

CS 1180 Project 5

PURPOSE: This assignment demonstrates the use of inheritance, enums, and the saving of data.

PROCEDURES: You are to write a program using the supplied Student Class and 3 enum specifications. You are to extend the Student Class and create the Undergraduate and Graduate classes. Your main method is to use methods to ADD, REMOVE, LIST, SAVE, SORT objects from all three classes in an ArrayList of type Student.

PROGRAM: The main method of your program will provide a menu of actions to perform on an ArrayList of type student. The menu includes:

adding a member and populating all of that member's fields,
removing a member from the ArrayList given the member's UID number,
listing the contents of the ArrayList using the Class's toString method,
saving the contents of the ArrayList to a file, and
sorting the ArrayList in ascending UID order.

→ You are not to modify the Student Class.

→ You are not to modify the following enums: (*Hint: These can be files that are created in the project package*)

a) enum ClassStanding {FRESHMAN, SOPHOMORE, JUNIOR, SENIOR, UNKNOWN, MASTERS_STUDIES, PHD_STUDIES}

b) enum Major {CS, CEG, EE, ISE, BME, ME, MET, UNKNOWN}

c) enum StudentType {UNDERGRADUATE, GRADUATE, UNDECLARED}

→ You must use the enums listed above. Undeclared students are of type Student.

→ Valid input commands and enum choices should be case insensitive.

→ Listing the ArrayList is to be done by the toString methods in the 3 Classes: Student, Graduate, and Undergraduate.

→ You are to use the following UML to create the 2 new classes (UnderGraduate and Graduate "is a" Student)

UnderGraduate	Graduate
<ul style="list-style-type: none">- major; Major- overallGPA; double- majorGPA: double	<ul style="list-style-type: none">- majorProfessor; String- thesisOption; boolean
+UnderGraduate() +UnderGraduate(firstName:String,lastName:String, uid:String,studentType:StudentType, studentClassStanding:ClassStanding,studentMajor: Major,overallGPA:double,majorGPA:double) + setMajor(studentMajor: Major):void + getMajor():Major + setOverallGPA(overallGPA: double):void + getOverallGPA():double + setMajorGPA(majorGPA double):void + getMajorGPA():double + toString():String	+ GraduateStudent() +GraduateStudent(firstName:String,lastName:String, uid:String,studentType:StudentType, studentClassStanding:ClassStanding,majorProfessor: String,thesisOption:Boolean) + setMajorProfessor(majorProfessor: String):void + getMajorProfessor():String + setThesisOption(boolean thesisOption: boolean):void + getThesisOption():Boolean + toString():String

Sample inputs and outputs are given below:

ADD

LIST followed by printout of the SAVE File

Enter what you want to do- ADD, REMOVE, LIST, SAVE: add
Enter the Student's first name: Mike
Enter the Student's last name: Ondrasek
Enter the Student's UID: 12345
Enter the student status: GRADUATE, UNDECLARED, or UNDERGRADUATE: Graduate
Enter YES for having a thesis option else NO: yes
Enter Masters for Master Studies or Phd for Phd studies: Masters
Enter the name of the major professor: Dr. K

Do more? Type YES or NO: yes
Enter what you want to do- ADD, REMOVE, LIST, SAVE: add
Enter the Student's first name: Sam
Enter the Student's last name: Spade
Enter the Student's UID: 11122
Enter the student status: GRADUATE, UNDECLARED, or UNDERGRADUATE: undeclared
Enter the student class standing:
Freshman, Sophomore, Junior, Senior, or Unknown: Freshman

Do more? Type YES or NO: yes
Enter what you want to do- ADD, REMOVE, LIST, SAVE: add
Enter the Student's first name: Betty
Enter the Student's last name: Boop
Enter the Student's UID: 98765
Enter the student status: GRADUATE, UNDECLARED, or UNDERGRADUATE: undergraduate
Enter the student's major: CS, CEG, EE, ISE, BME, ME, MET, or UNKNOWN: CS
Enter the student's overall GPA: 3.3
Enter the student's major GPA: 3.2
Enter the student class standing:
Freshman, Sophomore, Junior, Senior, or Unknown: Senior

Do more? Type YES or NO: yes
Enter what you want to do- ADD, REMOVE, LIST, SAVE: list

Student Mike Ondrasek whose UID is 12345 is a GRADUATE student doing MASTERS_STUDIES work. The student's major professor is Dr. K. The student will write a thesis.

