

Internship on Software Development (Flutter)

BY

Md. Abdul Kader

ID No: 183-15-12049

This Report Presented in Partial Fulfillment of the Requirements
for the Degree of Bachelor of Science in Computer Science and
Engineering

Supervised by

Md. Riazur Rahman

Assistant Professor

Department of Computer Science and Engineering

Faculty of Science & Information Technology

Daffodil International University



DAFFODIL INTERNATIONAL UNIVERSITY

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APPROVAL

This Project/internship titled “ **Internship on Software Development (Flutter)**” submitted by **Md Abdul Kader**, ID No: **183-15-12049** to the Department of Computer Science and Engineering, Daffodil International University has been accepted as satisfactory for the partial fulfillment of the requirements for the degree of B.Sc. in Computer Science and Engineering and approved as to its style and contents. The presentation has been held on 06-01-2022

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Department of Computer Science and Engineering
Faculty of Science & Information Technology
Daffodil International University



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Professor

Department of Computer Science and Engineering
East West University

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Supervised by:



Md. Riazur Rahman

Assistant Professor
Department of Computer Science and Engineering
Daffodil International University

Co-Supervised by:

Mr. Gazi Zahirul Islam

Assistant Professor
Department of Computer Science and Engineering
Daffodil International University

Submitted by:



Md. Abdul Kader

ID: -183-15-12049
Department of CSE
Daffodil International University

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Finally, we need to well-known with due recognize the consistent guide and sufferers of our parents.

ABSTRACT

Flutter: Flutter is a software UI development toolkit. Flutter created By Google Inc. It's an open source framework. Flutter is very popular UI toolkit because it's features. One of the main reason is Platform independent. Flutter can develop any platform applications like Android, IOS, Fuchsia, Windows, Mac, Linux and also web app from a single code.

The first release year of flutter (version 1.0) was 2015. But it wasn't stable version. Google Corporation working on it hardly and released stable version (1.12) on December 2019.

On May 6 2020 google attached dart language with flutter and release dart SDK in V. 2.8 (version of flutter 2.17) where support added Material API, Improving performance on IOS gadgets, new widgets ,and network tracking .

On 03-03,2021 Google announced in an event a major update for flutter that flutter got web applications with new Material kit renderer and web specific widgets, early-access desktop application support for Windows, mac-OS, and Linux and developed Add-to-App API's

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CHAPTER 1

INTRODUCTION

1.1 Flutter Introduction

Flutter is a software UI development toolkit. Mainly flutter used as User interface framework. Its works based on dart language that gives excessive capability via way of means of immediately imparting the person interface at the running device canvas as opposed to the local framework. Flutter design app using widgets, which are actually gather of classes. These widgets are enhanced for cellular environments and designing apps with widgets are as smooth as designing html. Widgets also supports animations and gestures.

1.2 Flutter Features

- i. Integration , flexibility and Scalability capabilities
- ii. Its use dart language which are same as other OOP like java. So its easy to learn
- iii. Platform independent: flutter can develop multiple platform's app using a single code. Its very comfortable for developers because they doesn't have to learn many things.
- iv. High performance output: flutter provide light weight UI using its rendering functions.

1.3 Flutter advantages:

- i. Due to the same code base. We can run app on different types of platforms simultaneously. its very cost effective
- ii. It has hot reload feature. So that when we design a ui using flutter framework we can see real interface as output.
- iii. Being an open source platform , we can make app easily using its material , animation , Cupertino widget from flutters large library
- iv. Flutter framework dependencies based. So it's run on low configuration pc easily.
- v. Flutter support multiple language.

- vi. Flutter has a big dependencies library. (<https://pub.dev>). So we can easily add any widget / function from here.
- vii. It's easy to learn.
- viii. Flutter has big community. So there is 24/7 support for free.

1.4 Flutter disadvantages

- i. Flutter generate big size app. Generally its greater than 4 MB
- ii. Flutter is a google product. So it faces some difficulties to run app on other opponent companies platform like windows, ios . but google Inc. already solve problems and hope in early future there will be no difficulties ,
- iii. Flutter is dart base. In dart there is some difficult term. Because of this sometime increase programming task in app.
- iv. Flutter does not support android TV / Apple TV
- v. Other framework treat UI and logic separately. But in flutter it's combined. So in flutter need to use advanced modules

1.5 Layout of Report

In my report, I mentioned the basic concepts of Flutter that I learned during these 3 months. In "Chapter 1" I have given a brief description of Flutter and Flutter's Features as well as a brief description of Flutter's Advantages and Disadvantages. "Chapter 2" provides of Understanding Flutter Architecture and visualize with diagram. And how to set up an app by installing the Flutter Framework. In "Chapter 3" I have briefly described below how to create a simple app with details. "Chapter 4" briefly describes Flutter's Widgets. Flutter's Dart Programming is described in detail in "Chapter 5". Flutter's Widgets and library classes are described in detail in "Chapter 6". Flutter's FUTURE OPPERTUNITY & CONCLUTION is described in detail in "Chapter 7".

CHAPTER 2

2.1 Understanding the Flutter Architecture

Flutter run app in virtual machine without recompile full code. Because flutter support hot reload. Flutter apps compiled directly to machine code, whether Intel x64 or ARM instructions or to java-script if targeting the web. Flutter maintain a procedural architecture. Its design as an layered, extensible system. It exist independent libraries that each depend on the underlying layer. Every part of the framework is designed to be optional and replaceable. One of the function of flutter is no layer has privileged access to the layer below. In flutter architecture, there is three layers.

- i. Framework
- ii. Engine
- iii. Embedded

Framework: framework includes Cupertino widget, material design widget, text button widget, animation widget, gesture widget, and color – painting widget foundation etc. the core code lies in flutter package which is in flutter repository / library. In flutter repository there is lots of library for different function. Such as dart: ui repository provides interfaces between the flutter framework and the engine, dart: math repository provides mathematical functions.

