?? 0;
                      _calculateBMI();
                    });
                  },
                ),
              ],
            ),
            Text.rich(
              textAlign: TextAlign.center,
              TextSpan(
                text: "Your BMI is \n",
                children: [
                  TextSpan(
                    text: _bmi.toStringAsFixed(1),
                    style: TextStyle(
                      fontWeight: FontWeight.bold,
                      fontSize: 24,
                    ),
                  ),
                ],
              ),
            ),
            Container(),
          ],
        ),
      ),
    );
  }
}

import 'package:flutter/material.dart';

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

  @override
  State<LengthPage> createState() => _LengthPageState();
}

class _LengthPageState extends State<LengthPage> {
  double _lengthInMeter = 0;
  double _lengthInInches = 0;
  int _index = 0;
  double _enteredValue = 0;
  double _enteredInches = 0;

  void _updateLength() {
    setState(() {
      switch (_index) {
        case 0:
          _lengthInMeter = _enteredValue;
          _lengthInInches = _enteredValue * 39.37;
          break;

        case 1:
          _lengthInInches = (_enteredValue * 12) + _enteredInches;
          _lengthInMeter = _lengthInInches / 39.37;
          break;
      }
    });
  }

  @override
  Widget build(BuildContext context) {
    return Scaffold(
      appBar: AppBar(),
      body: Padding(
        padding: const EdgeInsets.all(24),
        child: Column(
          mainAxisSize: MainAxisSize.max,
          mainAxisAlignment: MainAxisAlignment.spaceAround,
          children: [
            Text(
              "Length Converter",
              style: TextStyle(
                fontWeight: FontWeight.bold,
                fontSize: 32,
              ),
            ),
            Row(
              crossAxisAlignment: CrossAxisAlignment.start,
              mainAxisSize: MainAxisSize.min,
              children: [
                Expanded(
                  child: Column(
                    children: [
                      TextField(
                        keyboardType: TextInputType.number,
                        decoration: InputDecoration(
                          labelText: "Enter length in ${[
                            "Meters",
                            "Feet",
                          ][_index]}",
                        ),
                        onChanged: (String? value) {
                          _enteredValue = double.tryParse(value ?? "0") ?? 0;
                          _updateLength();
                        },
                      ),
                      if (_index == 1)
                        TextField(
                          keyboardType: TextInputType.number,
                          decoration: InputDecoration(
                            labelText: "Inches",
                          ),
                          onChanged: (String? value) {
                            _enteredInches = double.tryParse(value ?? "0") ??
0;

                            _updateLength();
                          },
                        ),
                    ],
                  ),
                ),
                DropdownButton(
                  underline: Container(),
                  value: _index,
                  items: [
                    DropdownMenuItem(
                      value: 0,
                      child: Text("Meter"),
                    ),
                    DropdownMenuItem(
                      value: 1,
                      child: Text("Feet, Inches"),
                    ),
                  ],
                  onChanged: (index) {
                    _index = index ?? 0;
                    _updateLength();
                  },
                ),
              ],
            ),
            Text.rich(
              textAlign: TextAlign.end,
              TextSpan(
                text: "Converted Length is \n",
                children: [
                  TextSpan(
                    text:
                        "${_lengthInMeter.toStringAsFixed(2)}m\n${((_lengthInI
nches / 12).toInt()).toStringAsFixed(0)}'${(_lengthInInches %
12).toStringAsFixed(0)}\"",
                    style: TextStyle(
                      fontWeight: FontWeight.bold,
                      fontSize: 24,
                    ),
                  ),
                ],
              ),
            ),
            Container(),
          ],
        ),
      ),
    );
  }
}

import 'package:flutter/material.dart';

