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BRANCH: CSCE
WT LAB: 06

Q1. Write a class file — box with three data members(length, width, height) and a method volume() . Also implement the application class Demo where an object of the box class is created with user entered dimensions and volume is printed.

```java
import java.util.*;
class box
{
    int length;
    int width;
    int height;
    void volume(int l,int w,int h)
    {
        length=l;
        width=w;
        height=h;

        int vol=length*width*height;
        System.out.println("Volume: "+vol);
    }
}
public class demo {
    Run | Debug
    public static void main(String args[])
    {
        Scanner sc=new Scanner(System.in);
        box b1=new box();
        int l,w,h;
        System.out.print("Enter length: ");
        l=sc.nextInt();
        System.out.print("Enter width: ");
        w=sc.nextInt();
        System.out.print("Enter height: ");
        h=sc.nextInt();
        b1.volume(l,w,h);
    }
}
```

Output:

```
PS C:\Users\KIIT\Desktop\college\WT CLASS\LAB-6> javac demo.java
PS C:\Users\KIIT\Desktop\college\WT CLASS\LAB-6> java demo
Enter length: 100
Enter width: 200
Enter height: 300
Volume: 6000000
```

Q2. Write a program to overload subtract method with various parameters in a class in Java

```java
public class lab6q2 {
    static void substract() {
        int a = 14, b = 18;
        System.out.println("Result with no parameters: " + (b - a));
    }
    static void substract(int a, int b) {
        System.out.println("Result with two parameters: " + (a-b));
    }
    static void substract(int a, int b, int c) {
        System.out.println("Result with three parameters: " + (c - (b - a)));
    }
    Run | Debug
    public static void main(String args[]) {
        substract();
        substract(20, 3);
        substract(10, 20, 22);
    }
}
```

Output:

```
PS C:\Users\KIIT\Desktop\college\WT CLASS\LAB-6> javac lab6q2.java
PS C:\Users\KIIT\Desktop\college\WT CLASS\LAB-6> java lab6q2
Result with no parameters: 4
Result with two parameters: 17
Result with three parameters: 12
```

Q3. Write a program which will overload the area() method and display the area of a circle, triangle and square as per user choice and user entered dimensions.

```java
import java.util.*;
public class lab6q3 {
    static void area(double rad)
    {
        double area=3.14*rad*rad;
        System.out.println("Area of circle: "+area);
    }

    static void area(int base,int h)
    {
        double area=0.5*base*h;
        System.out.println("Area of triangle: "+area);
    }
    static void area(int side)
    {
        int area=side*side;
        System.out.println("Area of square: "+area);
    }
```

```java
    public static void main(String args[])
    {
        Scanner sc=new Scanner(System.in);
        int ch;
        System.out.print("Press 1-for circle , 2-for triangle , 3-for square\nYour choice: ");
        ch=sc.nextInt();
        switch(ch)
        {
            case 1:double r;
                    System.out.print("Enter radius: ");
                    r=sc.nextDouble();
                    area(r);
                break;
            case 2:int b,h;
                    System.out.print("Enter the base: ");
                    b=sc.nextInt();
                    System.out.print("Enter the height: ");
                    h=sc.nextInt();
                    area(b,h);
                break;
            case 3:int side;
                    System.out.print("Enter the side: ");
                    side=sc.nextInt();
                    area(side);
                break;
            default: System.out.println("Wrong choice");
        }
    }
}
```

Output:

```
PS C:\Users\KIIT\Desktop\college\WT CLASS\LAB-6> javac lab6q3.java
PS C:\Users\KIIT\Desktop\college\WT CLASS\LAB-6> java lab6q3
Press 1-for circle , 2-for triangle , 3-for square
Your choice: 1
Enter radius: 20
Area of circle: 1256.0
PS C:\Users\KIIT\Desktop\college\WT CLASS\LAB-6> java lab6q3
Press 1-for circle , 2-for triangle , 3-for square
Your choice: 2
Enter the base: 10
Enter the height: 5
Area of triangle: 25.0
PS C:\Users\KIIT\Desktop\college\WT CLASS\LAB-6> java lab6q3
Press 1-for circle , 2-for triangle , 3-for square
Your choice: 3
Enter the side: 50
Area of square: 2500
```

Q4. Write a program in Java to define a class Rectangle having data member: length and breadth; to calculate the area and perimeter of the rectangle. Use member functions to read, calculate and display.

```java
import java.util.*;
class Rectangle {
    double length;
    double width;
    void Area()
    {
        double area;
        area = length * width;
        System.out.println("Area of rectangle is : " + area);
    }
    void Perimeter()
    {
        double perimeter;
        perimeter = 2 * (length + width);
        System.out.println("Perimeter of rectangle is : " + perimeter);
    }
}
class lab6q4 {
    Run | Debug
    public static void main (String[] args)
    {
        Rectangle rect = new Rectangle();
        rect.length = 15.854;
        rect.width = 22.65;
        System.out.println("Length = " + rect.length);
        System.out.println("Width = " + rect.width);
        rect.Area();
        rect.Perimeter();
    }
}
```

Output:

```
PS C:\Users\KIIT\Desktop\college\WT CLASS\LAB-6> javac lab6q4.java
PS C:\Users\KIIT\Desktop\college\WT CLASS\LAB-6> java lab6q4
Length = 15.854
Width = 22.65
Area of rectangle is : 359.09309999999994
Perimeter of rectangle is : 77.008
```

