Assignment - 4

Title : Design and implement of analysis model Class model for NBA Attainment System

Problem Statement :

- Prepare Analysis Model-Class Model. Identify Analysis Classes and assign responsibilities.
- Prepare a Data Dictionary.
- Draw Analysis class Model using UML2.0 Notations.
- Implement Analysis class Model-class diagram with a suitable object oriented language.

Objective :

- To Identify Analysis Classes and assign responsibilities.
- To Draw Analysis class Model
- To Implement Analysis class Model-class diagram

Theory :

- Class Diagram:
  The Class diagram shows the building blocks of any object-orientated system. Class diagrams depict the static view of the model or part of the model, describing what attributes and behaviors it has rather than detailing the methods for achieving operations. Class diagrams are most useful to illustrate relationships between classes and interfaces.Generalizations, aggregations, and associations are all valuable in reflecting inheritance,composition or usage, and connections, respectively.

- Associations
  An association implies two model elements have a relationship - usually implemented as an instance variable in one class.

- Generalizations
  A generalization is used to indicate inheritance. Drawn from the specific classifier to a general classifier, the generalized implication is that the source inherits the target's characteristics.

For Teacher and HOD class User class is the super class. All of these, share a relationship and these relationships are known as generalized relationships.

- Aggregations

  Aggregations are used to depict elements which are made up of smaller components. Aggregation relationships are shown by a white diamond-shaped arrowhead pointing towards the target or parent class. A stronger form of aggregation - a composite aggregation - is shown by a black diamond-shaped arrowhead and is used where components can be included in a maximum of one composition at a time.

- Composition:
  The composition is a special type of aggregation which denotes strong ownership between two classes when one class is a part of another class.

Classes

A class is an element that defines the attributes and behaviors that an object is able to generate.

Classes of NBA Attainment System are :

- User Class
- Teacher Class
  It manages all operations of the teacher.
- SubjectCoordinator Class
  It manages all operations of the subject-coordinator.
- HoD Class
  It manages all operations of HOD.

Class Notation

Classes are represented by rectangles which show the name of the class and optionally the name of the operations and attributes.Classes are composed of three things: a name, attributes, and operations.

Attributes:

- User-
  Name, College_id, Email_id, Designation, CO, PO , mapping, target_attainment
- Teacher Class-
  Subject, Class, Test_id , no_of_que, no-of_subque,co_per_que,maxmarks_per_que

  The subject coordinator will inherit attributes and functions of teacher class

Operations:

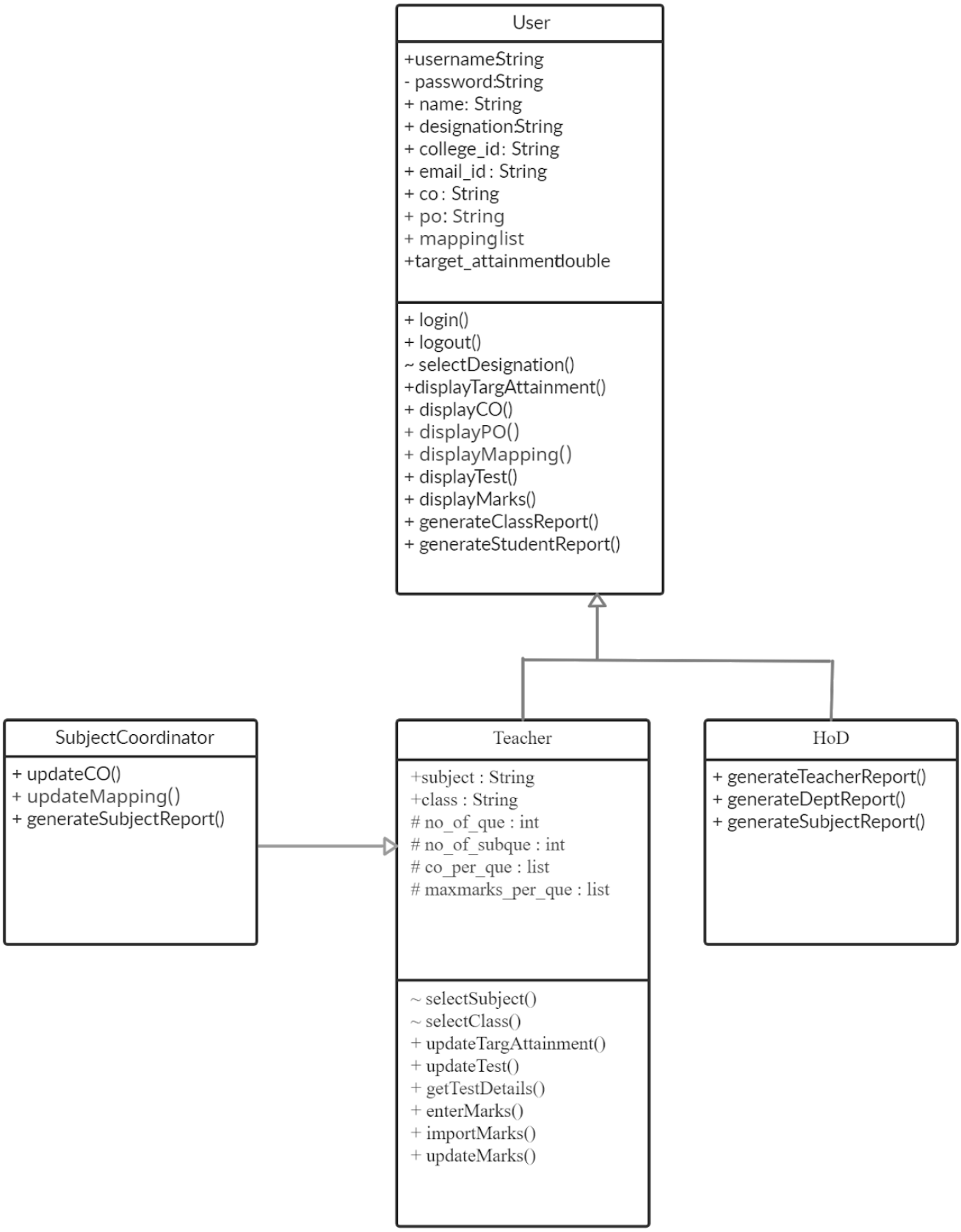
- User Class-
  login(), logout(), displayTargAttainment(), displayTest(), displayCO() ,displayPO(), displayMapping(), displayMarks(), generateClassReport(), generateStudentReport()

- Teacher Class-
  SelectSubject(), SelectClass(),updateTest(),getTestDetails(),enterMarks(),importMarks(), updateMarks()

- SubjectCoordinator Class-
  generateSubjectReport(), updateTargAttainment(), updateCO(), updateMapping()

- HoD class
  generateDeptReport(),generateSubjectReport(),generateTeacherReport()

Class Diagram for NBA Attainment System



Data Dictionary

A data dictionary is a file or a set of files that includes a database's metadata. The data dictionary holds records about other objects in the database, such as data ownership, data relationships to other objects, and other data. The data dictionary is an essential component of any relational database. Ironically, because of its importance, it is invisible to most database users. Typically, only database administrators interact with the data dictionary.

Appendix A: Data Dictionary

User = [Teacher | HoD | Subject co-ordinator]

CO = *Course Outcomes : They are the resultant knowledge skills the student acquires at the end of a course*

PO = *Program Outcomes : As stated by NBA, represent the knowledge, skills and attitudes the students should have at the end of a four year engineering program in India.*

Attainment = *Refers to how much of the target is actually achieved in the range of 0 - 1*

Target_Attainment = *Refers to the target that is set for attainment*

Report = [Class Report | Subject Report | Student Report | Teacher Report | Department Report] *Contains the target attainment as well as the actual attainment achieved*

CO_ID = *Unique ID given to a particular CO of a course*

PO_ID = *Unique ID given to a particular PO*

Course_ID = *ID of a particular course*

Test_ID = Course_ID
+ Class_ID
+ UT_ID
Unique ID given to a particular Unit Test of a particular course

Set_Test = CO_ID
+ no_of_questions
+ no_of_subquestions

+ Test_ID

Import_marks = *User can import the marks from excel sheet or CSV file*

User_ID = *ID of the teacher*

User_email = *Email of the teacher*

CO_PO_Mapping = CO_ID
+ PO_ID
+ mapping (0[mapping]3)
* Infers to mapping of particular CO to particular PO and on what level (Levels are represented as 0,1,2,3 where 0 represents no mapping)*

Conclusion:

Thus , we studied the class diagram along with identifying the features and the methods of the actors and implemented a class diagram for NBA Attainment System along with a data dictionary and implementation with object oriented language .