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

  @override
  State<AreaPage> createState() => _AreaPageState();
}

class _AreaPageState extends State<AreaPage> {
  double _areaInMeter2 = 0;
  double _areaInFeet2 = 0;
  int _index = 0;
  double _enteredValue = 0;

  void _updateArea() {
    setState(() {
      switch (_index) {
        case 0:
          _areaInMeter2 = _enteredValue;
          _areaInFeet2 = _enteredValue * 10.764;
          break;

        case 1:
          _areaInFeet2 = _enteredValue;
          _areaInMeter2 = _enteredValue / 10.764;
          break;
      }
    });
  }

  @override
  Widget build(BuildContext context) {
    return Scaffold(
      appBar: AppBar(),
      body: Padding(
        padding: const EdgeInsets.all(24),
        child: Column(
          mainAxisSize: MainAxisSize.max,
          mainAxisAlignment: MainAxisAlignment.spaceAround,
          children: [
            Text(
              "Area Converter",
              style: TextStyle(
                fontWeight: FontWeight.bold,
                fontSize: 32,
              ),
            ),
            Row(
              crossAxisAlignment: CrossAxisAlignment.start,
              mainAxisSize: MainAxisSize.min,
              children: [
                Expanded(
                  child: TextField(
                    keyboardType: TextInputType.number,
                    decoration: InputDecoration(
                      labelText: "Enter area in ${[
                        "Meters",
                        "Feet",
                      ][_index]}²",
                    ),
                    onChanged: (String? value) {
                      _enteredValue = double.tryParse(value ?? "0") ?? 0;
                      _updateArea();
                    },
                  ),
                ),
                DropdownButton(
                  underline: Container(),
                  value: _index,
                  items: [
                    DropdownMenuItem(
                      value: 0,
                      child: Text("Meter²"),
                    ),
                    DropdownMenuItem(
                      value: 1,
                      child: Text("Feet²"),
                    ),
                  ],
                  onChanged: (index) {
                    _index = index ?? 0;
                    _updateArea();
                  },
                ),
              ],
            ),
            Text.rich(
              textAlign: TextAlign.start,
              TextSpan(
                text: "Converted Area is \n",
                children: [
                  TextSpan(
                    text:
                        "${_areaInMeter2.toStringAsFixed(2)}
m²\n${_areaInFeet2.toStringAsFixed(2)} feet²",
                    style: TextStyle(
                      fontWeight: FontWeight.bold,
                      fontSize: 24,
                    ),
                  ),
                ],
              ),
            ),
            Container(),
          ],
        ),
      ),
    );
  }
}

import 'package:flutter/material.dart';

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

  @override
  State<VolumePage> createState() => _VolumePageState();
}
```

```
class _VolumePageState extends State<VolumePage> {
  double _volumeInMeter3 = 0;
  double _volumeInFeet3 = 0;
  double _volumeInLiter = 0;
  int _index = 0;
  double _enteredValue = 0;

  void _updateVolume() {
    setState(() {
      switch (_index) {
        case 0:
          _volumeInMeter3 = _enteredValue;
          _volumeInFeet3 = _enteredValue * 35.315;
          _volumeInLiter = _enteredValue * 1000;
          break;

        case 1:
          _volumeInFeet3 = _enteredValue;
          _volumeInMeter3 = _enteredValue / 35.315;
          _volumeInLiter = _enteredValue * 28.31;
          break;

        case 2:
          _volumeInLiter = _enteredValue;
          _volumeInMeter3 = _enteredValue / 1000;
          _volumeInFeet3 = _enteredValue / 28.31;
          break;
      }
    });
  }