Engine: Engine mainly includes dart, text, skia graphics engine. Skia serves graphics engine for web browsers and different kind of OS. Dart includes Dart runtime, GC (Garbage collection). Text refers to text rendering which acts on libtxt library.

Embedded: it's an embedding layer that embeds Flutter into various platforms. Mainly its task is rendering surface settings, plug ins and thread settings. Flutter has excellent cross terminal consistency.

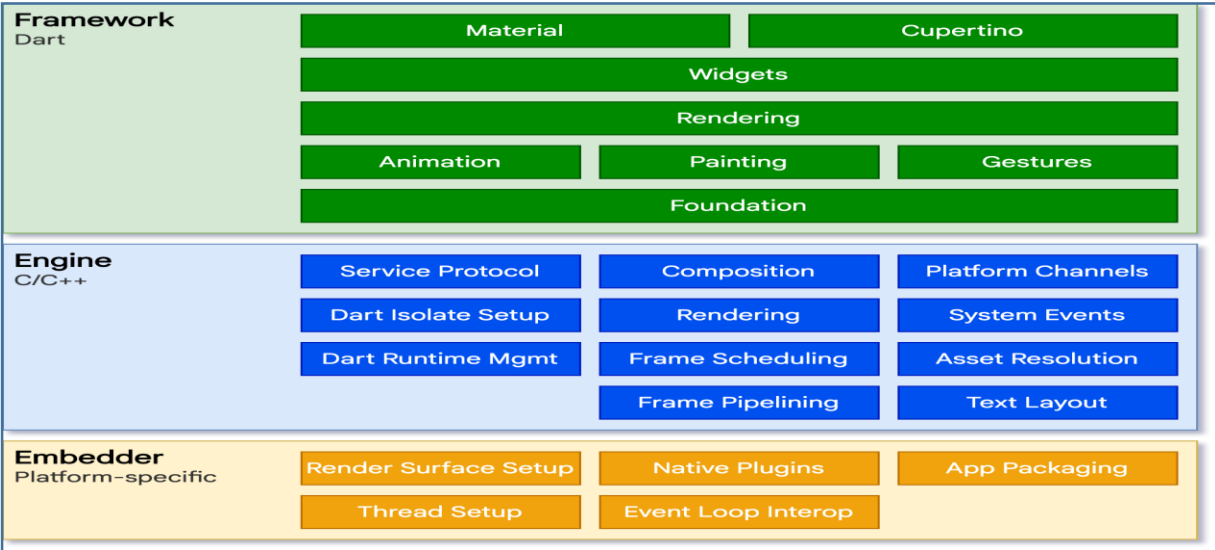


Figure: 2.1.1 Flutter Architecture

2.2. Flutter Installation and setup

We can install and use flutter in all computer operating system. We learn and work on windows OS, because of its popularity in our country. So I will show the process for windows operating system.

Step 1: At first we need to download flutter SDK. For download – we need to go to official site of flutter and download latest version. URL (‘https://docs.flutter.dev/get-started/install/windows’).

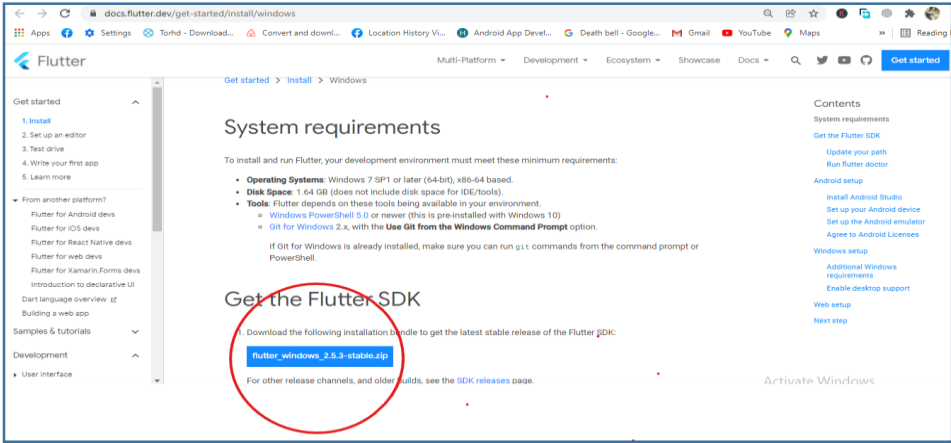


Figure: 2.2.2 Flutter Download

Step 2: extract downloaded zip file in any directory. Flutter recommended ('C:\Users\\Documents')

