



TEAM 1

# TUBES KPL

# Emerging Technologies



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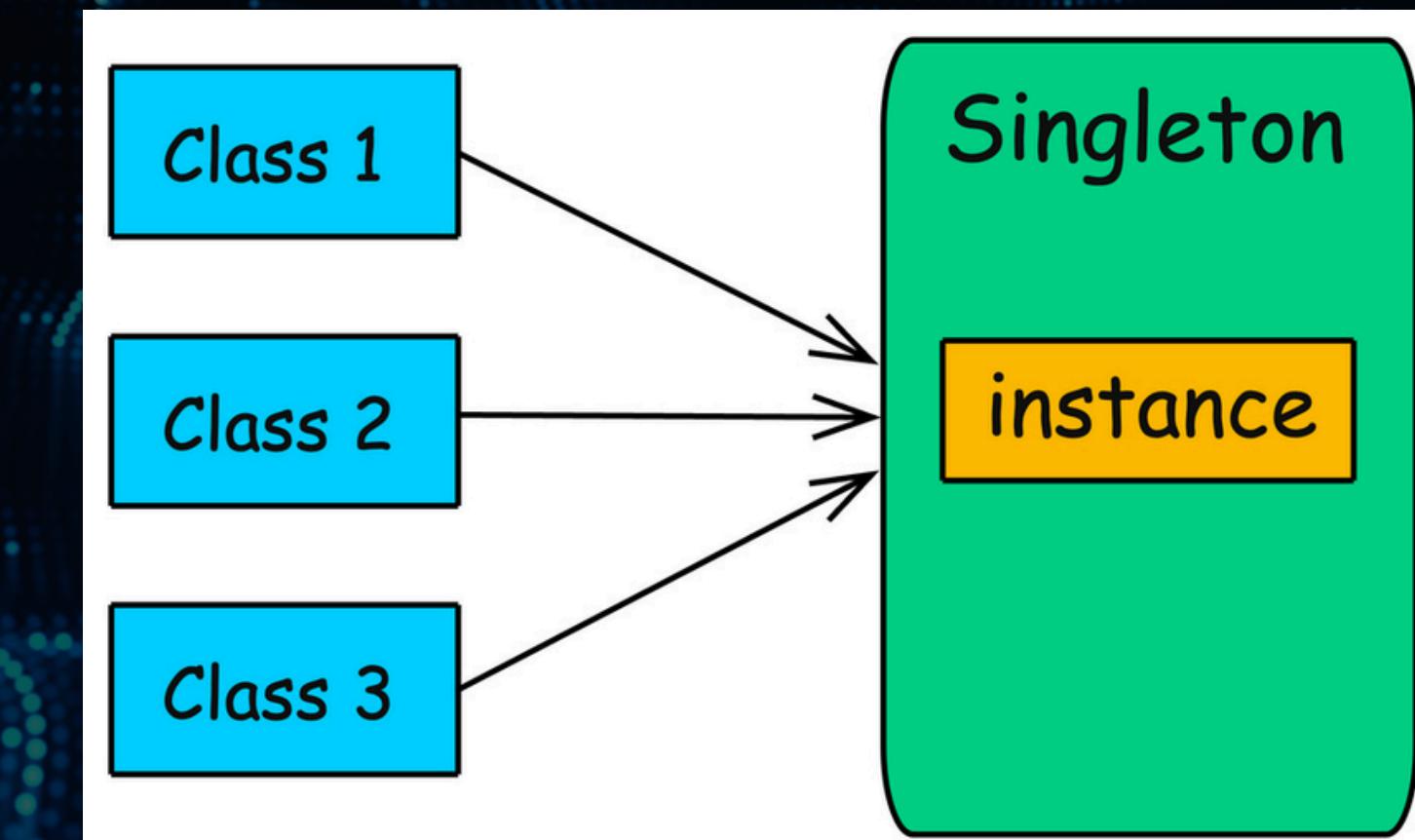
# Project Introduction

Tugas besar ini berfokus pada pengembangan aplikasi konversi mata uang dengan menggunakan Flutter. Money Converter ini memungkinkan pengguna untuk mengonversi nilai mata uang dari satu negara ke mata uang lainnya secara real-time. Konversi dilakukan dengan memanfaatkan API untuk mendapatkan nilai tukar terkini, library untuk pemrosesan data, serta konsep table-driven untuk menyimpan dan mengelola data mata uang secara efisien.



