

Object Oriented Programming Assignment 2

Author: Kasun Ranga Wijeweera

Email: krw19870829@gmail.com

Date: 2018 April 7

- 1) Suppose you have to develop an information system for a food city. Points are added to the customer depending on the purchases made. The customers are grouped based on the number of points.
 - a) Create a class called **Customer** that includes attributes: **id**, **name**, **points**, **group**, and **avg** with data types: “**int**”, “**String**”, “**double**”, “**String**”, and “**double**” respectively.
 - b) Include a constructor with parameters: **id** and **name**.
 - c) Include another constructor to assign default values to the attributes.
 - d) Include a method called **addPoints** that is used to add a given amount to the value of the attribute **points**.
 - e) Include a method called **upgradePoints** that is used to increase the value of the attribute **points** by a given percentage.
 - f) Include a method called **removePoints** that is used to reduce a given amount from the value of the attribute **points**. If the resultant value is negative then the value of the attribute should be set into zero.
 - g) Include a method called **computeGroup** that assigns a value to the attribute **group** based on the value of the attribute **points** as given in the following table.

points	group
$\text{points} < 100$	Silver
$100 \leq \text{points} < 500$	Gold
$500 < \text{points} \leq 2000$	Platinum
$2000 < \text{points}$	Diamond

- h) Include a method called **display** to display the values of all the attributes of a **Customer** object.
 - i) Include a static method called **displayAvg** to display the value of the attribute **avg**.

- j) The attribute **avg** should be assigned the average value of points of each customer. Include a static method called **calAvg** to calculate the value of the attribute **avg**.
- k) Include a static method called **getBest** that returns the value of the attribute **id** of the customer with maximum number of points.
- l) Create the driver class called **Test** that includes the “**main**” method.
- m) Create an array that holds five **Customer** objects. Assign the objects given in the following table to each array element using the parameterized constructor.

id	1543	6561	6954	3485	8546
name	Nimal	Saman	Kasun	Nayana	Kalpa

- n) Use the method **addPoints** to add following points respectively to each **Customer** object created above.

129	785	3258	59	1652
-----	-----	------	----	------

- o) Add extra 1000 points to the third customer using the method **addPoints**.
- p) Increase the points of the second customer by 2% using the method **upgradePoints**.
- q) Include a method called **display** to the class **Test** that displays all the attributes of each customer. Each set of attributes should be separated by a sequence of dots. The part of output for the first customer is given below.

.....
Customer: 1
ID: 1543
Name: Nimal
Points: 129.0
Group: null
Average: 0.0

- r) Invoke the method **display** of the class **Test**.
- s) Compute the average of points using the method **calAvg**.
- t) Compute the group of each customer using the method **computeGroup**. You should use a loop.

- u) Again invoke the method **display** of the class **Test**.
- v) Display the value of the attribute **id** of the customer with highest number of points using the method **getBest**.
- w) Invoke the method **displayAvg** using each **Customer**, **c[0]**, **c[1]**, **c[2]**, **c[3]**, and **c[4]** as references.
- x) Create a reference variable called **cust** of type **Customer**.
- y) Assign fifth **Customer** object to the reference variable **cust**. You should use the object you have already created.
- z) Reduce 2000 points from the fifth customer using the method **removePoints**. You should invoke the method using the reference variable **cust**.
- aa) Invoke the method **display** of the class **Customer** using the array element **c[4]** to display the values of attributes of the fifth customer.
- bb) Update the group of the fifth customer invoking the method **computeGroup**.
- cc) Invoke the method **calAvg** again to find the new average of points.
- dd) Create a **Customer** object with default values to its attributes by using the appropriate constructor. The object should be assigned to the reference variable **cust**.
- ee) Copy the values of the attributes of the fourth customer to the corresponding attributes of the object pointed by the reference variable **cust**.
- ff) Create another reference variable called **cust1** of type **Customer**.
- gg) Assign the object pointed by the reference variable **cust** to **cust1** as well.
- hh) Delete the object pointed by the reference variable **cust**.
- ii) Execute the statement **cust1.id** to verify the deletion of the object.