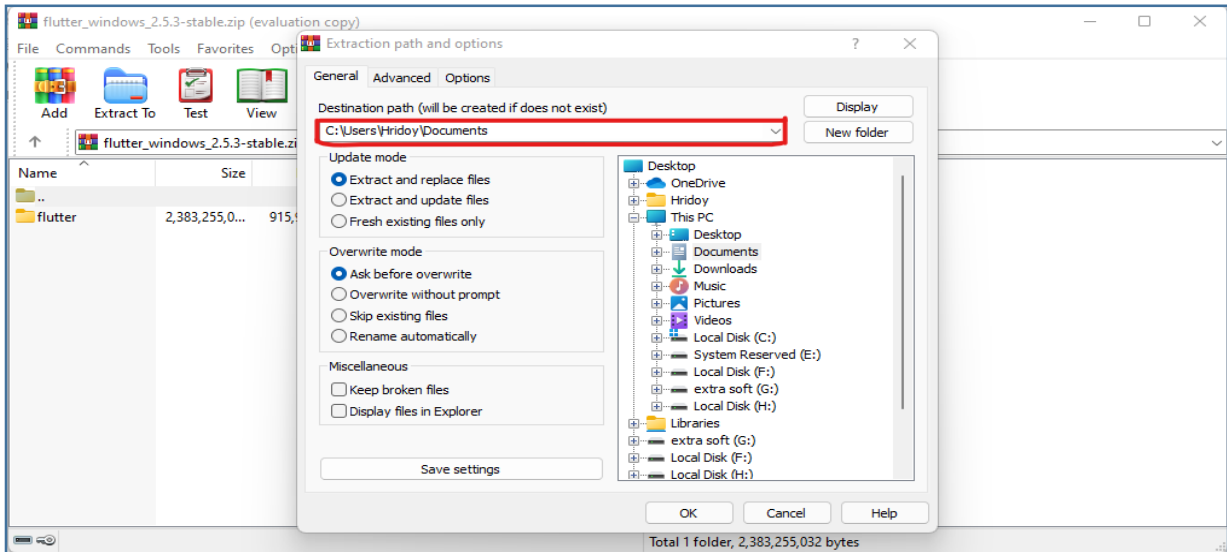


Figure: 2.2.3 Extract Flutter sdk

Step 3: Update system path

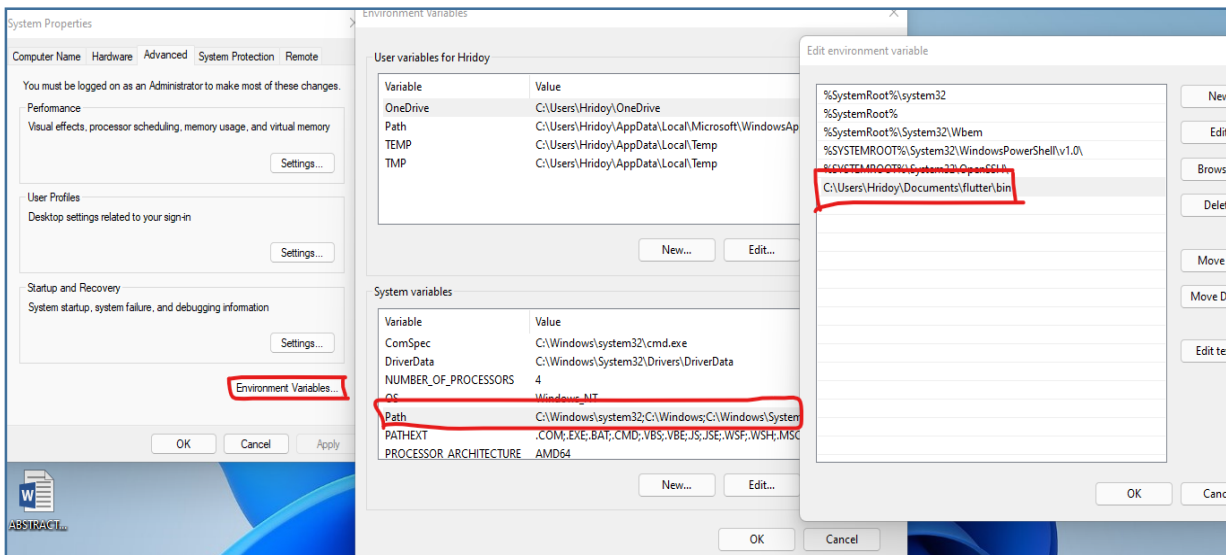


Figure : 2.2.4 Path create in windows environment

Step 4: Flutter will provide a instruction set name “flutter - doctor” to check the status of flutter.

To check this, go to cmd and type flutter doctor. If result same as like below picture. It confirmed that flutter install successfully.

```
$ flutter doctor
Doctor summary (to see all details, run flutter doctor -v):
[✓] Flutter (Channel stable, v1.7.8+hotfix.4, on Mac OS X 10.14.5 18F203, locale en-PT)
[✓] Android toolchain - develop for Android devices (Android SDK version 29.0.0)
[✓] Xcode - develop for iOS and macOS (Xcode 10.2.1)
[✓] iOS tools - develop for iOS devices
[✓] Android Studio (version 3.4)
[✓] VS Code (version 1.36.1)
[!] Connected device
    ! No devices available

! Doctor found issues in 1 category.
```

Figure: 2.2.5 Check Flutter Availability

Step 5: Now we need a code editor (also compiler and app generator). We can use android studio, VS code. I use vs code so I will show the vs code process.

- i. Download vs code from official site. <https://code.visualstudio.com/download>
- ii. Extract the zip file and double click on vs code icon. Vs code is ready to use.
- iii. Then just set flutter and dart plugin in vs code. Open vs. code. Then click on extensions and search for flutter and dart. It will show result, then install flutter and dart from the list.
- iv. Restart vs code.

CHAPTER 3

Creating Simple Application in Android Studio

3.1 Creating Application Project in VS code

Let's create a project in vs code using flutter SDK.