# Design Pattern

Design pattern yang kita gunakan adalah singleton-pattern, karena kami menggunakan API untuk memproses perhitungan kemudian memanggil API atau fetch kami menggunakan dependency http, jadi api ini global karena bisa diakses semua instance.



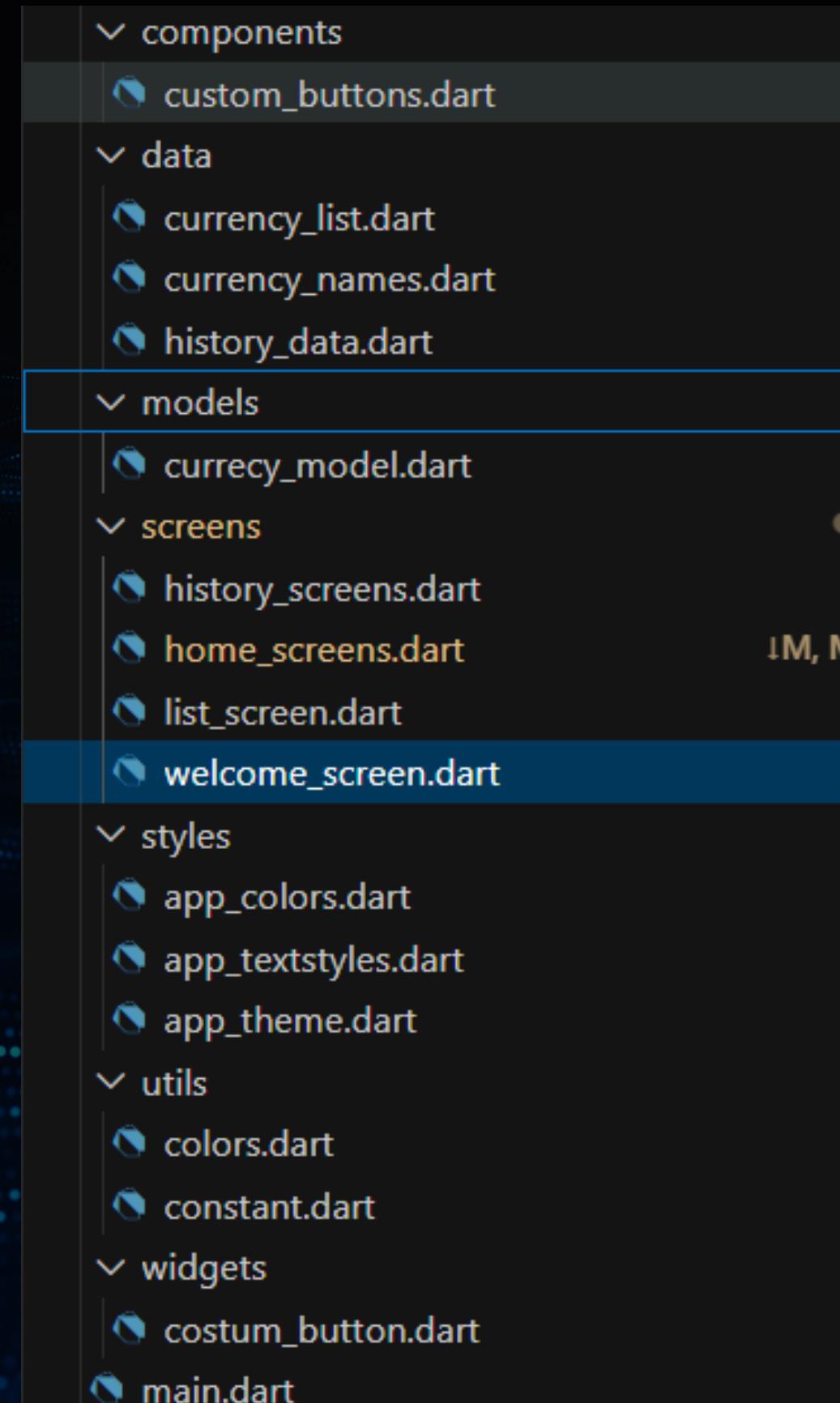
```
● ● ●  
1 // lib/services/currency_api.dart  
2 import 'dart:convert';  
3 import 'package:http/http.dart' as http;  
4 import 'package:flutter_dotenv/flutter_dotenv.dart';  
5  
6 class CurrencyApi {  
7   final http.Client client;  
8  
9   CurrencyApi({http.Client? client}) : client = client ?? http.Client();  
10  
11   final String _apikey = dotenv.env['API_KEY'] ?? '';  
12   final String _baseUrl = dotenv.env['API_BASE_URL'] ?? '';  
13  
14  
15   Future<Map<String, dynamic>> getCurrencyRates() async {  
16     final response = await client.get(  
17       Uri.parse("$_baseUrl?apikey=$_apikey"),  
18     );  
19     if (response.statusCode == 200) {  
20       return json.decode(response.body);  
21     } else {  
22       throw Exception('Failed to load currency');  
23     }  
24   }  
25 }  
26 }
```