Student Sam Spade whose UID is 11122 is a UNDECLARED student doing FRESHMAN work.

Student Betty Boop whose UID is 98765 is a UNDERGRADUATE student doing SENIOR work. The student's major is CS has an overall GPA of 3.3 and a major GPA of 3.2

Do more? Type YES or NO: yes
Enter what you want to do- ADD, REMOVE, LIST, SAVE: save
Enter the file name: Output.txt

The contents of Output.txt file as copied from NotePad:

Mike
Ondrasek
12345
GRADUATE
MASTERS_STUDIES
Dr. K
true
Sam
Spade
11122
UNDECLARED
FRESHMAN
Betty
Boop
98765
UNDERGRADUATE
SENIOR
CS
3.3
3.2

Grading:

(80 pts) Correctly produces the correct output

(10 pts) Correct and complete implementation of the Graduate Class

(10 pts) Correct and complete implementation of the Undergraduate Class

(10 pts) Correct implementation and use of ArrayList<Student>

(10 pts) Correct implementation of the ADD option

(10 pts) Correct implementation of the REMOVE option

(10 pts) Correct implementation of the LIST option (output is done with the Class toString methods)

(10 pts) Correct implementation of the SAVE option

(10 pts) Correct implementation of the SORT option

(20 pts) Style

(10 pts) meaningful identifiers and method names

(10 pts) javadoc documentation in the main and supporting methods

(10 pts) javadoc documentation in the Graduate and Undergraduate classes

More input and output samples below

SORT

Do more? Type YES or NO: yes
Enter what you want to do- ADD, REMOVE, LIST, SAVE, SORT:
list

Student Mike Ondrasek whose UID is 9876 is a
UNDECLARED student doing FRESHMAN work.

Student Sam Spade whose UID is 9999 is a
UNDECLARED student doing FRESHMAN work.

Student Betty Boop whose UID is 1234 is a
UNDECLARED student doing FRESHMAN work.

Do more? Type YES or NO: yes
Enter what you want to do- ADD, REMOVE, LIST, SAVE, SORT:
sort

Do more? Type YES or NO: yes
Enter what you want to do- ADD, REMOVE, LIST, SAVE, SORT:
list

Student Betty Boop whose UID is 1234 is a
UNDECLARED student doing FRESHMAN work.

Student Mike Ondrasek whose UID is 9876 is a
UNDECLARED student doing FRESHMAN work.

Student Sam Spade whose UID is 9999 is a
UNDECLARED student doing FRESHMAN work.

REMOVE

Do more? Type YES or NO: yes
Enter what you want to do- ADD, REMOVE, LIST, SAVE, SORT: list

Student Mike Ondrasek whose UID is 12345 is a
GRADUATE student doing MASTERS_STUDIES work.
The student's major professor is Dr. K. The student will write a thesis.

Student Sam Spade whose UID is 11122 is a
UNDECLARED student doing FRESHMAN work.

Student Betty Boop whose UID is 98765 is a
UNDERGRADUATE student doing SENIOR work. The student's
major is CS has an overall GPA of 3.3 and a major GPA of 3.2

Do more? Type YES or NO: yes
Enter what you want to do- ADD, REMOVE, LIST, SAVE, SORT:
remove

Enter the UID of the student that is to be removed: 12345
Student with UID 12345 has been removed.

Do more? Type YES or NO: yes
Enter what you want to do- ADD, REMOVE, LIST, SAVE, SORT: list

Student Sam Spade whose UID is 11122 is a
UNDECLARED student doing FRESHMAN work.

Student Betty Boop whose UID is 98765 is a
UNDERGRADUATE student doing SENIOR work. The student's
major is CS has an overall GPA of 3.3 and a major GPA of 3.2

Save your project by creating a zip file of the entire project. Upload your zip project to Pilot.

You are to also copy your main method as well as your 2 new classes: Graduate and Undergraduate into a notepad or word file (.txt or .docx) and also upload those files to Pilot.

Note: *There is no valid excuse for turning in a program which does not compile. A program will receive no credit if it does not compile. Period. Partial credit can be earned on a functioning program that meets some, but not all, of the design requirements or partially solves the problem.*