CSE-2214

Object Oriented Programming Sessional

Week-03

(Class & Object)

Task-1

Suppose you are developing a software for a library. What type of object do you need to handle frequently? ***Books,*** right? There might be variety of functionalities for a library like searching and sorting books, lending/returning books, member information, add/remove books etc. But the main objects you will work with will be the book objects. That mean you need to define a ***Book*** class first. Let's think about the basic properties/attributes of a ***Book.*** A book must have a title and author. Also, you can include the price, number of pages, publication, edition for more details of the ***Book.***

Now write a JAVA class named ***Book*** with the attributes, mentioned here. Furthermore, add a method called ***showInfo(),*** that prints a full description of the book object. This method should not return anything.

Task-2

Do the following tasks:

- Create a new JAVA class, named **Task_2**.
- Add a ***main*** method in the newly created class.
- Create three ***Book*** objects (from Task-1) with the names: ***book1, book2, book3***.
- Set the following information accordingly:

book1	***book2***	***book3***
JAVA for Beginners 3rd edition	Omega Point 12th edition	Digital Fortress 5th edition
By Prof. David	By Humayun Ahmed	By Dan Brown
537 pages	122 pages	356 pages
Price: 299 tk	Price: 128 tk	Price: 520 tk
Easy Coding Publications	Shomoy Prokashoni	St. Martin Press

- Call ***showInfo()*** method for all books.
- Print the memory address of all objects.
- Set ***book1 = book3.***
- Set the edition to **1** for ***book1***.
- Call ***showInfo()*** method for ***book3*** again.
- Print the memory address of all objects again.

Before running the code, brainstorm for a few moment and try to guess the output of the program. Finally, run the program and compare with your guess. Observe and understand what is happening in each statement.

Task-3

Suppose that, an Electricity company charges its customers according to the different usage category. In other words, the charge rate varies with the unit of usage. The basic charge is calculated with the following rates:

Unit	Charge/unit
upto 199	@1.20
200 and above but less than 400	@1.50
400 and above but less than 600	@1.80
600 and above	@2.00

Additionally, if the bill exceeds tk. 400 then a surcharge of 15% will be charged. And finally, the minimum bill should be at least tk. 100/-, that is, if there is no usage or the bill is less than 100, the customer has to pay the minimum bill 100tk.

Now, we will create a JAVA class to calculate the bill. Do the following tasks:

- create a class **BillCalculator**
- add a method ***calculateBasicBill(double unit)*** that returns the basic bill according to the chart above
- add another method ***calculateSurcharge(double basicBill),*** that returns the amount of surcharge the customer has to pay.
- Add another method ***getTotalBill(double unit),*** that first calls the ***calculateBasicBill()*** method to get the basic bill and then send it to the ***calculateSurcharge()*** method to get the amount of surcharge. Finally, it will calculate the total bill and return it.
- Create another class **Task_3** with a main method
- Inside the main, create an object of **BillCalculator** and print the bills for 25, 250 and 812 unit of usage.

Now, it's time to brainstorm for a few moments. Observe the **Book** class and **BillCalculator** class. What do you think the difference between these two classes?