# Secure Coding

Setiap user mengganti / memasukan value nya di search bar, maka onchanged akan di excute, lalu jika user memasukan script yg <script> di search bar maka akan ada peringatan XSS attack detected

```
1  onChanged: (value) {  
2      setState(() {  
3          // [MODIFIKASI] Deteksi input XSS  
4          if (value.toLowerCase().contains('<script>')) {  
5              filteredList = ['⚠ XSS attack detected! ⚠'];  
6          } else {  
7              filteredList = currencyList  
8                  .where((item) => item  
9                      .toLowerCase()  
10                         .contains(value.toLowerCase()))  
11                  .toList();  
12          }  
13      });  
14  };
```



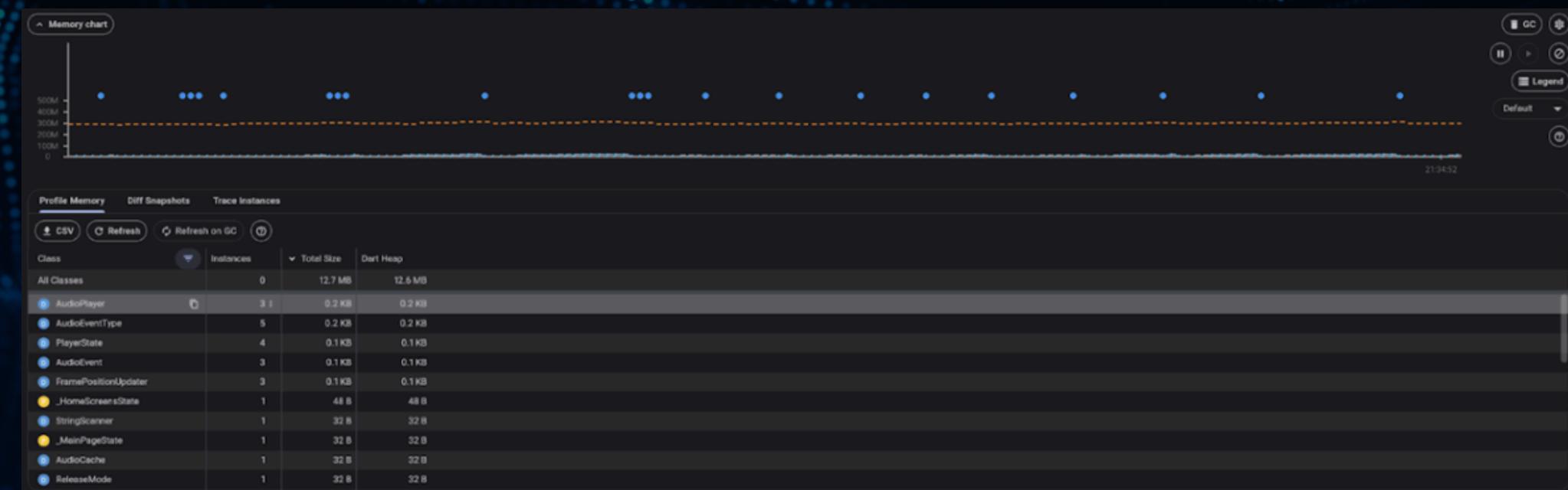
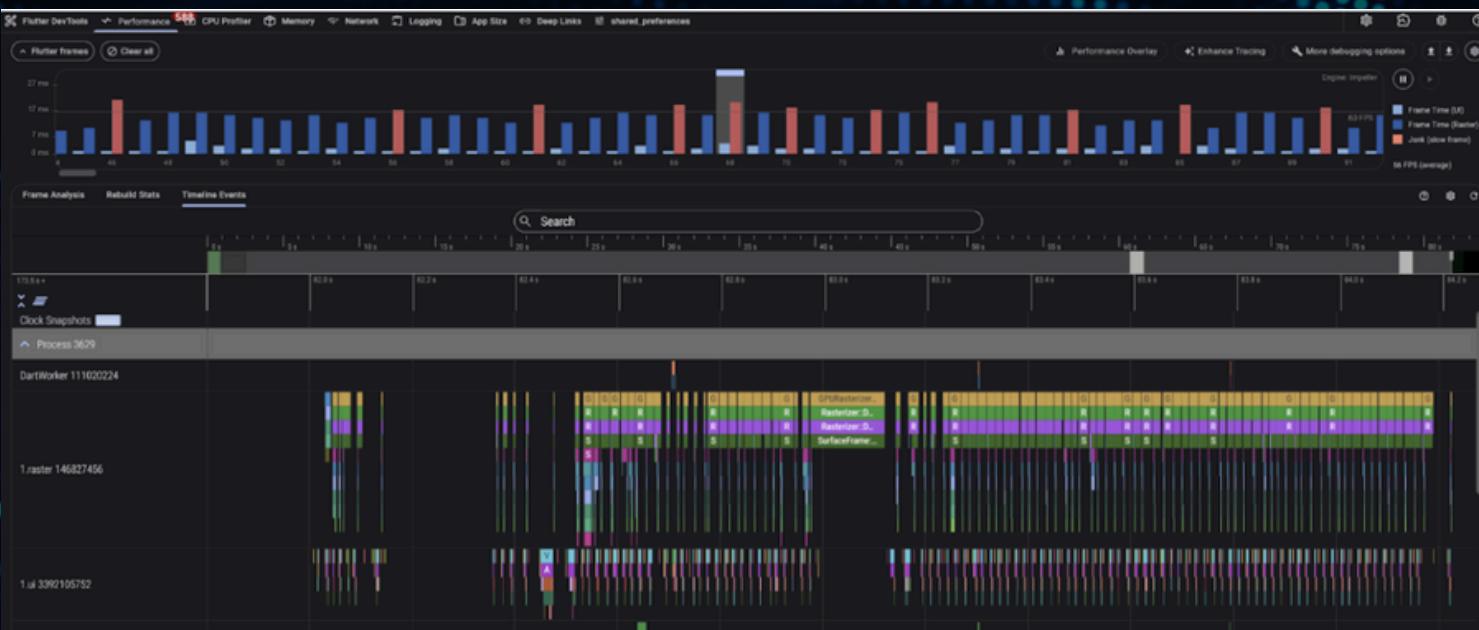
# Clean Code

Karena kami menggunakan framework flutter, maka struktur foldernya juga sudah terstruktur rapih secara default

