Q1. Create a Java class called Student with attributes like name, rollNumber, and grade. Then, create an object of the Student class and set its attributes.

**package** project1;

**public** **class** Student {

String name;

**int** rollnum;

**char** grade;

**public** **static** **void** main(String[] args) {

Student s1 = **new** Student();

System.***out***.println(s1.name);

System.***out***.println(s1.rollnum);

System.***out***.println(s1.grade);

}

}

Q2. Modify the Student class from the previous question to include a constructor that initializes its attributes. Create an object of the Student class using this constructor

**package** project1;

**public** **class** StuCon {

String name;

**int** rollnum;

**char** grade;

**public** StuCon() {

**this**.name = "Shravani";

**this**.rollnum = 24;

**this**.grade = 'A';

}

**public** **static** **void** main(String[] args) {

StuCon s1 = **new** StuCon();

System.***out***.println("Name: "+s1.getName());

System.***out***.println("RollNumber: "+s1.getRollnum());

System.***out***.println("Grade: "+s1.getGrade());

}

}

Q3. Extend the Student class to include getter and setter methods for its attributes. Use these methods to get and set the values of the name, rollNumber, and grade attributes.

**package** project1;

**public** **class** StuCon {

String name;

**int** rollnum;

**char** grade;

**public** StuCon() {

**this**.name = "Shravani";

**this**.rollnum = 24;

**this**.grade = 'A';

}

**public** String getName() {

**return** name;

}

**public** **void** setName(String name) {

**this**.name = name;

}

**public** **int** getRollnum() {

**return** rollnum;

}

**public** **void** setRollnum(**int** rollnum) {

**this**.rollnum = rollnum;

}

**public** **char** getGrade() {

**return** grade;

}

**public** **void** setGrade(**char** grade) {

**this**.grade = grade;

}

**public** **static** **void** main(String[] args) {

StuCon s1 = **new** StuCon();

System.***out***.println("Name: "+s1.getName());

System.***out***.println("RollNumber: "+s1.getRollnum());

System.***out***.println("Grade: "+s1.getGrade());

}

}

Q4.Create a class Book with attributes like title, author, and publishedYear. Create multiple Book objects with different properties.

**package** project1;

**public** **class** Book {

String title;

String author;

**int** publishedYear;

**public** Book(String titles, String authors, **int** publishYear) {

title = titles;

author = authors;

publishedYear = publishYear;

}

**public** **static** **void** main(String[] args) {

Book b1 = **new** Book("Java", "ABC", 2001);

Book b2 = **new** Book("Python", "DEF", 2002);

Book b3 = **new** Book("Angular", "GHI", 2004);

System.***out***.println("Book 1 "+b1.title+" by "+b1.author+" Published in "+b1.publishedYear);

System.***out***.println("Book 2 "+b2.title+" by "+b2.author+" Published in "+b2.publishedYear);

System.***out***.println("Book 3 "+b3.title+" by "+b3.author+" Published in "+b3.publishedYear);

}

}

Q5.Create a class called Person with attributes name and age. Include a default constructor that sets default values for these attributes. Create an object of the Person class using the default constructor.

**package** project1;

**public** **class** Person {

String name;

**int** age;

**public** Person() {

name = "Sanjay";

age = 20;

}

**public** **static** **void** main(String[] args) {

Person p1 = **new** Person();

System.***out***.println("Name: "+p1.name);

System.***out***.println("Age: "+p1.age);

}

}

Q6.Create a class Rectangle with attributes for its length and width. Implement a method to calculate the area of the rectangle. Create an object of the Rectangle class and calculate its area

**package** project1;

**public** **class** Rect {

**double** length;

**double** width;

**public** Rect(**double** rectLength, **double** rectWidth) {

length = rectLength;

width = rectWidth;

}

**public** **double** Area() {

**return** length\*width;

}

**public** **static** **void** main(String[] args) {

Rect r1 = **new** Rect(8.0, 5.0);

System.***out***.println("The area of rectangle is: "+r1.Area());

}

}

Q7.Create a class Employee with attributes like name, employeeId, and salary. Implement a parameterized constructor that initializes these attributes. Create an object of the Employee class using this constructor

**package** project1;

**public** **class** Employee {

String name;

**int** EmpId;

**double** salary;

**public** Employee(String empName, **int** empId, **double** empSalary) {

name = empName;

EmpId = empId;

salary = empSalary;

}

**public** **static** **void** main(String[] args) {

Employee emp1 = **new** Employee("Shravani", 101, 1200000.00);

System.***out***.println("The employee details are");

System.***out***.println("Name: "+emp1.name);

System.***out***.println("Employee Id: "+emp1.EmpId);

System.***out***.println("Salary: "+emp1.salary);

}

}

Q8.Create a class Circle with a private attribute radius and a method to calculate its area. Implement getter and setter methods for the radius attribute and use them to set the radius and calculate the area of a circle.

**package** project1;

**public** **class** Circle {

**private** **double** radius;

**public** **double** Area() {

**if**(radius<=0) {

System.***out***.println("Please enter the correct value");

}

**return** radius;

}

**public** **double** getRadius() {

**return** radius;

}

**public** **void** setRadius(**double** radius) {

**this**.radius = radius;

}

**public** **double** Caluclate() {

**return** Math.***PI***\*radius\*radius;

}

**public** **static** **void** main(String[] args) {

Circle c1 = **new** Circle();

c1.setRadius(7.0);

System.***out***.println(c1.getRadius());

System.***out***.println(c1.Caluclate());

}

}

Q9.Create a class MathUtils with a static method that calculates the factorial of a number. Use this method to calculate the factorial of a given number.

**package** project1;

**public** **class** MathUtils {

**public** **static** **int** Factorial(**int** n) {

**if**(n==0 ||n==1) {

**return** 1;

}

**else** {

**int** fact=1;

**for**(**int** i=2;i<=n;i++) {

fact\*=i;

}

**return** fact;

}

}

**public** **static** **void** main(String[] args) {

System.***out***.println(MathUtils.*Factorial*(5));

}

}

Q10.Create a base class Animal with attributes like name and species. Create a derived class Dog that inherits from Animal. Create objects of both Animal and Dog classes.

**package** project1;

**public** **class** Animal {

String name;

String species;

**void** printA() {

System.***out***.println("ANIMAL");

}

}

**class** Dog **extends** Animal{

**void** printD() {

System.***out***.println("DOG");

}

}

**class** Test {

**public** **static** **void** main(String[] args) {

Dog d1 = **new** Dog();

d1.printD();

d1.printA();

}

}