



6. Joey needs to write a program that takes an int and the no of bits N as input & outputs the value of the lowest N bits of the int

Soln:-

```
import java.util.Scanner;
```

```
class Joey {
```

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

```
        Scanner s = new Scanner (System.in);
```

```
        int a = s.nextInt ();
```

```
        int b = s.nextInt ();
```

```
        int c = (1 << b) - 1;
```

```
        int d = a & c;
```

```
        System.out.println ("Result: " + d);
```

```
    }
```

```
}
```

7. Miles is analyzing two integers. He wants to check if either one of the integers is both:

1. less than or equal to zero
2. Odd.

Soln:

```
import java.util.Scanner;
```

```
class miles {
```

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

```
        Scanner s = new Scanner (System.in);
```

```
        int a = s.nextInt ();
```

```
        int b = s.nextInt ();
```

```
        if ((a <= 0 && Math.abs(a < 2) == 1) || (b <= 0 &&
```

```
            Math.abs(b < 2) == 1)) {
```

```
            System.out.println ("true");
```

```
        }
```

```
        else {
```

```
            System.out.println ("false");
```

```
        }
```

```
    }
```

```
}
```

8. The kingdom of finance, if the avg daily expense is greater than two of the categories, you need to calculate the avg of the three expenses & check if it is greater than any two categories.

Soln:

```
import java.util.Scanner;
```

```
class rle {
```

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

```
        Scanner s = new Scanner (System.in);
```

```
        int a = s.nextInt ();
```

```
        int b = s.nextInt ();
```

```
        int c = s.nextInt ();
```

```
        double avg = (a + b + c) / 3.0;
```



```

else {
    System.out.println("The integer closer to 100 is"
        + b + "with a difference of " + d);
}
}
}

```

- d. Dave got two students. Each hands out an int & wants to find if one int +ve while the other is not divisible by 3.

Soln:

```

import java.util.Scanner;
class Dave {
    public static void main (String[] args) {
        Scanner s = new Scanner(System.in);
        int a = s.nextInt();
        int b = s.nextInt();
        if (a > 0) {
            if (b % 3 != 0) {
                System.out.println("One of the integers is
                    positive while the other is not divisible by 3.");
            }
            else {
                if (b > 0) {
                    if (a % 3 != 0) {
                        System.out.println("One of the integers
                            is positive while the other is not
                            divisible by 3.");
                    }
                }
            }
        }
    }
}

```

```

}
else {
    System.out.println("Neither of the integers
        meets the condition.");
}
}
else {
    System.out.println("Neither of the integers
        meets the condition.");
}
}
}
else {
    if (b > 0) {
        if (a % 3 != 0) {
            System.out.println("One of the integers is
                positive while the other is not divisible
                by 3.");
        }
        else {
            System.out.println("Neither of the integers
                meets the condition.");
        }
    }
    else {
        System.out.println("Neither of the integers meets
            the condition.");
    }
}
}
}
}

```

```
System.out.println("% . 2+1n", avg);
```

```
if (a > b && a > c) {
```

```
    s1 = b;
```

```
    s2 = c;
```

```
}
```

```
else if (b > a && b > c) {
```

```
    s1 = a;
```

```
    s2 = c;
```

```
}
```

```
else {
```

```
    s1 = a;
```

```
    s2 = b;
```

```
}
```

```
if (avg > s1 && avg > s2) {
```

```
    System.out.println("Average is greater  
than both " + s1 + " and " + s2);
```

```
}
```

```
else {
```

```
    System.out.println("Average is not greater  
than two smallest expenses");
```

```
}
```

```
}
```

```
}
```

9. Phil needs to verify if a number reading at a mid station (s2) falls exactly halfway b/w the reading of the prev station (s1) & the next station (s3).

Soln:

```
import java.util.Scanner;
```

```
class Phil {
```

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

```
        Scanner s = new Scanner (System.in);
```

```
        int s1 = s.nextInt();
```

```
        int s2 = s.nextInt();
```

```
        int s3 = s.nextInt();
```

```
        boolean mid = s2 == (s1 + s3) / 2;
```

```
        System.out.println (mid);
```

```
        if (mid) {
```

```
            System.out.println ("The second Integer is  
halfway b/w the between the first and third  
Integers.");
```

```
}
```

```
else {
```

```
    System.out.println ("The second Integer is  
not halfway between the first and third  
Integers.");
```

```
}
```

```
}
```

```
}
```



3. Manoj needs to create a program that takes an int input, converts it into a double, & display both the original int, and the converted double value.