# Testing

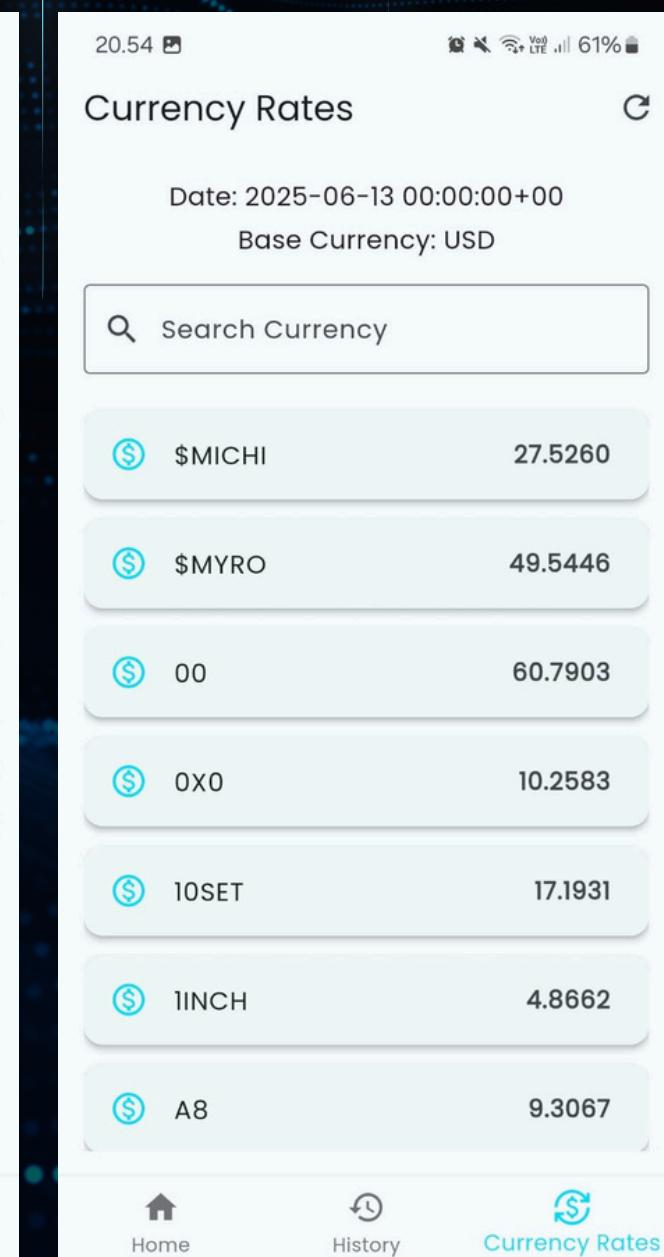
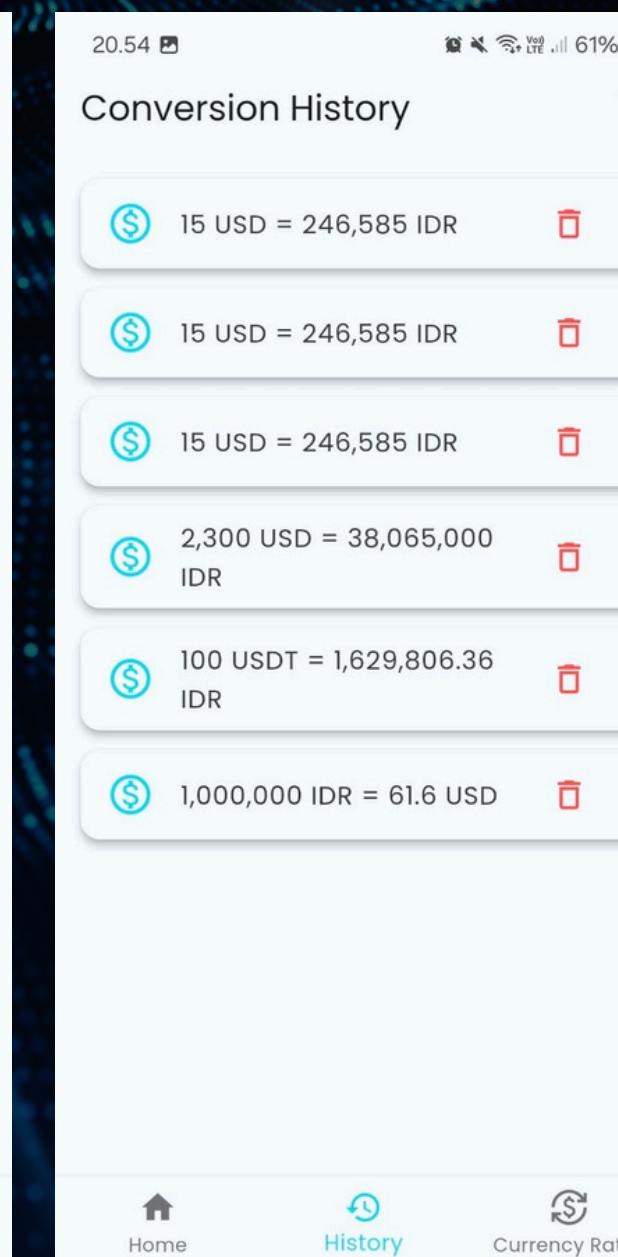
