

Laboratory Work

Subject: Java Technologies

Branch: B.Tech. (CE)

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Student Roll No: CE001

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Question 1

Write a Java program that checks for prime number using the object oriented approach. [Hint: create a class NumberClass with a member value and method isPrimeNumber()]

Solution

```
import java.util.*;

class NumberClass {
    private int value ;
    private boolean[] isprime;

    NumberClass(int val)
    {
        this.value = val;
        this.isprime = new boolean[val + 1];
        for(int i = 0;i<=val;i++) isprime[i] = true;
    }

    boolean isPrimeNumber()
    {
        isprime[0] = isprime[1] = false;
        for(int i = 2;i<=value ; i++)
        {
            if(isprime[i])
            {
                for(int j = 2*i ; j<=value;j += i)
                {
```

```

        isprime[j] = false;
    }
}

return isprime[value];
}
}

class lab3_pg1 {

    public static void main(String[] args) {
        // TODO Auto-generated method stub
        Scanner obj = new Scanner(System.in);
        System.out.print("Enter number :- ");
        int n = obj.nextInt();
        NumberClass c1 = new NumberClass(n);

        if(c1.isPrimeNumber()) System.out.print("Number is
prime");
        else System.out.print("number is not prime ");

    }

}

```

Screenshot

```
"C:\Program Files\Eclipse Adoptium\jdk-17.0.8.101-hotspot
.jar=61880:C:\Users\LENOVO\AppData\Local\Programs\Intell
4\java\labs\java_labs\lab3\out\production\lab3" lab3_pg1
Enter number :- 51
number is not prime
Process finished with exit code 0
|
```

Question 2

Create two classes:

class Person

Derive a class Student from class Person.

Person

- name : String
- age : int
- + Person()
- + Person(name : String, age : int)
- + getName() : String
- + getAge() : int
- + setName(name : String) : void
- + setAge(age : int) : void
- + toString() : String

Student

- rollno : int
- marks : double[]
- + Student()
- + Student(rollno : int)
- + Student(rollno : int, marks : double[])

```
+ Student(rollno : int, name : String, age : int, marks :  
double[])  
+ getRollno() : int  
+ getMarks() : double[]  
+ setRollno(rollno: int) : void  
+ setMarks(marks : double[]) : void  
+ toString() : String  
+ displayDetails() : void
```

Add the following to Student class:

- a static variable count(to count the number of objects)
- a static block to initialize count variable to zero
- a static method String getCount() that returns the number of student objects created
- Write a TestStudent class containing the main() method.
- Store the details of 3 students by creating an array of objects of Student class and display the student who has highest average amongst the three students as follows using displayDetails() method for that object:

e.g.

RollNo = 100

Name = ABC

Age = 20

Marks=78 86 88 67 92

- Create one more object of the Student class and then call the getCount() to display the number of Student objects created.

Person class

```
public class Person {  
  
    private String name;  
    private int age;  
  
    public Person() {  
  
    }  
  
    ;  
  
    public Person(String name, int age) {  
        super();  
        this.name = name;  
        this.age = age;  
    }  
  
    public String getName() {  
        return name;  
    }  
  
    public void setName(String name) {  
        this.name = name;  
    }  
  
    public int getAge() {  
        return age;  
    }  
  
    public void setAge(int age) {  
        this.age = age;  
    }  
}
```

```
@Override
public String toString() {
    return "Person [name=" + name + ", age=" + age + "]\n";
}
}
```

Student Class

```
import java.util.Arrays;

class Student extends Person{
    private int rollno ;
    private double[] marks ;
    public static int count ;
    static {
        count = 0;
    }
    public Student() {
        super();
        count++;
    }
    public Student(int rollno, double[] marks) {
        super();
        this.rollno = rollno;
        this.marks = marks;
        count++;
    }
    @Override
    public String toString() {
```

```

        return "Student [rollno=" + rollno + ", marks=" +
Arrays.toString(marks) + "]";
    }
    public int getRollno() {
        return rollno;
    }
    public void setRollno(int rollno) {
        this.rollno = rollno;
    }
    public double[] getMarks() {
        return marks;
    }
    public void setMarks(double[] marks) {
        this.marks = marks;
    }
    public Student(String name, int age, int rollno, double[] marks)
{
    super(name, age);
    this.rollno = rollno;
    this.marks = marks;
    count++;
}

    void displayDetails()
    {
        System.out.println("RollNo = " + this.rollno + "\nName = "+
super.getName() + "\nAge = " + super.getAge() + "\nMarks = " +
Arrays.toString(this.marks));

    }
    static int getCount()
    {

```



```
        return count;
    }
}
```

TestClass

```
import java.util.Scanner;

public class lab3_pg2 {

    public static void main(String[] args) {
        Scanner obj = new Scanner(System.in);
        System.out.print("Enter the number :- ");
        int n = obj.nextInt();
        Student[] s = new Student[n];
        int index = 0;
        double highest = 0;

        for(int i = 0; i < n; i++)
        {
            obj.nextLine();
            System.out.print("Enter name :- ");
            String name = obj.nextLine();
            System.out.print("Enter age :- ");
            int age = obj.nextInt();
            System.out.print("Enter roll :- ");
            int roll = obj.nextInt();
            double[] marks = new double[5];
            double sum = 0;
            for(int j = 0; j < 5; j++)
            {
```

```
        System.out.print("Enter element marks of " + (j+1) + "
Subject :- " );
        marks[j] = obj.nextDouble();
        sum += marks[j];
    }
    s[i] = new Student(name,age,roll,marks);
    if(sum > highest)
    {
        highest = sum;
        index = i;
    }
}

s[index].displayDetails();
System.out.println(Student.getCount());

}
}
```

Screenshot

```
Enter the number :- 3
Enter name :- nisarg
Enter age :- 19
Enter roll :- 1
Enter element marks of 1 Subject :- 78
Enter element marks of 2 Subject :- 89
Enter element marks of 3 Subject :- 47
Enter element marks of 4 Subject :- 58
Enter element marks of 5 Subject :- 89
Enter name :- janmang
Enter age :- 19
Enter roll :- 5
Enter element marks of 1 Subject :- 56
Enter element marks of 2 Subject :- 78
Enter element marks of 3 Subject :- 98
Enter element marks of 4 Subject :- 78
Enter element marks of 5 Subject :- 85
Enter name :- neha
Enter age :- 19
Enter roll :- 36
Enter element marks of 1 Subject :- 89
Enter element marks of 2 Subject :- 87
Enter element marks of 3 Subject :- 45
Enter element marks of 4 Subject :- 58
Enter element marks of 5 Subject :- 47
RollNo = 5
Name = janmang
Age = 19
Marks = [56.0, 78.0, 98.0, 78.0, 85.0]
3
```