Methods: Exercises

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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
points < 100	Silver
100 ≤ points < 500	Gold
500 < points ≤ 2000	Platinum
2000 < 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 expected 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.