The American University in Cairo
School of Sciences and Engineering
Department of Computer Science and Engineering

Fundamentals of Computing II
CSE 1101 03/04
Assignment 2
Inheritance and Polymorphism

Payroll System Using Inheritance and Polymorphism

Define the following constants in your program.

FACULTY_MONTHLY_SALARY = 5000.00
STAFF_MONTHLY_HOURS_WORKED = 160
Implement an abstract class Employee with the following requirements:

Attributes:
last name (String)
first name (String)
ID number (String)
Sex - M or F
Birth date (Date)

Public methods:
Constructor and default constructor
putData that displays the following information:
ID Employee number :_____
Employee name: _____
Birth date: _____
get and set methods
pure virtual method monthlyEarning that returns the monthly earning.

Implement a class called Staff extending from the class Employee with the following requirements:

Attribute:
Hourly rate

Public methods:
Constructor and default constructor
get and set methods
The method monthlyEarning returns monthly salary (hourly rate times 160)
putData that displays the following information:
ID Employee number :_____
Employee name: _____
Birth date: _____
Full Time
Monthly Salary: _____

Implement a class Education with the following requirements:

Attributes:
Degree (MS or PhD)
Major (Engineering, Chemistry, English, etc ...)
Research (number of researches)

Public methods:
Constructor and default constructor
get and set methods

Implement a class Faculty extending from the class Employee with the following requirements:

Attributes:
Level
"AS": assistant professor
"AO": associate professor
"FU": professor
Education object (an object of the class Education)

Public methods:
Constructor and default constructor
get and set methods
The method monthlyEarning returns monthly salary based on the faculty's level.
AS - faculty monthly salary
AO - 1.2 times faculty monthly salary
FU - 1.4 times faculty monthly salary
putData that displays the following information:
ID Employee number :_____
Employee name: _____
Birth date: _____
XXXXX Professor where XXXXX can be Assistant, Associate or Full
Monthly Salary: _____

Implement a class called Partime extending from the class Staff with the following requirements:

Attributes:
Hours worked per week

Public methods:
Constructor and default constructor
set and get methods
The method monthlyEarning returns monthly salary which hourly rate multiplied hours worked per week multiplied four.
putData that displays the following information:
ID Employee number :_____
Employee name: _____
Birth date: _____
Hours works per month: _____
Monthly Salary: _____

Implement a test driver program that creates a one-dimensional array of class Employee to store the objects Staff, Faculty and Partime.

Using polymorphism, display the following outputs:

a. Employee information using the method putData.

All employees
Staff
Faculty
Part-time

b. Total monthly salary for all the part-time staff .
c. Total monthly salary for all employees.

Test Data

Staff
Last name: Allen
First name: Paita
ID: 123
Sex: M
Birth date: 2/23/59
Hourly rate: $50.00
Last name: Zapata
First Name: Steven
ID: 456
Sex: F
Birth date: 7/12/64
Hourly rate: $35.00
Last name:Rios
First name:Enrique
ID: 789
Sex: M
Birth date: 6/2/70
Hourly rate: $40.00

Faculty
Last name: Johnson
First name: Anne
ID: 243
Sex: F
Birth date: 4/27/62
Level: Full
Degree: Ph.D
Major: Engineering
Reseach: 3
Last name: Bouris
First name: William
ID: 791
Sex: F
Birth date: 3/14/75
Level: Associate
Degree: Ph.D
Major: English
Reseach: 1
Last name: Andrade
First name: Christopher
ID: 623
Sex: F
Birth date: 5/22/80
Level: Assistant
Degree: MS
Major: Physical Education
Research: 0

Part-time
Last name: Guzman
First name: Augusto
ID: 455
Sex: F
Birth date: 8/10/77
Hourly rate: $35.00
Hours worked per week: 30

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Last name: Depirro
First name: Martin
ID: 678
Sex: F
Birth date: 9/15/87
Hourly rate: $30.00
Hours worked per week:15
Last name: Aldaco
First name: Marque
ID: 945
Sex: M
Birth date: 11/24/88
Hourly rate: $20.00
Hours worked per week: 35

Rules:

- Assignments are to be done individually.
- You should not use templates or vectors in your code.
- You are required to submit a single cpp file, with your name as the title of the file. No additional report is required.
- Submitting code that contains syntax errors (a code that does not run) automatically results in a grade of zero in the assignment.
- 70% of the grade of the assignment is for logical code correctness
- 20% of the grade is on code efficiency. Creating additional variables or operations that can be summarized or reduced will be penalized. You are required to examine your code and see what can be optimized.
- 10% of the grade is for proper documentation of the code. You are required to insert comments to explain what every function does.

By submitting this assignment, I affirm that I have followed AUC's Code of Academic Ethics and the work submitted is my own. I have not consulted unauthorized resources or materials nor collaborated with other individuals unless allowed.