Fullstack Mobile Application Development with Flutter and Firebase

TechOrigin Technology Development Course Handout

Date: July 2024

Overview & Purpose

Flutter is a software development kit and an astounding cross-platform app development tool, introduced by Google. It uses the Dart language for programming. Flutter was launched in 2018 with the features that were missing in the previous cross-platform development tools.

Google Firebase is a comprehensive platform that offers a range of tools and services for developing and managing mobile and web applications, including features like real-time database, authentication, hosting, analytics and others.

In this course, our focus will be on mobile application development utilizing Flutter and Firebase. Flutter will be employed as the frontend development tool for creating visually appealing program designs, while Firebase will serve as the backend development framework, assisting in managing databases, authentication, and other backend infrastructure.

Course Duration

The mobile application development technology school will span 3 months, consisting of between 35-40 class sessions lasting three hours each, and the schedule will be communicated through the designated platform.

Technical Project/Internship

Throughout the course, all students of the Technology School will receive dedicated attention and mentorship, particularly during the Technical Project phase, which will extend for a period of 2 to 3 weeks. Following the completion of the project, the Education Board of TechOrigin will evaluate and consider the possibility of providing internship opportunities to deserving student(s).

Certification

The issuance of a Course Completion Certificate will be exclusively granted to students who complete their Technical Project and weekly Assignments and attend classes regularly

Course Outline

1. Introduction to Course **[Class One - Two]**
    a. Overview of Software Development
        i. History
        ii. Frontend Architecture
        iii. Backend Architecture
        iv. Fullstack Development
    b. Overview of Mobile Application Development

    i. Mobile Development tools
    ii. Cross-Platform Development Apps
    iii. Why Flutter + Firebase
    iv. Mobile Application Development Platform
    v. Complete Installation of Tools
  c. Algorithmic Thinking & Programming
2. Programming with Dart **[Class Three - Seven]**
  a. main() function
  b. Dart Variables & Data Types
  c. Writing Comments
  d. Dart Operators
    i. Numerical Operator
    ii. Conditional Operator
    iii. String Operator
  e. String Manipulation
  f. List Manipulation
  g. Dictionary and JSON Data Manipulation
  h. Conditional Statements
    i. If Statement
    ii. Break Statement
    iii. Switch statement
  i. Loops & Iterations
    i. For Loops
    ii. While Loops
    iii. Do-While Loops
3. Object Oriented Programming (OOP) **[Class Eight - Ten]**
  a. Creating and Managing Functions
  b. Creating and Managing Classes
  c. Adding Methods to Classes

   d. Class Constructor
   e. OOP Forms
      i. Inheritance
      ii. Polymorphism
      iii. Encapsulation
      iv. Abstraction
      v. Static Classes
   f. SOLID Principles and MVVM architecture
4. Introduction to Flutter **[Class Eleven - Eighteen]**
   a. Flutter Installation
   b. Running Flutter App
   c. Stateful & Stateless Widgets
   d. Flutter Widgets Part One
      i. Material App
      ii. Scaffold
      iii. Container
      iv. Column
      v. Row
      vi. Stack
      vii. Card
      viii. Image
      ix. Other Layouts
   e. Flutter Widgets Part Two
      i. ListTile
      ii. Icon
      iii. Text
      iv. TextField
      v. Button
      vi. Navigation & Routing

vii. Drawer
viii. ListView
ix. DefaultTabController, TabBar, and TabBarView Widgets
x. Table

f. Flutter Widgets Part Three
i. CheckboxGroup and RadioButtonGroup
ii. Date Picker
iii. Time Picker
iv. Slider Widget
v. Switch Widget
vi. Alert Dialog Widget
vii. Bottom Sheet
1. Modal Bottom Sheet
2. Persistent Bottom Sheet

5. Introduction To Firebase **[Class Nineteen - Twenty-Five]**
a. Authentication
b. Firestore collections and rules
c. Crashlytics
d. Storage
6. Flutter + Firebase **[Class Twenty-Five - Thirty]**
a. Integrating Firebase logics
b. Linking up
7. Wrapping it up - Simple Project **[Class Thirty-One- Thirty-Three]**
8. App Publishing **[Class Thirty-Four]**