Soln:-

```
import java.util. Scanner;
```

```
class manoj {
```

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

```
        Scanner s = new Scanner (System.in);
```

```
        int a = s. nextInt();
```

```
        System.out. println("Original Integer: " + a);
```

```
        System.out. println("Converted Double: " + (double)a);
```

```
    }
```

```
}
```

4. Vishal gives Arun two int. He asks Arun to check if the sum of these two numbers is a multiple of their product.

Soln:

```
import java. util. Scanner;
```

```
class vishal {
```

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

```
        Scanner s = new Scanner (System.in);
```

```
        int a = s. nextInt();
```

```
        int b = s. nextInt();
```

```
        int c = a+b;
```

```
        int d = a*b;
```

```
        if (c*d == 0) {
```

```
            System.out. println("Sum is Multiple of Product");
```

```
        }
```

```
    }
```

```
    System.out. println("Sum is Not Multiple of Product");
```

```
}
```

```
}
```

5. Emily has a beautiful circular garden in her backyard. To calculate the circumference and area,

$$C = 2 * \pi * r$$

$$A = \pi * r^2$$

Soln:

```
import java. util. Scanner;
```

```
class emily {
```

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

```
        Scanner s = new Scanner (System.in);
```

```
        double r = s. nextDouble();
```

```
        double c = 2 * 3.14159 * r;
```

```
        double a = 3.14159 * r * r;
```

```
        System.out. println("Circumference: %.2f meters\n", c);
```

```
        System.out. println("Area: %.2f square meters", a);
```

```
    }
```

```
}
```

```

class xam {
    public static void main(String[] args) {
        Scanner s = new Scanner(System.in);
        int n = s.nextInt();
        if ((n % 5 == 0) && (n % 7 != 0)) {
            System.out.println(n + " is a multiple of 5");
        }
        else if ((n % 5 != 0) && (n % 7 == 0)) {
            System.out.println(n + " is a multiple of 7");
        }
        else if ((n % 5 != 0) && (n % 7 != 0)) {
            System.out.println(n + " is neither multiple  
of 5 nor 7");
        }
    }
}

```

3. John wants to use BMI calculator to assess the body mass index of his clients

- i)  $BMI < 18.5$  - Underweight
- ii)  $BMI \geq 18.5$  &  $BMI < 24.9$  - Normal weight
- iii)  $BMI \geq 25.0$  &  $BMI < 29.9$  - Overweight
- iv)  $BMI \geq 30.0$  - Obese.

Soln:  
import java.util.Scanner;

```

class John {
    public static void main(String[] args) {
        Scanner s = new Scanner(System.in);

```

```

        double h = s.nextDouble();
        double w = s.nextDouble();
        double bmi = w / (h * h);
        System.out.println("BMI: " + 2 * n, "bmi");
        if (bmi < 18.5)
            System.out.println("Classification: Underweight");
        else if ((bmi >= 18.5) && (bmi < 24.9))
            System.out.println("Classification: Normal weight");
        else if ((bmi >= 25.0) && (bmi < 29.9))
            System.out.println("Classification: Overweight");
        else if (bmi >= 30.0)
            System.out.println("Classification: Obese");
    }
}

```

4. Arpit wants to evaluate the depreciation of his car over time to understand its current value and categorize it based on that value.

- i) High : current value  $> 10,000$
- ii) Medium: current value is b/w 5,000 & 10,000
- iii) Low : current value  $< 5000$

Soln:

```

import java.util.Scanner;

```



6. Maya, wants to create a pattern using stars (\*) in a specific format.

Soln:

import java.util.Scanner;

class maya {

public static void main(String[] args) {

Scanner s = new Scanner(System.in);

int n = s.nextInt();

for (int i = 1; i <= n; i++) {

for (int j = 1; j <= i; j++) {

System.out.print("\* ");

System.out.println();

for (int i = n - 1; i >= 1; i--) {

for (int j = 1; j <= i; j++) {

System.out.print("\* ");

System.out.println();

}

}

}

7. You are given a numerical pyramid pattern. The enhancing pattern is followed using a for loop and is controlled based on user input.

Soln:

import java.util.Scanner;

class num {

public static void main(String[] args) {

Scanner s = new Scanner(System.in);

int n = s.nextInt();

for (int i = 1; i <= n; i++) {

for (int j = 1; j <= n - i + 1; j++) {

System.out.print(" ");

for (int k = 1; k <= (2 \* i - 1); k++) {

System.out.print(k);

System.out.println();

}

}

```

class anit {
    public static void main (String[] args) {
        Scanner s = new Scanner (System.in);
        int a = s.nextInt();
        int b = s.nextInt();
        double c = 0.15;
        double d = a;
        for (int i = 0; i < b; i++) {
            d = d * c;
        }
        System.out.println ("Current Value : %.2f\n", d);
        if (d > 10000) {
            System.out.println ("category: High");
        }
        else if ((d > 5000) && (d < 10000)) {
            System.out.println ("category: Medium");
        }
        else if (d < 5000) {
            System.out.println ("category: Low");
        }
    }
}

```

5. Ted, has accepted the challenge of writing a program that checks if the number of digits in an integer matches the sum of its digits.

