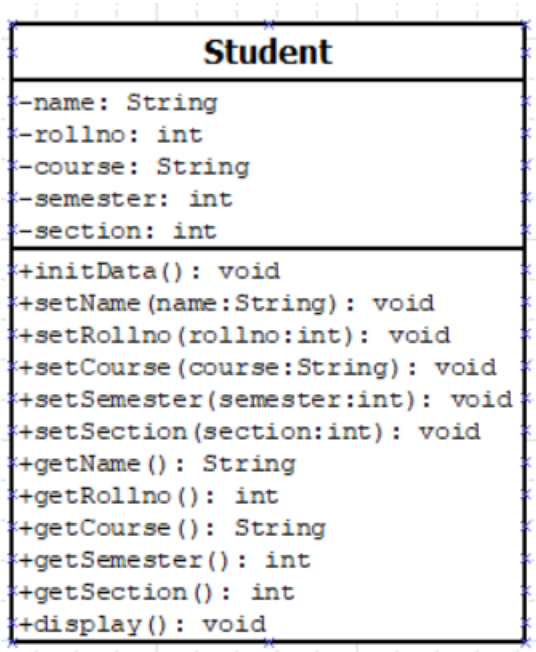
Assignment (BCAC391)

(Basic class, this keyword, getter & setter method, return type, package concept)

1. A class called **Student**, with student name, course, rollno, section, semester, is designed as shown in the following class diagram. Write the **Student** class.
   Create **Student** class within **com.student.domain** package and create **main** class within **com.testStudent.domain** package.



[Note: using initData() to initialize the default value.]

Below is the TestDriver code:

```
public class testDriver {

   public static void main(String[] args) {
      Student student1=new Student();
      student1.initData();
      //using setter method
      student1.setName("Anup Saha");
      student1.setCourse("BCA");
      student1.setRollno(123456789);
      student1.setSemester(2);
      student1.setSection('C');
      student1.display();

      //using getter and setter method
      student1.setName("Subhajit Das");
      student1.setCourse("MCA");
      student1.setRollno(223456789);
      student1.setSemester(3);
```

```
        student1.setSection('A');
        System.out.println("\nName->\t\t"+student1.getName());
        System.out.println("Roll No->\t"+student1.getRollno());
        System.out.println("Course->\t"+student1.getCourse());
        System.out.println("Semester->\t"+student1.getSemester());
        System.out.println("Section->\t"+student1.getSection());
      }
    }
```

The expected output:

```
.............Student Details.................

Name->Anup Saha
Roll No->       123456789
Course->        BCA
Semester->      2
Section->       C

Name->Subhajit Das
Roll No->       223456789
Course->        MCA
Semester->      3
Section->       A
```

2. Write a program to check a number is prime or not. Create a class **PrimeChecker** and take a variable **int number** , and create **isPrime() : Boolean** method to check a number is prime or not ,if number is prime the return **true**, create another method **takeNumber(int number)** to initialize the value of **number:int** variable. In the **main** class create an object of **PrimeChecker** class and using class members to check a number is prime or not.
   Create **PrimeChecker** class within **com.prime.domain** package and create main class within **com.testPrime.domain** package.

Below is the main class code:

```
public class TestDriver{
        public static void main(String args[]){
        PrimeChecker pc=new PrimeChecker();
        pc.takeInput(7);
        if(pc.isPrime())
        {
          System.out.println(pc.number+"is a prime number");
        }
        else
        {
          System.out.println(pc.number+"is not a prime number");
        }
        }
}
```

The expected output is:

7 is a prime number.

3. Create a Class **TaxCalculation** to calculate the tax, in the class write a method **takeIncome(double income)** to take the value of annual income, write another method **calculate()** to calculate the tax based of annual income which is given by user as per the following table.

INCOME	TAX
<=100000	NO TAX
100001- 250000	10%
250001 – 500000	20%
>500000	30%

4. Create a class **EmployeeSalary** to calculate the salary of an employee. In the class create a method **take_input()** to take **basic_salary** value and create a another method **calculate()** to calculate the Gross and Net pay of an employee based of following criteria.

Allowance/Deduction rate:
Dearness Allowance (DA) : 30% of Basic Pay
House Rent Allowance (HRA) : 15% of Basic Pay
Provident Fund (PF) : 12.5% of Basic Pay
Gross Pay = Basic Pay + Dearness Allowance + House Rent Allowance
Net Pay = Gross Pay – Provident Fund

Finally create a another method **display_salary()** to display the Gross pay and Net Pay of an employee.

5. A manufacturing company has made an increase in the cost of its vehicles as per type of engine as given below:

Type of Engine	Rate of Increment
2 strokes	10% of above cost
4 strokes	12% of above cost

Write a program to find out the new cost as per the given specification:

Class Name: Vehicle
Data Members: **int type** – to accept two type of engine, 2/4 stroke
int cost – to accept previous cost

Member Methods: **void getType()** – to accept the type of engine and previous cost.
void find() – to find the new cost as per the criteria given above.
void printcost()– to print the type and new cost of the vehicle.

6. Design a class **RailwayTicket** with the following description:

Instance variables/data members

String name – To Store name of the customer.
String coach – To store the type of coach customer wants to travel.
long mobno – To store customer's mobile number.
int amt – To store the basic amount of ticket.
int total_amt – To store the amount to be paid after updating the original amount.

Member methods

void accept() – To take input for name ,coach, mobile number and amount.
void update() – To update the amount as per the coach selected
(Extra amount to be added in the amount as follows)

Type of Coaches	Amount
First_AC	700
Second_AC	500
Third_AC	250
sleeper	None

void display() – To display all details of a customer such as name, coach, total amount and mobile number.

Write a main method to create an object of the class and call the above member methods.