



## **OOP LAB PROJECT**

# **C++ Learning and Assessment System**

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## **Introduction**

C++ Learning and Assessment System as its name suggests is an application that teaches students every concept of Object-Oriented Programming-specifically C++. The course is taught on three distinct levels, divided according to their level of difficulty. The journey begins with the Beginner level followed by Intermediate and eventually ends on Advanced level. The course ensures (after taking assessments in the form of quizzes) that the concepts are properly grasped by the user. To monetize the application, it takes the bank account details and provides Premium Service which allows complete access to all the three aforementioned levels. A distinguishing feature of the application is that it also provides limited access to the Beginner level, if Free service is opted. Another user of the application is the Teacher who can get the details and progress of the students.

## **Scope of Project**

Whenever a new user opens the application, he needs to sign-in. Once the user provides details, he must log-in to continue. After logging-in the application asks for a subscription service. Then, the application takes a diagnostic test to assess the knowledge of the student. If the user takes a premium service, he needs to provide his bank details before the diagnostic test. The level of the user is determined based on his diagnostic test score. He is first taught the concept of the level and afterwards the quiz is taken that decides his promotion to the next level. A user can continue from wherever he lefts after logging out. The percentage obtained at each level is stored in the file and is only visible to the teacher.

## Files



### **Signup.txt**

Stores the first name, last name, email, password and date of Birth of the user.



### **SubcribMethod.txt**

Stores the email address and Service method of the user.



### **Diagnostic.txt**

Contains the quiz for the Diagnostic Test.



### **BankDetails.txt**

Stores the email, Card number, CVC number, Postal code, address of the premium user.



### **Level1-15.txt**

Contains the content taught for each level.



### **LevelTest1-15.txt**

Contains the quiz for each level.



### **LevelAnswer1-15.txt**

Contains the answers to each quiz.



### **Levels.txt**

Stores the email, current level, Subscription method of the user.



### **Percentage.txt**

Stores the percentage obtained at each level by user along with their email.



### **Admin.txt**

Stores the email, password and type of the teachers.

# Class Diagram

<https://ibb.co/nmspVkJ5>

Signup
- FirstName : string
- LastName : string
- Email : string
- Password : string
- date : Date
<<constructor>>
+Signup()
+setPassword() : void

**Signup** class takes the users credentials. The class contains checks that ensure the validity of date and password. This also checks that an already registered is not registered again. All the data obtained is stored in a file named **Sinup.txt** which the **login** class uses.

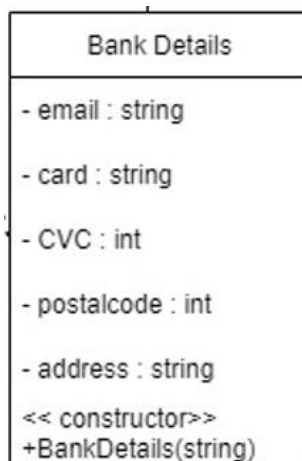
The class **Date** ensures that the data such as the Expiry date and Birth dates are not wrongly entered. It also provides getter functions to maintain data encapsulation.

Date
- Day : int
- Month : int
- Year : int
<< constructor>>
+Date()
+getday() : int
+getmonth() : int
+getyear() : int