  @override
  Widget build(BuildContext context) {
    return Scaffold(
      appBar: AppBar(),
      body: Padding(
        padding: const EdgeInsets.all(24),
        child: Column(
          mainAxisSize: MainAxisSize.max,
          mainAxisAlignment: MainAxisAlignment.spaceAround,
          children: [
            Text(
              "Volume Converter",
              style: TextStyle(
                fontWeight: FontWeight.bold,
                fontSize: 32,
              ),
            ),
            Row(
              crossAxisAlignment: CrossAxisAlignment.start,
              mainAxisSize: MainAxisSize.min,
              children: [
                Expanded(
                  child: TextField(
                    keyboardType: TextInputType.number,
                    decoration: InputDecoration(
                      labelText: "Enter volume in ${[
                        "Meters",
                        "Feet",
                        "Liter",
                      ][_index]}${_index != 2 ? '³' : ''}",
                    ),
                    onChanged: (String? value) {
                      _enteredValue = double.tryParse(value ?? "0") ?? 0;
                      _updateVolume();
                    },
                  ),
                ),
                DropdownButton(
                  underline: Container(),
                  value: _index,
                  items: [
                    DropdownMenuItem(
                      value: 0,
                      child: Text("Meter³"),
                    ),
                    DropdownMenuItem(
                      value: 1,
                      child: Text("Feet³"),
                    ),
                    DropdownMenuItem(
                      value: 2,
                      child: Text("Liter"),
                    ),
                  ],
                  onChanged: (index) {
                    _index = index ?? 0;
                    _updateVolume();
                  },
                ),
              ],
            ),
            Text.rich(
              textAlign: TextAlign.start,
              TextSpan(
                text: "Converted Volume is \n",
                            children: [
                              TextSpan(
                                text:
                                    "${_volumeInMeter3.toStringAsFixed(2)}
            m³\n${_volumeInFeet3.toStringAsFixed(2)} feet³
            \n${_volumeInLiter.toStringAsFixed(2)} liter",
                                style: TextStyle(
                                  fontWeight: FontWeight.bold,
                                  fontSize: 24,
                                ),
                              ),
                            ],
                          ),
                        ),
                        Container(),
                      ],
                    ),
                  ),
                );
              }
            }

            import 'package:flutter/material.dart';

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

              @override
              State<WeightPage> createState() => _WeightPageState();
            }

            class _WeightPageState extends State<WeightPage> {
              double _massInKg = 0;
              double _massInLbs = 0;
              int _index = 0;
              double _enteredValue = 0;

              void _updateMass() {
                setState(() {
                  switch (_index) {
                    case 0:
                      _massInKg = _enteredValue;
                      _massInLbs = _enteredValue * 2.205;
                      break;

                    case 1:
                      _massInLbs = _enteredValue;
                      _massInKg = _enteredValue / 2.205;
                    break;
                }
              });
            }

            @override
            Widget build(BuildContext context) {
              return Scaffold(
                appBar: AppBar(),
                body: Padding(
                  padding: const EdgeInsets.all(24),
                  child: Column(
                    mainAxisSize: MainAxisSize.max,
                    mainAxisAlignment: MainAxisAlignment.spaceAround,
                    children: [
                      Text(
                        "Mass Converter",
                        style: TextStyle(
                          fontWeight: FontWeight.bold,
                          fontSize: 32,
                        ),
                      ),
                      Row(
                        crossAxisAlignment: CrossAxisAlignment.start,
                        mainAxisSize: MainAxisSize.min,
                        children: [
                          Expanded(
                            child: TextField(
                              keyboardType: TextInputType.number,
                              decoration: InputDecoration(
                                labelText: "Enter mass in ${[
                                  "kg",
                                  "lbs",
                                ][_index]}",
                              ),
                              onChanged: (String? value) {
                                _enteredValue = double.tryParse(value ?? "0") ?? 0;
                                _updateMass();
                              },
                            ),
                          ),
                          DropdownButton(
                            underline: Container(),
                            value: _index,
                            items: [
                              DropdownMenuItem(
                                value: 0,
                                child: Text("kg"),
                                ),
                                DropdownMenuItem(
                                  value: 1,
                                  child: Text("lbs"),
                                ),
                              ],
                              onChanged: (index) {
                                _index = index ?? 0;
                                _updateMass();
                              },
                            ),
                          ],
                        ),
                        Text.rich(
                          textAlign: TextAlign.start,
                          TextSpan(
                            text: "Converted Mass is \n",
                            children: [
                              TextSpan(
                                text:
                                    "${_massInKg.toStringAsFixed(2)}
            kg\n${_massInLbs.toStringAsFixed(2)} lbs",
                                style: TextStyle(
                                  fontWeight: FontWeight.bold,
                                  fontSize: 24,
                                ),
                              ),
                            ],
                          ),
                        ),
                        Container(),
                      ],
                    ),
                  ),
                );
              }
            }

            import 'package:flutter/material.dart';