Q5. Write a program in java to input and display the details of n number of students having roll, name and CGPA as data members. Also display the name of the student having lowest CGPA.

```java
class Student
{
    int roll;
    String name;
    float cgpa;
    Student(int roll, String name, float cgpa)
    {
        this.roll = roll;
        this.name = name;
        this.cgpa = cgpa;
    }
}
class lab6q5{
    Run | Debug
    public static void main(String[] args)
    {
        int n;
        System.out.println("Enter the number of students:");
        n = Integer.parseInt(System.console().readLine());
        Student[] s = new Student[n];
        for(int i=0;i<n;i++)
        {
            System.out.println("Enter the details of student "+(i+1));
            System.out.println("Enter the roll number:");
            int roll = Integer.parseInt(System.console().readLine());
            System.out.println("Enter the name:");
            String name= System.console().readLine();
            System.out.println("Enter the cgpa:");
            float cgpa= Float.parseFloat(System.console().readLine());

            s[i] = new Student(roll, name, cgpa);
        }
        float min = s[0].cgpa;
        String name = s[0].name;
        for(int i=0;i<n;i++)
        {
            if(s[i].cgpa<min)
            {
                min = s[i].cgpa;
                name = s[i].name;
            }
        }
        System.out.println("The name of the student having lowest cgpa is "+name);
    }
}
```

Output:

Q6. Write a program to calculate area according to user input, whether it is circle, square or triangle (Menu Driven).

```java
import java.util.*;
public class lab6q6 {

    static void area(double rad)
    {
        double area=3.14*rad*rad;
        System.out.println("Area of circle: "+area);
    }

    static void area(int base,int h)
    {
        double area=0.5*base*h;
        System.out.println("Area of triangle: "+area);
    }

    static void area(int side)
    {
        int area=side*side;
        System.out.println("Area of square: "+area);
    }
    Run | Debug
    public static void main(String args[])
    {
        Scanner sc=new Scanner(System.in);
        int ch;
        System.out.print("Press 1-for circle , 2-for triangle , 3-for square\nYour choice: ");
        ch=sc.nextInt();
        switch(ch)
        {
```

```
29              case 1:double r;
30                      System.out.print("Enter radius: ");
31                      r=sc.nextDouble();
32                      area(r);
33                  break;
34              case 2:int b,h;
35                      System.out.print("Enter the base: ");
36                      b=sc.nextInt();
37                      System.out.print("Enter the height: ");
38                      h=sc.nextInt();
39                      area(b,h);
40                  break;
41              case 3:int side;
42                      System.out.print("Enter the side: ");
43                      side=sc.nextInt();
44                      area(side);
45                  break;
46              default: System.out.println("Wrong choice");
47          }
48      }
49  }
```

Output:

```
PS C:\Users\KIIT\Desktop\college\WT CLASS\LAB-6> javac lab6q6.java
PS C:\Users\KIIT\Desktop\college\WT CLASS\LAB-6> java lab6q6
Press 1-for circle , 2-for triangle , 3-for square
Your choice: 1
Enter radius: 21
Area of circle: 1384.74
PS C:\Users\KIIT\Desktop\college\WT CLASS\LAB-6> java lab6q6
Press 1-for circle , 2-for triangle , 3-for square
Your choice: 2
Enter the base: 22
Enter the height: 54
Area of triangle: 594.0
PS C:\Users\KIIT\Desktop\college\WT CLASS\LAB-6> java lab6q6
Press 1-for circle , 2-for triangle , 3-for square
Your choice: 3
Enter the side: 12
Area of square: 144
PS C:\Users\KIIT\Desktop\college\WT CLASS\LAB-6> java lab6q6
Press 1-for circle , 2-for triangle , 3-for square
Your choice: 5
Wrong choice
```

Q7. Write a program in Java to define a class Number with appropriate data members and member functions to input n number of integers and swap the biggest and smallest elements. Use member functions read(), swap() and display()

```java
class  NOS{
    int n;
    int arr[] = {0,0,0,0,0,0,0,0,0,0};
    void read(int [] a, int size){
        n = size;
        for(int i=0;i<n;i++){
            arr[i] = a[i];
        }
    }
    void display(){
        for(int i=0;i<n;i++){
            System.out.println(arr[i]+" ");
        }
    }
    void swap(){
        int max = -99999;
        int min = 99999;
        int cnt[] = {-1,-1};
        for(int i=0;i<n;i++){
            if(arr[i] > max){
                max = arr[i];
                cnt[0] = i;
            }
        }
        for(int i=0;i<n;i++){
            if(arr[i] < min){
                min = arr[i];
                cnt[1] = i;
            }
        }
        int temp = arr[cnt[0]];
        arr[cnt[0]] = arr[cnt[1]];
        arr[cnt[1]] = temp;
    }
}
public class lab6q7 {
    Run | Debug
    public static void main(String args[]){
        int nums[] = {1,2,3,4,5,6,7,8,9,10};
        int size = 10;
        NOS o1 = new NOS();
        o1.read(nums, size);
        System.out.println(" \n ");
        o1.display();
        o1.swap();
        System.out.println(" \n ");
        o1.display();
        System.out.println(" \n ");
    }
}
```

Output:

```
PS C:\Users\KIIT\Desktop\college\WT CLASS\LAB-6> javac lab6q7.java
PS C:\Users\KIIT\Desktop\college\WT CLASS\LAB-6> java lab6q7


1
2
3
4
5
6
7
8
9
10


10
2
3
4
5
6
7
8
9
1
```