JAVA CAT-2

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1.Write a java program, by creating a base class Number with a method calculate () to get the sum of the given digits. Derive the base class to a subclass Quadratic, to find the real and imaginary solutions for the given quadratic equation by overriding the method calculate (). Again derive the base class Number, to another subclass called Sos , to find the sum of square of the given number by overriding the method calculate().

Code:

```
import java.util.Scanner;
class Number{
   void calculate(int a, int b,int c){
      System.out.print("Sum is: ");
      System.out.println(a+b+c);
   }
}

class Quadratic extends Number{
   void calculate(int a, int b,int c){
      double disc,r1,r2;
      disc = Math.sqrt(b*b - 4*a*c);
      if(disc<0){
         System.out.println("Roots are imaginery");
      }
```

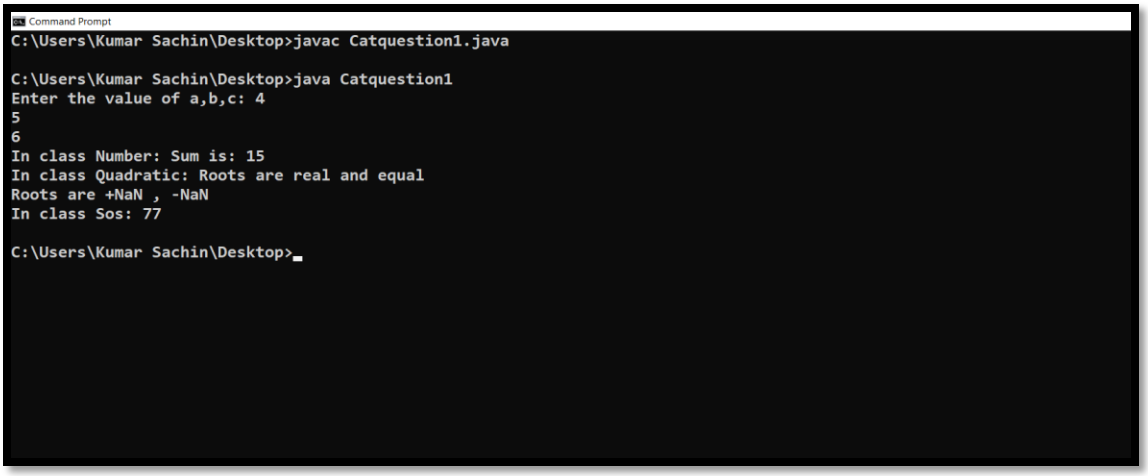
```
        else if(disc>0){
            System.out.println("Roots are real and unequal");
            r1= (-b + disc)/2*a;
            r2= (-b - disc)/2*a;
            System.out.println("Roots are "+ r1 +" , "+ r2);
        }
        else{
            System.out.println("Roots are real and equal");
            r1= (-b + disc)/2*a;
            System.out.println("Roots are "+ "+"+r1 +" , "+ "-"+r1);
        }
    }
}

class Sos extends Number{
    void calculate(int a, int b,int c){
        int sum = 0;
        sum += Math.pow(a, 2) + Math.pow(b, 2) + Math.pow(c, 2);
       System.out.println(sum);
    }
}

public class Catquestion1 {
    public static void main(String[] args){
```

```
        int a,b,c;
        System.out.print("Enter the value of a,b,c: ");
        Scanner sc = new Scanner(System.in);
        a = sc.nextInt();
        b = sc.nextInt();
        c = sc.nextInt();
        Number n = new Number();
        Quadratic q = new Quadratic();
        Sos s = new Sos();
        System.out.print("In class Number: ");
        n.calculate(a, b, c);
        System.out.print("In class Quadratic: ");
        q.calculate(a, b, c);
        System.out.print("In class Sos: ");
        s.calculate(a, b, c);
    }
}
```

Output:



2.Inside a package named p1, define a class 'Extract' with a method that will extract the digits of a number passed to it and store the extracted digits in an array. Create another package p2 inside p1 package and define two classes 'Sum' and 'SumOfSquares' in it. In the 'Sum' class include a method to find the sum of the elements of the array stored in 'Extract' class. In the 'SumOfSquares' class include a method to find the sum of the squares of the array elements. Now define the main class inside another package p3 which is a sub-package of p2. The main method should find the quotient after dividing the sum of squares of digits of the given number by sum of the digits.

Code:

extract.java

```
package p1;

public class extract {


   int r,t;
   public void extract(int n,int arr[]){
     while(n>0) {
        r = n % 10;
        for (int i = 0; i < arr.length; i++) {
           arr[i] = r;
```

```
        }
n=n/10;
     }

   }
}
```

sum.java

```
package p1.p2;

public class sum {
   public int sum(int arr[]) {
      int s = 0;
      for (int i = 0; i < arr.length;i++){
         s=s+arr[i];

      }
      return s;

   }
}
```

sumofsquare.java

```
package p1.p2;
public class sumofsquare {
   public int sum1(int arr[]) {
```

```
    int s = 0;
    for (int i = 0; i < arr.length;i++){
        s=s+(arr[i]*arr[i]);
    }
    return s;
}
}
```

Catquestion2.java

```
package p1.p2.p3;
import p1.extract;
import p1.p2.sum;
import p1.p2.sumofsquare;
import java.util.*;
public class Catquestion2 {
    public static void main(String[] args) {
        Scanner s = new Scanner(System.in);
        int n = s.nextInt();
        int arr1[] = new int[100];
        p1.extract e = new extract();
        e.extract(n, arr1);
        p1.p2.sum as = new sum();
        int m = as.sum(arr1);
        p1.p2.sumofsquare pas = new sumofsquare();
```

```
        int b = pas.sum1(arr1);
        float nj = m / b;
        System.out.println(nj);
    }
}
```