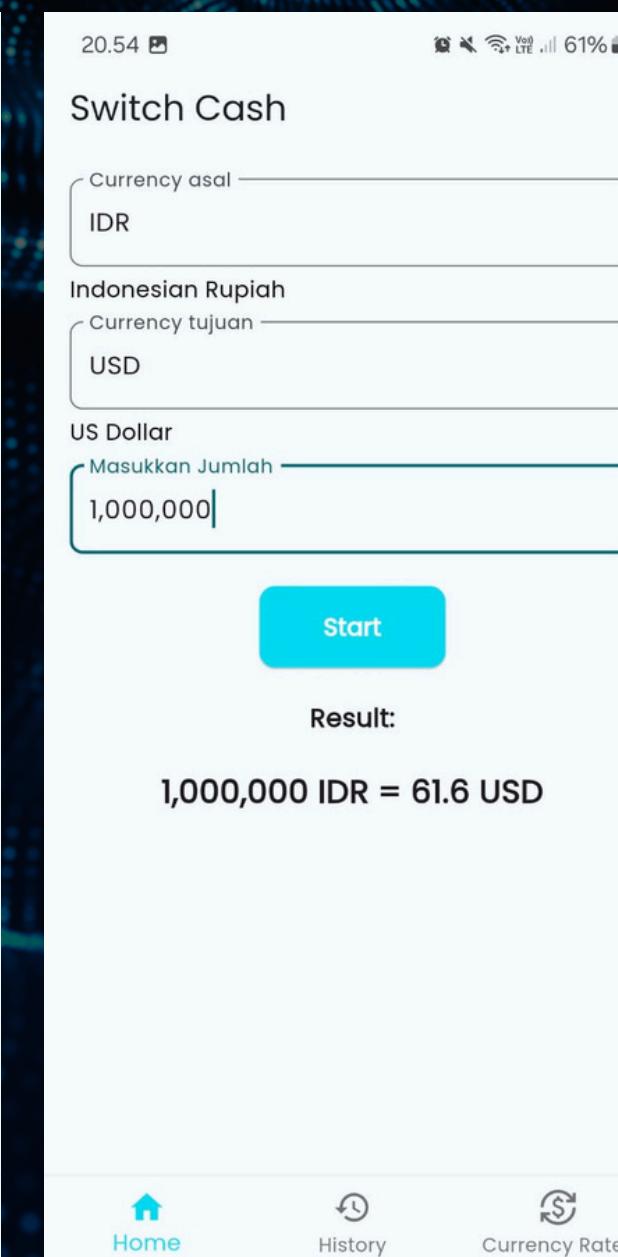
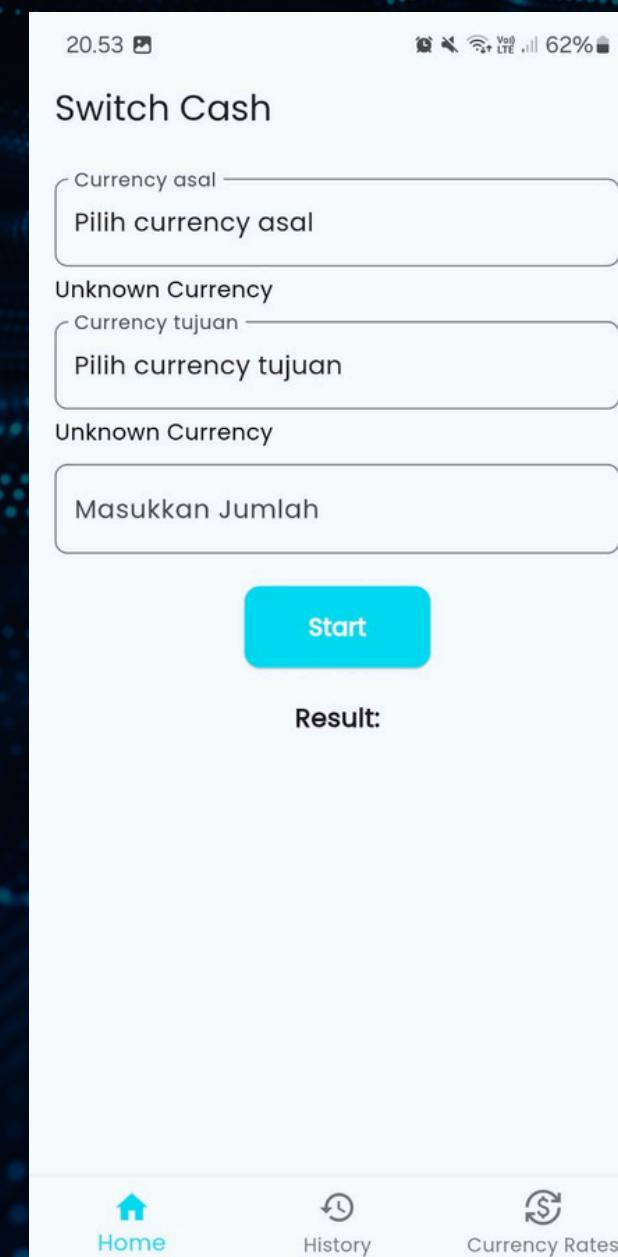
Pengujian Aplikasi Money Converter, dijalankan dengan flutter run melalui framework Flutter Test