Step 1: open VS Code application

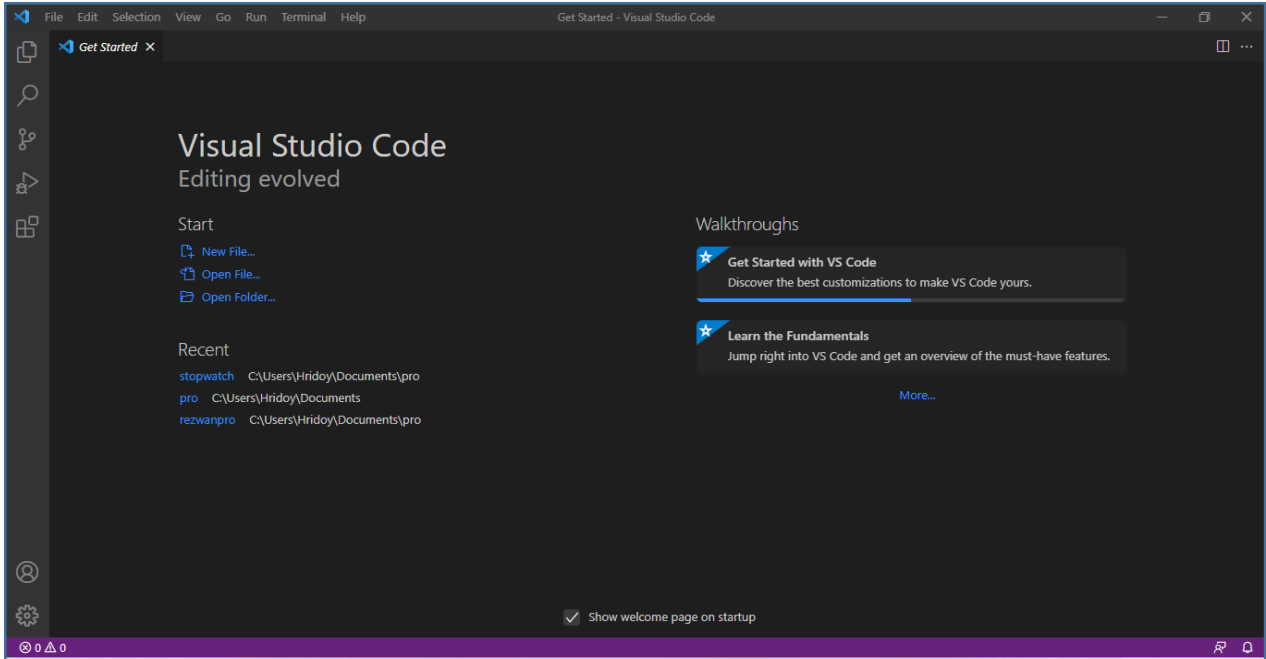


Figure: 3.1.1 VS Code Open

Step 2: open a folder

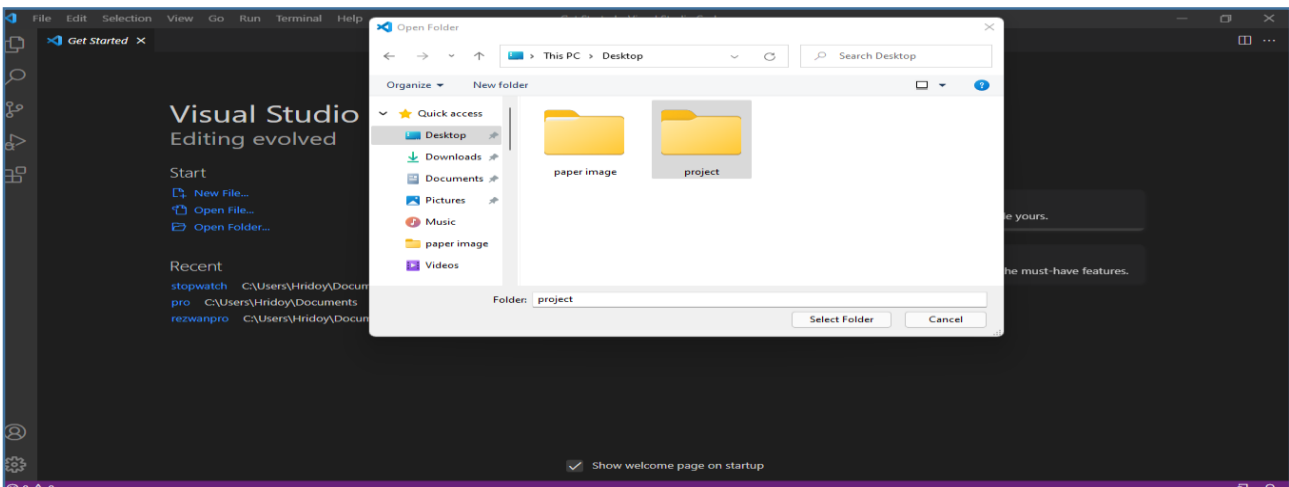


Figure: 3.1.2 Open Folder in VS Code

Step 3: Go to terminal and type flutter create appname (place a project name instead of appname). And hit enter