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

              @override
              State<TimeOfDayPage> createState() => _TimeOfDayPageState();
            }

            class _TimeOfDayPageState extends State<TimeOfDayPage> {
```

```dart
TimeOfDay _time = TimeOfDay.now();
TimeOfDay _convertedTime = TimeOfDay.now();
@override
Widget build(BuildContext context) {
  return Scaffold(
    appBar: AppBar(),
    body: Padding(
      padding: const EdgeInsets.all(24),
      child: Column(
        mainAxisSize: MainAxisSize.max,
        mainAxisAlignment: MainAxisAlignment.spaceAround,
        children: [
          Text(
            "Belgian Time to PKT",
            style: TextStyle(
              fontWeight: FontWeight.bold,
              fontSize: 32,
            ),
          ),
          Column(
            children: [
              Text(
                _time.format(context),
                style: TextStyle(
                  fontWeight: FontWeight.bold,
                  fontSize: 24,
                ),
              ),
              TextButton(
                onPressed: () async {
                  _time = await showTimePicker(
                          context: context, initialTime: _time) ??
                      TimeOfDay.now();
                  setState(() {
                    _convertedTime = _convertedTime.replacing(
                      hour: (_time.hour + 4) % 24,
                      minute: _time.minute,
                    );
                  });
                },
                child: Text("Pick Belgian Time"),
              ),
            ],
          ),
          Text.rich(
            textAlign: TextAlign.center,
            TextSpan(
              text: "Time in PKT is \n",
                children: [
                  TextSpan(
                    text: _convertedTime.format(context),
                    style: TextStyle(
                      fontWeight: FontWeight.bold,
                      fontSize: 24,
                    ),
                  ),
                ],
              ),
            ),
            Container(),
          ],
        ),
      ),
    );
  }
}

import 'package:flutter/material.dart';

extension on DateTime {
  String formatDate() {
    const List<String> months = [
      "January",
      "February",
      "March",
      "April",
      "May",
      "June",
      "July",
      "August",
      "September",
      "October",
      "November",
      "December"
    ];

    String month = months[this.month - 1];
    return "$month $day, $year";
  }
}

extension on Duration {
  String formatAge() {
    int totalDays = inDays;
    int years = totalDays ~/ 365;
    int remainingDaysAfterYears = totalDays % 365;
    int months = remainingDaysAfterYears ~/ 30;
    int days = remainingDaysAfterYears % 30;

    List<String> parts = [];

    if (years > 0) parts.add('$years year${years > 1 ? 's' : ''}');
    if (months > 0) parts.add('$months month${months > 1 ? 's' : ''}');
    if (days > 0) parts.add('$days day${days > 1 ? 's' : ''}');