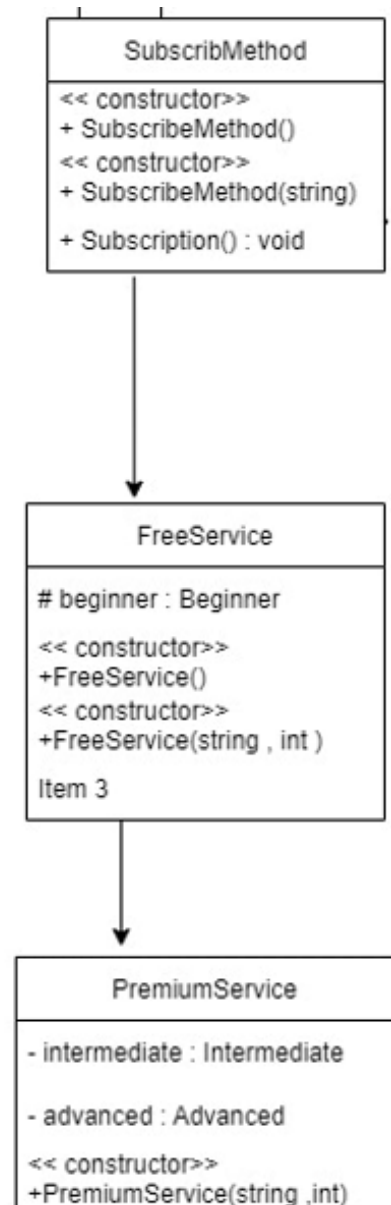
Login
- Email :string
- Password : string
- Diagnostic(string) : voic

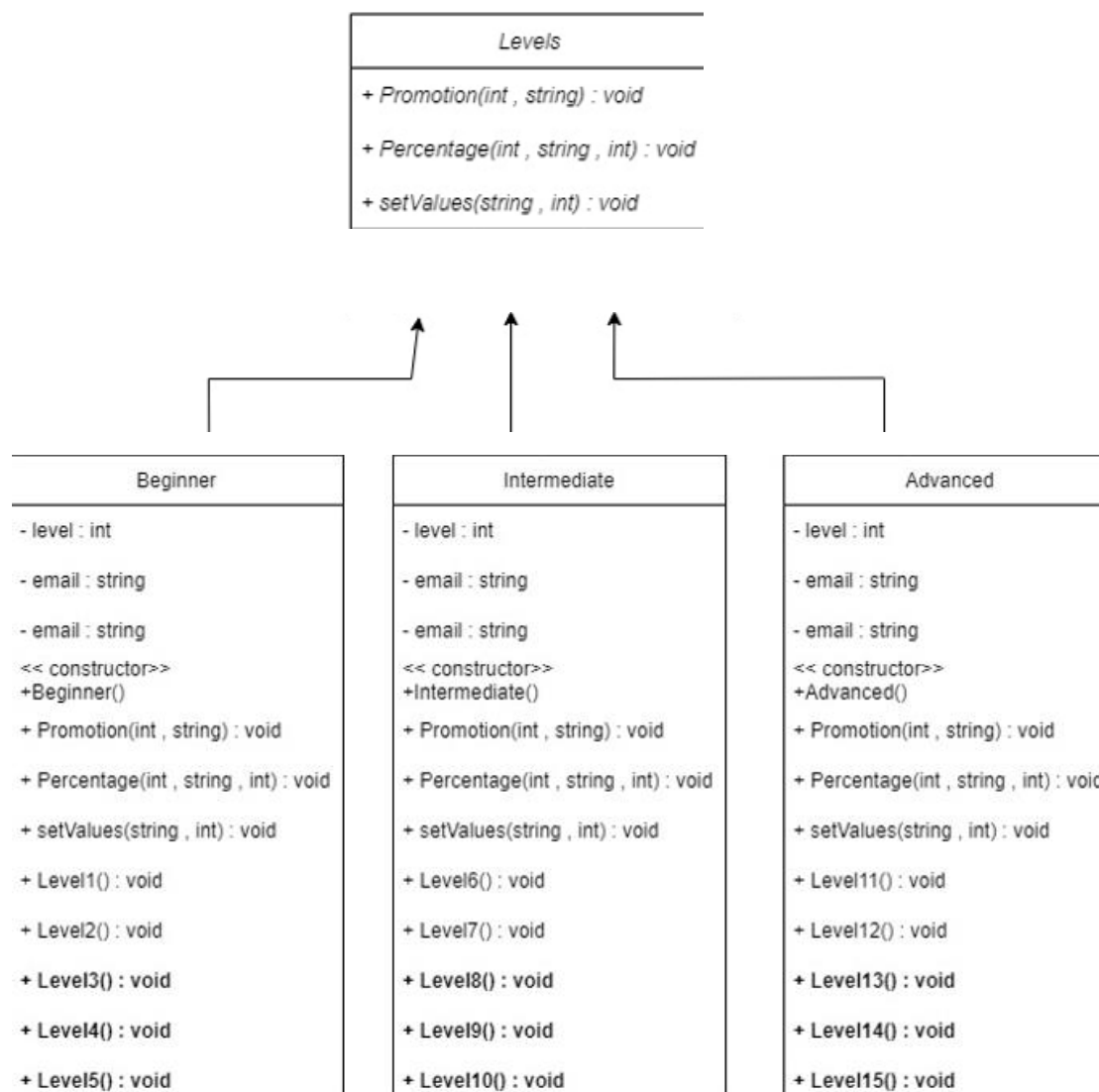
The class **Login** plays the most pivotal role in the project. It has access to the **Signup.txt** file which, after checking allows the user to continue from his respective level if he already has subscription to the course. If not, the user is asked to subscribe to be able to learn C++. The login class also has access to **Level.txt** file which stores the current level of a user and continues his lectures from where he left last time