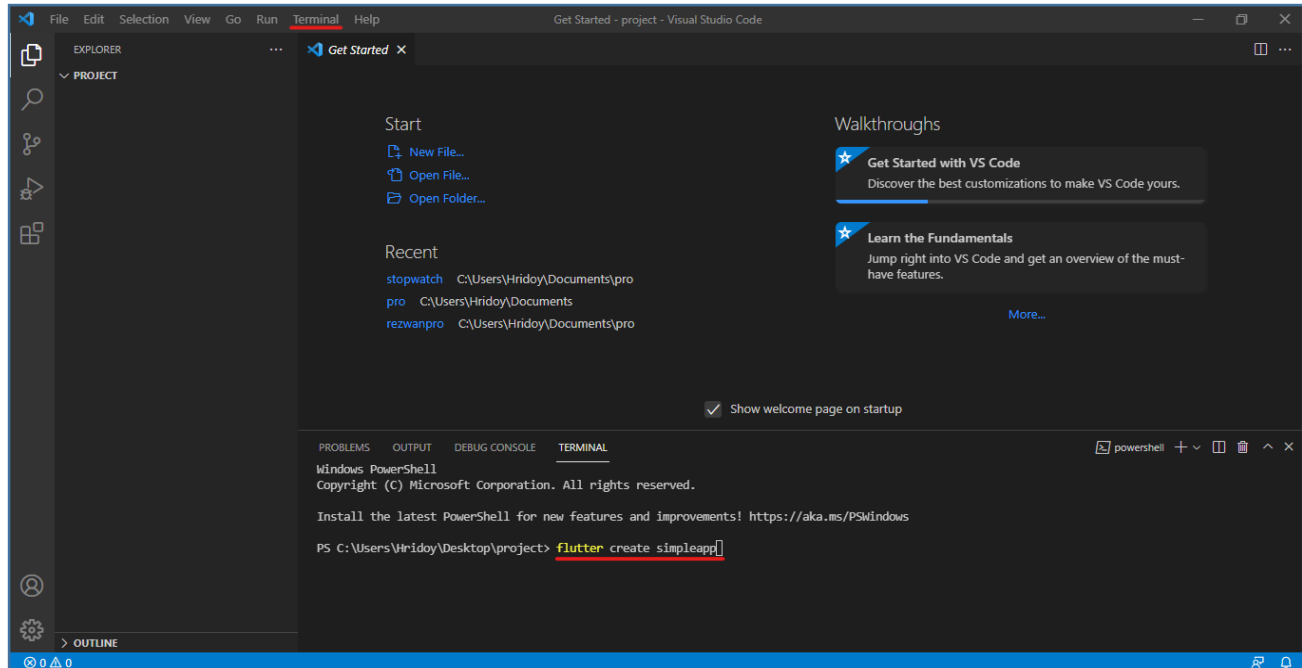


Figure: 3.1.3 create flutter Project

Step 4: we will see that left side of vs code screen, a project is added with some default folders and function. From there we need to go lib folder and open main. Art file to run or write code. After create project , flutter provide a default app. Here we will just run default app and see the result on emulator / web browser.

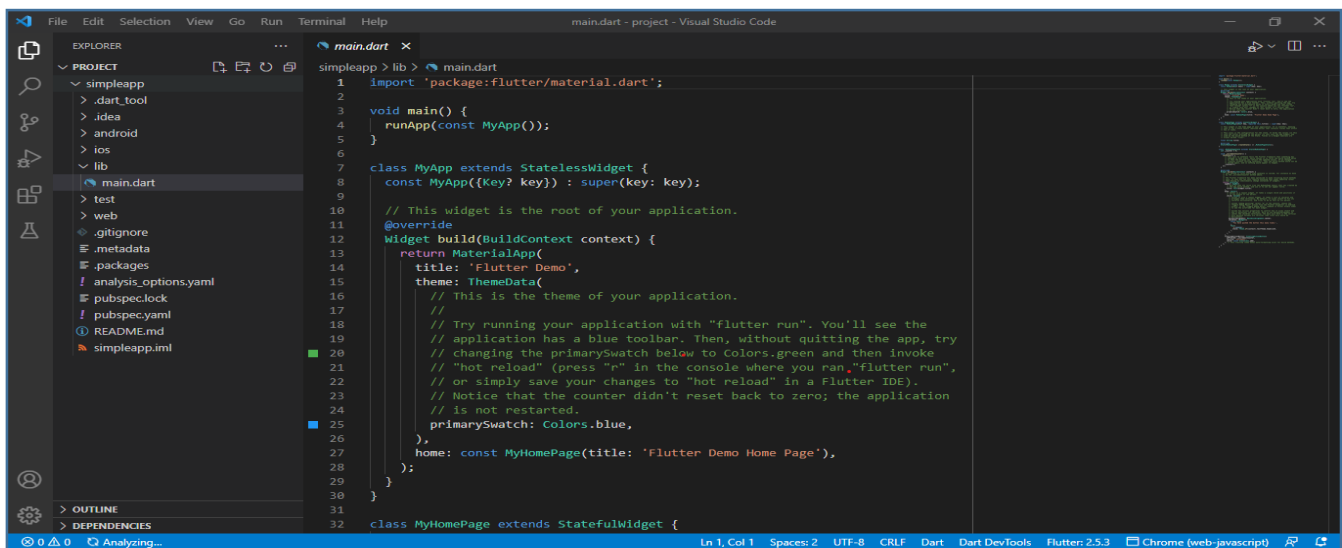


Figure: 3.1.4 default app code

Step 5: finally the output of default app:

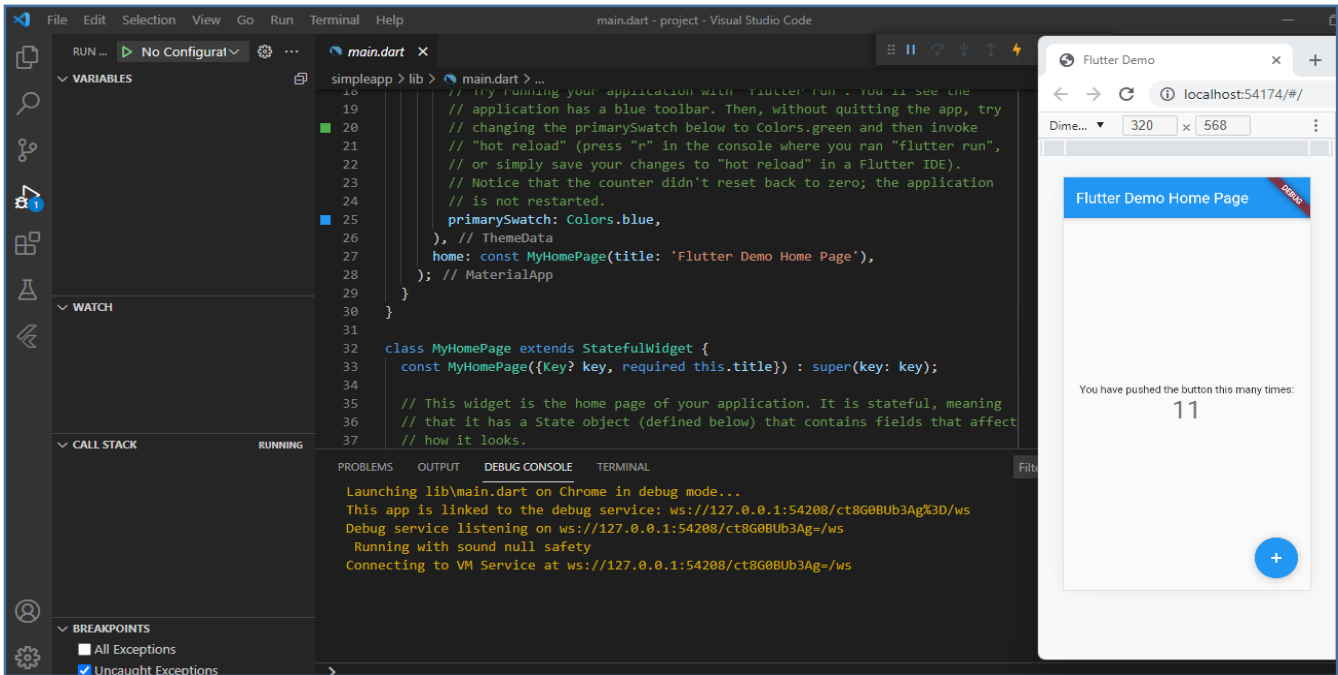


Figure: 3.1.5 default flutter app output

CHAPTER 4

FLUTTER WIDGETS

4.1 widgets:

In this section I will describe about widgets in flutter. Actually in Flutter everything is widget. In flutter an app is gather of some widgets. Widgets describe the view of an app. Such as we show text. Text is a widget. If we color that text we need Color widget inside another widget named text style. So we can say that flutter structure is stack of widgets. This stack is known as widget tree.

This widget tree has two parts.

- i. Pre-defined widgets (MaterialApp, Appclass, scaffold, safearea)
- ii. User defined widgets. (appbar, center, column, text, container, stack)

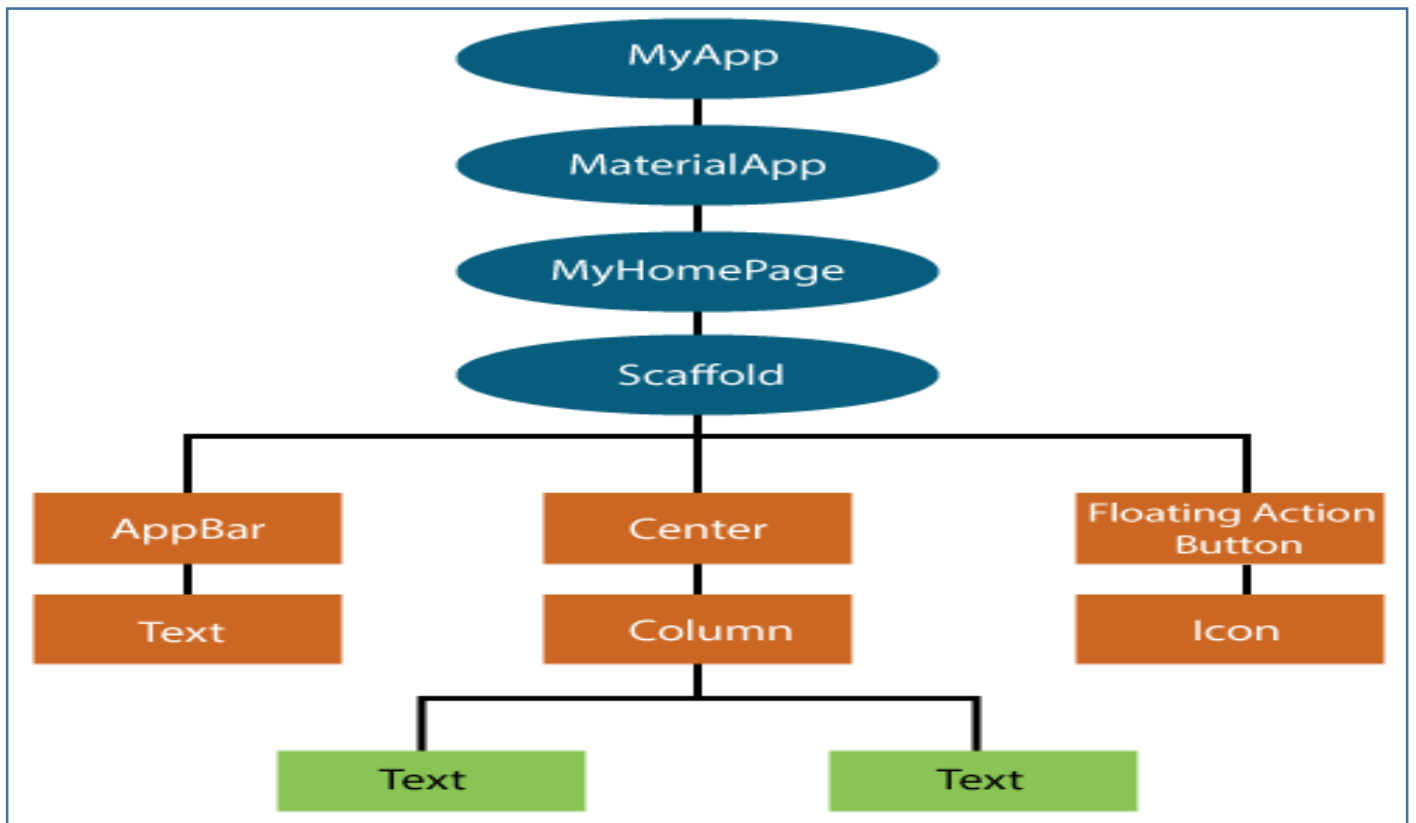


Figure: 4.1.1 Flutter Widget Tree

```

Widget build(BuildContext context) {
  return MaterialApp(
    title: 'Flutter Demo',
    theme: ThemeData(
      primarySwatch: Colors.blue,
    ), // ThemeData
    home: Scaffold(
      body: SafeArea(
        child: Container(
          child: Text('Hello world'),
        )), // Container // SafeArea
    ), // Scaffold
  ); // MaterialApp
}

```

Figure: 4.1.2 structure of Widgets in code

Pre-defined widgets: these widgets are necessary. Without these flutter can't create app. That's why we can see that in tree these widgets are in top layer

And under these layers we can define any widget what I want to show. Like text, image, button, icon etc. these widgets are known as user define widgets. These kind of widgets are not essential for run app.

