COP 3330- Fall 2022

Project 1

1) This project can be completed in groups (max 3 per group) but submission on Webcourses is individual. Don't copy anybody's work nor give your code to anybody unless you **seriously** worked together on the project.

2) Please Submit **ONE** java file (Project1.java). It should look like this:

```
 public class Project1 {

     public static void main(String[] args){
     //Test code goes here
     }

  }

 //---------------------------
  class Faculty{

  }

//---------------------------
  class Student{

  }
```

3) Apply the Java naming conventions. See ***JavaNamingConventions.pdf*** posted on Webcourses

4) If you work with a classmate(s), your .java file must contain the following comment:

/*
- Project 1
- Names (first and last names) of all students who worked together on the project
- (optional) Add anything that you would like the TA to be aware of

*/

Example:

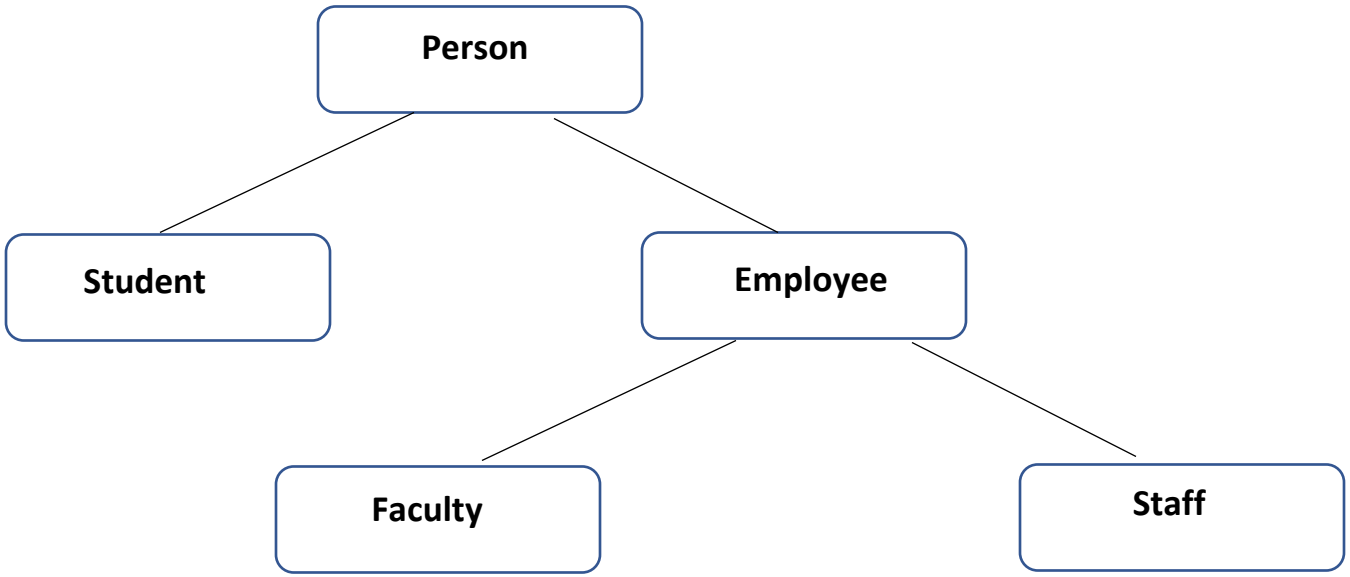
```
/*

-  Project 1
-  Joe Doe, Ericka Edwards and Jamal Dubois

*/


public class Project1 {

   public static void main(String[] args){
   //Test code goes here
   }

   }


//---------------------------
   class Faculty extends …{

   }

//---------------------------
   class Student{

   }
```

Students will not receive any credit if they don't submit the .java file by the deadline!
Submissions by email will not be considered for a grade. Students must submit their projects on Webcourses by uploading the .java file. It is the responsibility of the students to check their submissions to make sure that the file they submitted is indeed the right file and it is a readable file!

Project 1 statement

Please read this entire statement carefully before you start doing anything…

This project involves implementing a simple university personnel management program. Your Java program must contain all the classes shown in the inheritance hierarchy below:



Your program stores relevant information such as university ID, name, etc. Different information is stored depending on the type of the object. For example, a student has a GPA, a faculty has a title and department (professor, mathematics).

For each data member, your program must include a **getter** and a **setter**, and each class must include at least **two constructors**. The goal of this Project is to demonstrate the use of classes, inheritance, abstract classes, abstract methods, and method overriding.

For a student, we need to store:

- full name
- id
- gpa
- Number of credit hours currently taken

For a faculty, we need:

- full name
- id
- department (mathematics, engineering or sciences)
- Rank (professor or adjunct)

For a staff, we need a:

- full name
- id
- department (mathematics, engineering or sciences)
- status (part time or full time)

Students in this college pay $236.45 per credit hour in addition to a $52 administrative fee. Your code should generate a tuition invoice. Note that students get a 25% off total payment if their gpa is greater or equal to 3.85.

As show in the inheritance hierarchy above, both classes **Student** and **Employee** inherit from the class **Person**. The classes **Person** and **Employee** must be abstract. The class **Person** must include: ***public abstract void print();***

The abstract method ***print*** is overridden to:

- print the fee invoice for a student.
- print the information of a faculty
- print the information of a staff

It is left to you (the programmer) to come out with other abstract methods if you see fit (this is optional).