The Inheritance and Encapsulation features of C++ are targeted in the above three classes. **SubscribMethod** gives users an option to subscribe for the two services the course offers: Free and Premium. Free Service only allows users to study up to the Beginner level whereas the Premium Service gives access to all the levels of the course. **SubscribMethod** also takes the Bank Details of the user, if he opts for the Premium Service. The class stores the Subscription Method in a file by the name of **SubscribMethod.txt**. **SubscribMethod** also uses the **Diagnostic.txt** file to take a Diagnostic test of a new user. The Diagnostic test puts the user according to his current knowledge of the subject.



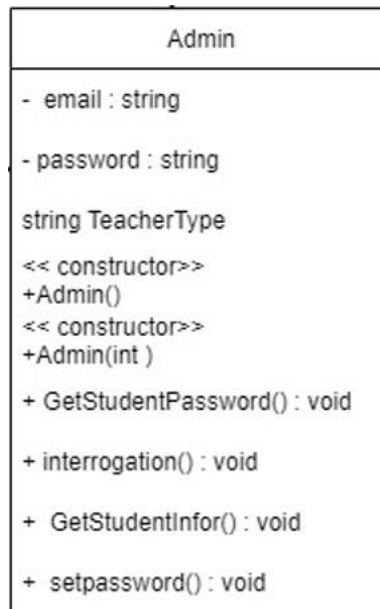
The class **BankDetails** takes the Premium users' information and stores it in a text file by the name of **BankDetails.txt**. The class interacts with **SubscribMethod** to accomplish the task.





**Levels** is an abstract class that specifically targets the polymorphism concept of the C++. **Beginner**, **Intermediate** and **Advanced** classes have inherited from the **Levels** class. Each of the three classes contains five levels as presented in the diagram above. After successful completion of each level the user is promoted to the next level. Level 5 of the Beginner level provides an option to the Free Subscriber to switch to the Premium level after providing bank details.





The class **Admin** is utilized by the teachers. Signup and Login both are dealt in the same class. Using the class, Teachers can see the information of the students. Moreover, the class provides a detailed analysis of the student's progress via **GetStudentProgress** function. The interaction is accomplished with the assistance of **Percentage.txt**, **Level.txt** and **Admin.txt** files.

### Future amendments to the Project.

- Teachers can change the content of the files.
- Weekly assignments assigned to the students through emails and submitted on the application.
- Email confirmation is sent whenever successful registration is done.
- A menu showing all the levels.
- Students can go back to the already studied levels.
- Electronic Certificate generated on the completion of the course.
- Daily Brain teasers.