4.2 Flutter Gestures:

In app , we need to do different operation like tap , drag, click ,select . to do this flutter use gestures. Gestures actually convert a widget into tapable. Gestures which one describe semantic actions. Its functions are: onTap, OnDoubleTap, onTapDown etc

CHAPTER 5

Introduction to Dart Programming

5.1 Introduction:

Dart is an open source high level language. Dart support OOP concept. Its develop by google. Dart language specially for flutter framework and dart has own Virtual Machine name dartvm. Its syntax are similar with javascript and java.

5.2 Variables and Data types

In flutter, data type are same as like other language with another type called dynamic data type. Its name is 'var' type. We can store any kind of data using this type of data type

```
var name = Hridoy;  
var id = 45;  
var cgpa=3.45
```

Constants are declared using the final and const keywords. Here are some of them:

```
final a = 100;  
const pi = 3.1416;
```

The DART language supports these data types:

- Number – It act for alphanumeric integers ,double precision numbers.
- Boolean-Boolean values are used to indicate false and true.
- Lists and Maps: Used to present collections of objects.

List defined as follows:

```
var number = [78,54,9,5,6];  
print(number);
```

The list shown above generates the list [78,54,9,5,6].

The map defined as shown below-

Map has two parts

- i. Key
- ii. Value

```
var map = {'id': 1,'name':'hridoy'};  
print(map);
```

Here in the example 'id' is key and 1 is value, 'name' is key and hridoy is value

Output: {id: 1, name: hridoy}

Dynamic: If the variable kind isn't always defined, its default kind might be dynamic . The instance explains the dynamic kind variable

```
dynamic name = "hridoy";  
print(name);
```

5.3 Decision Making and Loops

A circumstance have to be evaluated earlier than a decision-making block may be implemented. Dart helps If, If. else and wishes to extrude the statement. Loops are used to copy a block of code till a positive circumstance is met. Dart helps, for in, at the same time as and do. At the same time as loops. Below is a easy instance approximately using manage statements and loops–

```
main() {
  for ( int j = 1 ; j <= 15; j++ ) {
    if(j%2==0) {
      print(j);
    }
  }
}
```

Output: 2,4,6,8,10,12,14

5.4 Functions

A characteristic is a set of statements that carry out a particular project together. Let's study a easy method in Dart as proven below–

```
main() {
  min (10.0, 5.0);
}
void min ( double number1,double number2) {
  double result;
  result =number1+number2;
  print(result);
}
```

When we call add function in main function it will show result in output is summation of 10.0 , 5.0 = 15.0.

Because when we pass 10 and 5 as parameter of add function . functions consider as the value of number1 and number2.

5.5 Object Oriented Programming

Dart is an item primarily based totally language. It helps item-orientated programming capabilities along with classes, interfaces, etc.

A blueprint for growing a category item. A magnificence definition is covered below –

- Fields
- Getters and setters
- Constructors
- Functions

CHAPTER 6

Flutter Introduction to Widgets

6.1 Platform specific widgets

Flutter has specific widgets for one platform - IOS or Android. Android Widgets designed consistent with the material format recommendations through manner of approach of Android Operating System. Material widgets are called widgets which are use for Android Operating System. IOS widgets are made consistent with Apple's Human Interface recommendations and known as Cupertino.

Below are a number of the maximum used factors widgets-

- Scaffold, AppBar, BottomNavigationBar, TabBar, TabBarView, ListTile,

Here are some common Cupertino widgets which are used most-

- CupertinoButton, CupertinoPicker, CupertinoDatePicker, CupertinoTimerPicker, CupertinoNavigationBar, CupertinoTabBar, CupertinoTabScaffold, CupertinoDialogAction, CupertinoTransition, , Dialogition

6.2 Layout widgets

In Flutter, a widget is made by combining 1 or more widgets. In order to combine lots of widgets into one widget, Flutter provides a big amount of widgets with layout functions. Such as, the child widgets are concentrated by the central widget. Here are some popular design widgets-

- **Container**-Box Decoration widget with background, border and shadow to create a rectangular box
- **Center** – Brings its child widget to the center

6.3 State management widgets

In Flutter, every widgets can be obtained from stateless widgets or state full widgets. The Stateless widget has no state information, but it can contain State full Widget widgets. For example, clicking the button will decrease/ increase the position within the counterapp, and the responsive behavior of the floating widgets must be render automatically the widget with new state data.

6.4 Platform independent widgets

Text

The text is used to display a string of characters. Text is a class which is defined as widget in mother class. You can use style attributes and text style classes to set the style of the string. The structure of that widget is provided below:

```
Text('Abdul Kader hridoy!', style: TextStyle(fontWeight: FontWeight.bold))
```

The text widget has a special constructor `Text.rich`, which uses children of the `TextSpan` type to specify strings with different styles. The `TextSpan` widget is repetitive in nature and treats the text space as a child.

The important attributes of the text widget are as follows:

- **maxLines, int, overflow, TextOverFlow, style, TextStyle, textAlign, TextAlign**
- **textDirection, TextDirection**

Image

- **Image, Image.Asset, Image.File, Image.memory, Image.Network, AssetImage**

The simplest manner to load and show an photograph in a flutter is to encompass the photograph as an utility useful resource and show it withinside the widget on demand.