    return parts.isNotEmpty ? parts.join(', ') : '0 days';
  }
}

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

  @override
  State<AgePage> createState() => _AgePageState();
}

class _AgePageState extends State<AgePage> {
  DateTime _date = DateTime.now();
  Duration _convertedDate = Duration();
  @override
  Widget build(BuildContext context) {
    return Scaffold(
      appBar: AppBar(),
      body: Padding(
        padding: const EdgeInsets.all(24),
        child: Column(
          mainAxisSize: MainAxisSize.max,
          mainAxisAlignment: MainAxisAlignment.spaceAround,
          children: [
            Text(
              "Age Calculator",
              style: TextStyle(
                fontWeight: FontWeight.bold,
                fontSize: 32,
              ),
            ),
            Column(
              children: [
                Text(
                  _date.formatDate(),
                  style: TextStyle(
                    fontWeight: FontWeight.bold,
                    fontSize: 24,
                  ),
                ),
                TextButton(
                  onPressed: () async {
                    _date = await showDatePicker(
                          context: context,
                          firstDate: DateTime(1900),
                          lastDate: DateTime.now(),
                        ) ??
                        DateTime.now();
                    setState(() {
                      _convertedDate = DateTime.now().difference(_date);
                    });
                  },
                  child: Text("Pick Your Birthdate"),
                ),
              ],
            ),
            Text.rich(
              textAlign: TextAlign.center,
              TextSpan(
                text: "Your age is \n",
                children: [
                  TextSpan(
                    text: _convertedDate.formatAge(),
                    style: TextStyle(
                      fontWeight: FontWeight.bold,
                      fontSize: 24,
                    ),
                  ),
                ],
              ),
            ),
            Container(),
          ],
        ),
      ),
    );
  }
}

import 'package:flutter/material.dart';

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

  @override
  State<TimePage> createState() => _TimePageState();
}
```

```
class _TimePageState extends State<TimePage> {
  double _timeInHr = 0;
  double _timeInMin = 0;
  double _timeInSec = 0;
  int _index = 0;
  double _enteredValue = 0;

  void _updateTime() {
    setState(() {
      switch (_index) {
        case 0:
          _timeInHr = _enteredValue;
          _timeInMin = _enteredValue * 60;
          _timeInSec = _enteredValue * 3600;
          break;

        case 1:
          _timeInMin = _enteredValue;
          _timeInHr = _enteredValue / 60;
          _timeInSec = _enteredValue * 60;
          break;

        case 2:
          _timeInSec = _enteredValue;
          _timeInMin = _enteredValue / 60;
          _timeInHr = _enteredValue / 3600;
          break;
      }
    });
  }

  @override
  Widget build(BuildContext context) {
    return Scaffold(
      appBar: AppBar(),
      body: Padding(
        padding: const EdgeInsets.all(24),
        child: Column(
          mainAxisSize: MainAxisSize.max,
          mainAxisAlignment: MainAxisAlignment.spaceAround,
          children: [
            Text(
              "Time Converter",
              style: TextStyle(
                fontWeight: FontWeight.bold,
                fontSize: 32,
              ),
            ),
            Row(
              crossAxisAlignment: CrossAxisAlignment.start,
              mainAxisSize: MainAxisSize.min,
              children: [
                Expanded(
                  child: TextField(
                    keyboardType: TextInputType.number,
                    decoration: InputDecoration(
                      labelText: "Enter time in ${[
                        "hour",
                        "minute",
                        "second",
                      ][_index]}",
                    ),
                    onChanged: (String? value) {
                      _enteredValue = double.tryParse(value ?? "0") ?? 0;
                      _updateTime();
                    },
                  ),
                ),
                DropdownButton(
                  underline: Container(),
                  value: _index,
                  items: [
                    DropdownMenuItem(
                      value: 0,
                      child: Text("Hour"),
                    ),
                    DropdownMenuItem(
                      value: 1,
                      child: Text("Minute"),
                    ),
                    DropdownMenuItem(
                      value: 2,
                      child: Text("Second"),
                    ),
                  ],
                  onChanged: (index) {
                    _index = index ?? 0;
                    _updateTime();
                  },
                ),
              ],
            ),
            Text.rich(
              textAlign: TextAlign.start,
              TextSpan(
                    text: "Converted Time is \n",
                    children: [
                      TextSpan(
                        text:
                            "${_timeInHr.toStringAsFixed(2)}
            hrs\n${_timeInMin.toStringAsFixed(2)} mins\n${_timeInSec.toStringAsFixed(2)}
            secs",
                        style: TextStyle(
                          fontWeight: FontWeight.bold,
                          fontSize: 24,
                        ),
                      ),
                    ],
                  ),
                ),
                Container(),
               ],
              ),
             ),
            );
             }
            }
```