Input java.util.Scanner;

class Ted {

public static void main (String[] args) {

Scanner s = new Scanner (System.in);

int n = s.nextInt();

int temp = n;

int sum = 0;

int count = 0;

do {

int a = temp % 10;

sum = sum + a;

count ++;

temp = temp / 10;

} while (temp > 0);

if (sum == count) {

System.out.println ("The number of digits in " +  
n + " matches the sum of its digits.");

} else {

System.out.println ("The number of digits in " +  
n + " does not matches the sum of its digits.");

}

}



10. Ashu knows how many days the each worker would take the time to complete.

Soln:

```
import java.util. Scanner;
```

```
class Ashu {
```

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

```
        Scanner s = new Scanner(System.in);
```

```
        int x = s.nextInt();
```

```
        int y = s.nextInt();
```

```
        int z = s.nextInt();
```

```
        int d1 = s.nextInt();
```

```
        int d2 = s.nextInt();
```

```
        double a = 1.0/x;
```

```
        double b = 1.0/y;
```

```
        double c = 1.0/z;
```

```
        double w1 = (a+b+c)*d1;
```

```
        double w2 = (a+b)*d2;
```

```
        double rem = 1.0 - (d1+d2);
```

```
        System.out.println("Work done in first d1 days
```

```
        (A+B+C): %.2f \n", w1);
```

```
        System.out.println("Work done in next d2 days
```

```
        (A+B): %.2f \n", w2);
```

```
        System.out.println("Remaining work : %.2f", rem);
```

```
    }
```

```
}
```

11. Anu is working on a project to automate the process of determining whether a student has passed or failed based on their subject marks.

Soln:

```
import java.util. Scanner;
```

```
class Student {
```

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

```
        Scanner s = new Scanner(System.in)
```

```
        int a = s.nextInt();
```

```
        int b = s.nextInt();
```

```
        int c = s.nextInt();
```

```
        int d = s.nextInt();
```

```
        int e = s.nextInt();
```

```
        int f = (a+b+c+d+e)/5;
```

```
        System.out.println("Average score: "+f);
```

```
        if (f >= 50) {
```

```
            System.out.println("The student has passed");
```

```
        }
```

```
        else {
```

```
            System.out.println("The student has failed");
```

```
        }
```

```
    }
```

```
}
```

12. Samantha, Her teacher gives her an problem to solve, which takes a no as input & checks whether it is a multiple of 5 or 7.

Soln:

```
import java.util. Scanner;
```

```

int[] a = new int[n];
for (int i=0; i<n; i++){
    a[i] = s.nextInt();
}
int sum = 0;
for (int i=0; i<n; i++){
    sum = a[0] + a[n-1];
}
System.out.println("Sum of the first and last
elements: " + sum);
}

```

4. Lesha ~~ex~~ wants to add temp data from two diff weather stations

Soln:

Import java.util.\*;

class Lesha {

public static void main (String[] args) {

Scanner s = new Scanner (System.in);

int n = s.nextInt();

int m = s.nextInt();

int[][] a = new int [n][m];

int[][] b = new int [n][m];

for (int i=0; i<n; i++){

for (int j=0; j<m; j++){  
 a[i][j] = s.nextInt();  
}

}  
for (int i=0; i<n; i++){  
for (int j=0; j<m; j++){  
 b[i][j] = s.nextInt();  
}

}  
for (int i=0; i<n; i++){  
for (int j=0; j<m; j++){  
 System.out.printf("%d ", a[i][j] + b[i][j]);  
}
System.out.printf("\n");  
}

5. Sharon wants to find the first repeated element in an array.

Soln:

Import java.util.\*;

class Sharon {

public static void main (String[] args) {

Scanner s = new Scanner (System.in);

int n = s.nextInt();



1. Rosh wants to compute the sum of the third largest and second-smallest elements from a list of integers.

Soln:

```
import java.util.*;
```

```
class Rosh {
```

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

```
        Scanner s = new Scanner (System.in);
```

```
        int n = s.nextInt ();
```

```
        int [] a = new int [n];
```

```
        for (int i=0; i<n; i++) {
```

```
            a[i] = s.nextInt ();
```

```
        }
```

```
        Arrays.sort (a);
```

```
        int sum = a[1] + a[n-3];
```

```
        System.out.println (sum);
```

```
    }
```

```
}
```