- Unit Testing:
  - Pengujian API Mata Uang: currency\_api\_test.dart, mengambil dan menampilkan nilai tukar mata uang dengan mekanisme penanganan error stabil.
  - Pengujian Riwayat Konversi: history\_data\_test.dart, data tersimpan di SharedPreferences; fitur penghapusan riwayat berfungsi baik.
  - Pengujian Pencarian Mata Uang: list\_screen\_test.dart, menguji responsif pencarian daftar mata uang secara real-time.
  - Pengujian Navigasi Aplikasi: main\_page\_test.dart, menguji navigasi melalui BottomNavigationBar.
- Performance Testing:
  - Pengujian Kinerja: Memori penggunaan 12 MB; dilakukan di emulator Android Pixel 8 Pro.



```
✓ switchcash\test\currency_api_test.dart 2/2 passed: 105ms
  ✓ CurrencyApi 2/2 passed: 105ms
    ✓ returns currency rates when the call completes successfully 88ms
    ✓ throws exception when API returns error 17ms
✓ switchcash\test\history_data_test.dart 5/5 passed: 106ms
  ✓ HistoryData 5/5 passed: 106ms
    ✓ saveHistory should add entry to SharedPreferences 49ms
    ✓ getHistory should return empty list if no data saved 7.0ms
    ✓ clearHistory should remove all saved entries 29ms
    ✓ removeHistoryAt should remove entry at specific index 10ms
    ✓ removeHistoryAt with invalid index should do nothing 11ms
✓ switchcash\test\list_screen_test.dart 1/1 passed: 1.4s
  ✓ Search filters the currency list 1.4s
✓ switchcash\test\main_page_test.dart 1/1 passed: 1.6s
  ✓ BottomNavigationBar switches screens 1.6s
```

# Output





Thank You for  
Attention