Besides the classes mentioned above, your code must add the class ***Personnel***, the class whose private field is the array of type ***Person*** (name it ***list*** of size 100) where you store the faculty, staff and student objects. See sample run below to determine the additional fields and methods needed to complete your project.

c

Note that your code must use **ONE** array of size 100 of type Person as mentioned above (It must be an array, not an arraylist, linked list, hash map nor anything else…).

Please note well that:

1) Your code should run as shown on the sample run below (However, the TA will not deduct points because you skipped two lines instead of three or your tuition invoice has 56 hyphens instead of 63!).
2) When asked to enter the faculty's department, **matheMatics** and **MathematiCs** are considered to be the same. Your program should display ***Mathematics*** if faculty information is to be displayed to the screen. However, if the user enters ***Mathematics department***, then this is an invalid entry. Consider these departments only: Mathematics, Engineering and Sciences. As for the rank of a faculty, consider these ranks only: Professor and Adjunct.
3) The university ID has no required form so you may choose to enter anything to be the ID. **However, no two persons can have the same id.**
4) Once again, your code should handle up to 100 people (faculty, staff and students combined)

Sample Run: (Below is how your code should run)

```
                                    Welcome to my Personnel Management Program


Choose one of the options:

1- Enter the information a faculty
2- Enter the information of a student
3- Print tuition invoice for a student
4- Print faculty information
5- Enter the information of a staff member
6- Print the information of a staff member
7- Exit Program

     Enter your selection: 2


Enter the student info:

          Name of Student: Julia Alvarez

          ID: ju1254

          Gpa: 3.26

          Credit hours: 7

Student added!


1- Enter the information a faculty
2- Enter the information of a student
3- Print tuition invoice for a student
4- Print faculty information
5- Enter the information of a staff member
6- Print the information of a staff member
7- Exit Program
```

```
     Enter your selection: 2



Enter the student info:
           Name of Student: Matt Jones
           ID: ma0258
           Gpa: 2.78
           Credit hours: 0
Student added!



1- Enter the information of the faculty
2- Enter the information of the two students
3- Print tuition invoice
4- Print faculty information
5- Enter the information of the staff member
6- Print the information of the staff member
7- Exit Program
     Enter your selection: A


Invalid entry- please try again


   1. Enter the information of a faculty
   2. Enter the information of a students
   3. Print tuition invoice
   4. Print faculty information
   5. Enter the information of a staff member
   6. Print the information of a staff member
   7. Exit Program
     Enter your selection: 1
```

Enter the faculty info:

Name of the faculty: **John Miller**

ID: **jo7894**

Rank: **Instructor**

"Instructor" is invalid

Rank: **Assistant Professor**

"Assistant Professor" is invalid

Rank: **Professor**

Department: **Engineering**

Faculty added!

1. Enter the information of a faculty
2. Enter the information of a students
3. Print tuition invoice
4. Print faculty information
5. Enter the information of a staff member
6. Print the information of a staff member
7. Exit Program

Enter your selection: **3**

Enter the student's is: **ju1254**

Here is the tuition invoice for Julia Alvarez :

Julia Alvarez ju1254

Credit Hours:7 ($236.45/credit hour)

Fees: $52

Total payment: $1,707.15 ($0 discount applied)

---

1. Enter the information of a faculty
2. Enter information of a students
3. Print tuition invoice
4. Print faculty information
5. Enter the information of a staff member
6. Print the information of a staff member
7. Exit Program

Enter your selection: **3**

Enter the student’s is: **ja1954**

No student matched!

1. Enter the information of the faculty
2. Enter information of the two students
3. Print tuition invoice
4. Print faculty information
5. Enter the information of the staff member
6. Print the information of the staff member
7. Exit Program

Enter your selection: **4**

Enter the Faculty's id: jo7894

John Miller jo7894

Engineering Department, Professor

---

1. Enter the information of a faculty
2. Enter information of a students
3. Print tuition invoice
4. Print faculty information
5. Enter the information of a staff member
6. Print the information of a staff member
7. Exit Program

Enter your selection: **6**

Enter the Staff's id: **ha5879**

No Staff member matched!

1. Enter the information of a faculty
2. Enter information of a students
3. Print tuition invoice
4. Print faculty information
5. Enter the information of a staff member
6. Print the information of a staff member
7. Exit Program

Enter your selection: **5**

Name of the staff member: **Jamal Kareem**

Enter the id: **ja6980**

Department: **Sciences**

Status, Enter P for Part Time, or Enter F for Full Time: **f**

Staff member added!

1. Enter the information a faculty
2. Enter information of a students
3. Print tuition invoice
4. Print faculty information
5. Enter the information of a staff member
6. Print the information of a staff member
7. Exit Program

Enter your selection: **6**

Enter the Staff’s id: **ja6980**

```
--------------------------------------------------------------------------------

Jamal Kareem           ja6980

Sciences Department, Full Time

--------------------------------------------------------------------------------



1. Enter the information a faculty
2. Enter information of a students
3. Print tuition invoice
4. Print faculty information
5. Enter the information of a staff member
6. Print the information of a staff member
7. Exit Program


Enter your selection: 7


Goodbye!
```