Object Oriented Programming Assignments

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1. Define a class named Customer with instance members as `id` and `name` and input the data using `getDetails()` and display them using `showDetails()`.

   Sample Run :

   ```
   Etner id and name :
   111
   Alok

   Id : 111
   Name : Alok
   ```

2. Rewrite the above program to input and display the details of 5 customers.

   Sample Run for 2 Customer:

   ```
   Enter the details 2 Customers :
   Etner id and name :
   1001
   John
   Etner id and name :
   1002
   Merry

   Id and name of all Customers :

   Id : 1001
   Name : John


   Id : 1002
   Name : Merry
   ```

3. Rewrite the above program to input the details of 5 customers using appropriate constructor and display them using `showDetails()` method.

```
Enter the details 2 Customers :
Etner id and name :
1001
Alok
Etner id and name :
1002
Vikash

Id and name of all Customers :

Id : 1001
Name : Alok


Id : 1002
Name : Vikash
```

4. Define a class Employee input the `id`, `name` and `basic` of 5 employees and display their salary slip based on the following condition. Use the proper constructor and methods.

Basic >= $5000 and < $10000	DA: 40% of basic HRA: 20% of basic PF : 10% of basic
Basic >= $3000 and <$5000	DA: 30% of basic HRA: 20% of basic PF: 10% of basic
Basic < $3000	DA: 20% of basic HRA: 10% of basic PF: 10% of basic
Basic > =$10000	DA: 50% of basic HRA: 30% of basic PF: 10% of basic

Sample Run for 2 Employees:

```
Etner id, name and basic :
1001
John
2500
Etner id, name and basic :
1002
Merry
7000
     ++++++++++++++++++++++++++++++++++
      SALARY STATEMENT OF THE EMPLOYEES
     ++++++++++++++++++++++++++++++++++
                     AAAAAAAA Pvt. Ltd.
=====================================================
 ID              : 1001
 Name            : John
 Basic           : 2500.0
 DA(+)           : 500.0
 HRA(+)          : 250.0
 PF(-)           : 250.0

 _____________________________________
 NET Salary      : 3000.0
=====================================================
                     AAAAAAAA Pvt. Ltd.
=====================================================
 ID              : 1002
 Name            : Merry
 Basic           : 7000.0
 DA(+)           : 2800.0
 HRA(+)          : 1400.0
 PF(-)           : 700.0

 _____________________________________
 NET Salary      : 10500.0
=====================================================
```

5. Define a class Student and create instance members as `id`, `name` and `age`. Define `id` as static where the `id` will start with 1001 and the next id will be updated as 1002 and so on. Create five objects of students and display them.

Sample Run

```
ID : 1001
Name : AAA
Age : 20

ID : 1002
Name : DDD
Age : 21

ID : 1003
Name : BBB
Age : 23

ID : 1004
Name : EEE
Age : 25

ID : 1005
Name : CCC
Age : 18
```

6. Define a class **`Student`** containing `id`, `name` as instance members and two methods named `getStudent()` and `displayStudent()` as instance methods. Now create a class named **`Exam`** which is inherited from **`Student`**. The derived class contains the mark secured in three subjects' `sub1`, `sub2`, `sub3`. The derived class also contains `getMark()` and `showMark()` as instance members. Now create an array of objects of the **`Exam`** class and input the data and display the Mark Sheet of the all the Students.

   Sample Run for 2 Students:

```
Enter the data of 5 Students
Enter id and Name :
111
Raj
Enter Mark in sub1, sub2 and sub3 :
60 30 50
Enter id and Name :
222
Asit
```

```
Enter Mark in sub1, sub2 and sub3 :
40 70 50
Details are :

ID : 111
Name : Raj
Sub 1 : 60
Sub 2 : 30
Sub 3 : 50

ID : 222
Name : Asit
Sub 1 : 40
Sub 2 : 70
Sub 3 : 50
```

7. Define a method `area()` and use the method overloading concept to calculate the area of square, rectangle and circle.

8. Define an abstract method `simpleInterest(double p, double t)` to calculate the simple interest of 2 different bank. Here the `r` will be declared in site the method.

9. Define an interface `Shape` and print a line with a specific character below a text. Here `void printLine(String s)` is to declared in Shape and to be implemented by different class.

```
Hello Everybody
***************

How are you
___________
```

10. Create a package that contains a class `Employee` with `id` and `name` as instance member. It contains `input()` and `show()` methods to input and display the data respectively.

    Now create two different class named `PGteacher` and `UGteacher` that are inherited from Employee class where `course` is the data member and input and output methods of their own in both of them. Create the objects of these two class to store and display the data of all the data members.

11. Write a Java Program to access an invalid index and handle it in the ArrayIndexOutOfBoundsException.

12. Create a custom exception named ExcessMarkException. Then Create a class Student with id and mark as the instance members and throw an exception if the mark greater than 100.