

Class Program:

Program will be a singleton class through which Administrator can manage all the resources of this academic programs. It has attribute studentNoLimit which is 5000, courseNoLimit which is 100, instructorNoLimit which is 10. It also has the corresponding get method and set method. It also attributes: currentStudentNO, currentCourseNO, currentInstructor, which will be used to compare with the limit number when adding new student/course/instructor. It also has attribute studentList, which contains also the student (historical and current), and a list for courses and another list for instructors. It has operation generateStudentRecord which is called inside the getStudentRecord operation, both of these two operations take student ID as input argument and return the record as string. It also has some add operations including: addStudent, addCourse, addInstructor, and some remove operations including: removeStudent, removeCourse. It also has some utility operations including generateID, which is used when adding new student/instructor/course, getCurrentSemester which take the current date time and return the term information, getInstance which returns the singleton object.

Class Participant:

Base class for class Instructor and class Student. It has attributes ID, Name, Address and PhoneNumber, and their corresponding get operations (set operation can be added later as there's too much there). Currently the name/address/phonenummer are string, they can be list of string (multiple values) if necessary.

Class Instructor:

Instructor inherit from class Participant and has some extra attributes including program and currentTechCourse, and some extra operations including createAcademicReport which takes student ID, courseID, grade and comment as input argument and return a AcademicReport object, and getCurrentCourses, which returns the current courses taught by instructor.

Class Student:

Student also inherits from class Participant, it has extra attributes isGraduated which is Boolean and is used to indicate whether or not a student is graduated, academicRecords which is a list of all students' academic records, and a list of current enrolled courses. It also has some extra operations including checkGraduatedStatus, addCourse/dropCourse and isEnrolled.

Class Course:

It has attribute id, title, description, all of which are strings, offeredSemester which is a list indicating the terms this course will be offered, instructors which is a list of instructors who taught this course in recent years, and currentStudents which is a list of current enrolled students. It also has some operations including isOffered which is to check whether this course will be offered in the given semester, addTerm/removeTerm which is used to update available terms, getOfferedSemester/getInstructors, addStudent/dropStudent.

Class AcademicReport

This class exists because of the relationship between class Student and class Course. It has required attributes: courseID, studentID, instructorID, semester, grade and comment. It has one single operation hasComment which is to check whether or not there is a comment on this report.