- Create a folder, useful resource and assignment the vital photographs withinside the assignment folder.
- The assets are indexed in pubspec.yaml as proven withinside the discern below

```
flutter:  
  assets:
```

- Now, let's load and show the photograph inside the application.

```
Image(image:AssetImage('assets/hridoy.jpg'));
```

```
Widget build(BuildContext context) {  
  return MaterialApp(  
    debugShowCheckedModeBanner: false,  
    title: 'Flutter Demo',  
    theme: ThemeData(  
      primarySwatch: Colors.blue,  
    ), // ThemeData  
    home: Scaffold(  
      appBar: AppBar(  
        title: Text('simple image app'),  
      ), // AppBar  
      body: SafeArea(  
        child: Container(  
          child: Center(  
            child: Image(image: AssetImage('assets/hridoy.jpg'))), // Center // Container  
          ), // SafeArea // Scaffold  
        ); // MaterialApp  
      }  
    }  
  }  
}
```

Figure : 6.4.1 Image Set code

The loaded image is given below

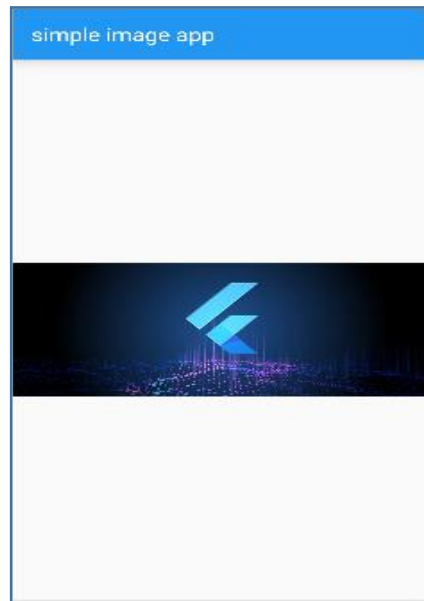


Figure : 6.4.2 Output of image

The maximum essential characteristic of the photograph widget is given below –

**image, Image Provider, width, double, height, double, alignment, Alignment
Geometry**

Icon

Icon widgets are used to display glyphs from fonts described in the IconData class. Below is a code to load a easy e mail icon–

```
Icon(Icons.call)

Widget build(BuildContext context) {
  return MaterialApp(
    debugShowCheckedModeBanner: false,
    title: 'Flutter Demo',
    theme: ThemeData(
      primarySwatch: Colors.blue,
    ), // ThemeData
    home: Scaffold(
      appBar: AppBar(
        title: Text('simple icon app'),
      ), // AppBar
      body: SafeArea(
        child: Container(child: Center(child: Icon(Icons.call))),
      ), // SafeArea // Scaffold
    ); // MaterialApp
  }
}
```

Figure : 6.4.3 Icon setup Code

The loading icon is given below–

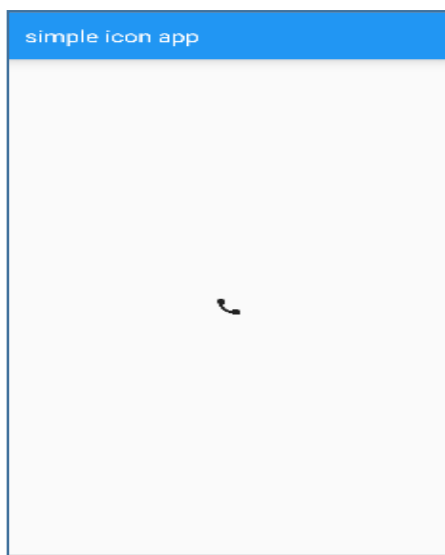


Figure: 6.4.4 Output of Icon

CHAPTER 7

FUTURE OPPERTUNITY & CONCLUTION

7.1 Conclusion of Internship

The Bangladesh authorities introduced in 2011 that our u . s . can be absolutely virtual via way of means of 2021. To this end, the Government of Bangladesh has taken many essential steps for the boom of the Information Technology (IT) industry. The call of this idea is "Digital Bangladesh". Book expertise is critical for laptop technology college students however realistic expertise makes us extra confident. I thank Cronyco Networks and IT for giving me the possibility to paintings with them and I even have carried out so much. Have enjoy in "software program". Now I am imposing the expertise I were given from the internship. There are plans to get a activity in a huge software program organization with inside the future.

7.2 Future Opportunity for Career

The Floater Framework does a super activity of presenting an amazing framework for constructing cell programs in a absolutely platform-impartial way. Provides simplification of improvement process, ensuing in excessive overall performance in cell programs, Android And with a wealthy and applicable consumer interface for each iOS platforms, The Flutter Framework will in reality permit many new builders to get towards excessive-overall performance and feature-wealthy cell programs with inside the future.

APPENDIX A

Introduction

Internships include learning the actual activity of words and applying theories of understanding, application and research. It is a workplace for university students and to understand the actual work environment before entering the labor market. This is a real opportunity for students to adapt to their future professional lives Learning in a full inter I learned the following topics while practicing at CronyCo Networks and IT.

Discipline

Throughout my internship, I have learned discipline which is very important. I have learned to be disciplined in the business environment. I learned from my work how to follow working hours and office and maintenance. It is very important that I also face discipline.

Understanding Responsibilities

All kinds of work have responsibilities and must be fulfilled. Face the given situation and manage it using skills. The senior members of the team explained and supported it to me

I have to satisfy the responsibility of working in the situation. I learned a lot from my seniors.

To be Professional

To get a good service, perfection must be in the workplace. And without a professional and appropriate attitude it is impossible to have perfection in the workplace.

APPENDIX B

COMPANY INFORMATION:

CSLIT established in Dhaka. CSLIT is a growing and renowned IT firm . They are providing various IT training, website design, website development customize software, domain and hosting service. They provide professional courses on IT and Software and provide IT support to different kind of organization. In Dhaka they are have reputation in this field

COMPANY ADDRESS

CSLiT

Address: House# 08, Road# 1/B, Sector# 09, Uttara, Dhaka-1230

Email: info@cslitbd.com

Phone: 01313661490

REFERENCE

- [1] https://www.tutorialspoint.com/dart_tutorial_for_beginners/index.asp
- [2] <url://www.flutter.dev>
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