2. Monica wants sum of main diagonal ele and secondary diagonal elements.

Soln:

```
import java.util.*;
```

```
class Monica {
```

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

```
        Scanner s = new Scanner (System.in);
```

```
        int n = s.nextInt ();
```

```
int [][] a = new int[n][n];
```

```
for (int i=0; i<n; i++) {
```

```
    for (int j=0; j<n; j++) {
```

```
        a[i][j] = s.nextInt ();
```

```
    }
```

```
}
```

```
int sum=0, dsum=0;
```

```
for (int i=0; i<n; i++) {
```

```
    sum = sum + a[i][i];
```

```
    dsum += a[i][n-i-1];
```

```
}
```

```
System.out.println ("sum of the main diagonal: " + sum);
```

```
System.out.println ("sum of the secondary diagonal " + dsum);
```

```
}
```

```
}
```

3. Task: sum of the weights of 1<sup>st</sup> & last packages in the list.

Soln:

```
import java.util.*;
```

```
class Wase {
```

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

```
        Scanner s = new Scanner (System.in);
```

```
        int n = s.nextInt ();
```

### Week 5

1. Each customer booking has a Booking ID (Integer)
- \* customer name (String)
  - \* distance travelled in km

The fare calculation rules are \*

- Base fare = 50 units

- \* Per km charge = 10 units/km

- \* If distance  $> 20$ , 10% discount is applied on total fare.

soln:

```
import java.util.*;
```

```
class citybank {
```

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

```
        Scanner s = new Scanner (System.in);
```

```
        int n = s.nextInt();
```

```
        s.nextLine();
```

```
        for (int i = 0; i < n; i++) {
```

```
            int an = s.nextInt();
```

```
            s.nextLine();
```

```
            String cn = s.nextLine();
```

```
            double kb = s.nextDouble();
```

```
            double da = s.nextDouble();
```

```
            double ws = s.nextDouble();
```

```
            kb += da;
```

```
            System.out.println ("Account Number: " + an);
```

```
            System.out.println ("Customer Name: " + cn);
```

```
        } (kb < ws) {
```

```
            System.out.println ("Total Balance: " + kb);
```

```
        } else {
```

```
            kb = ws;
```

```
            System.out.println ("Final Balance: " + kb);
```

```
        }
```

```
    }
```

```
}
```

```
}
```

2. Each stu enrollment has \*
- \* An enrollment ID (Int)

- \* A stu name (String)

- \* The no of sub (Int)

In fee calculation rules are:

- \* Reg fee = 1000 units

- \* Per sub fee = 800 units

- \* If stu enrolls in more than 1 sub, 20% scholarship is applied.

soln:

```
import java.util.*;
```

```
class enroll {
```

```
    private int enrollId;
```

```
    private String stuName;
```

```
    private int sub;
```

```
    private double fee;
```

```
    public Enroll (int enrollId, String stuName, int sub) {
```

```
        this.enrollId = enrollId;
```



```

else {
    for (int j=0; j < d.length(); j++) {
        char ch = d.charAt(j);
        if ( (ch > 'a') & ch <= 'z' ) || (ch >= 'A' &
            ch <= 'Z' ) ) {
            e = false;
            break;
        }
    }
}

```

3  
 3  
 3  
 1013  
 c. append(d) - append(" ");

```

    }
    if (c.length() > 0) {
        System.out.println(c.toString().trim());
    }
    else {
        System.out.println("No valid words.");
    }
}

```

5. PIN code 1. exactly 4 digits 2. numeric (0-9)  
3. identical digits X.

Soln:

```
import java.util.*;
```

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

```
Scanner s = new Scanner(System.in);
```

```
int n = Integer.parseInt(s.nextLine());
```

for (Pw i = 0; i < n; i++)

```
String a = s.nextLine();
```

if (a.length() == 4 & & a.matches("ld{4}"))

$$1) \quad (a, \text{charAt}(0)) = (a, \text{charAt}(1)) \text{ et } a, \text{charAt}(1) =$$
$$a.charAt(2) \text{ or } a.charAt(2) == a.charAt(1)) \}$$

system.out.println("YES");

3  
the {

```
System.out.println("NO");
```

2

2. Write a program that accepts at least five keywords as input arguments & outputs them in sorted alphabetical order.

Soln:

```
import java.util.*;
```

```
class anu {
    public static void main(String[] args) {
        Scanner s = new Scanner(System.in);
        int n = Integer.parseInt(s.nextLine());
        String[] a = s.nextLine().split(" ");
        Arrays.sort(a);
        for (int i = 0; i < n; i++) {
            System.out.println("%s ", a[i]);
        }
    }
}
```

3. Bechan chacha is seeking for a valid mobile no.
- \* exactly 10 digits
  - \* numeric values (0-9)
  - \* does not begin with 0.

Soln:

```
import java.util.*;
```

```
class bechan {
    public static void main(String[] args) {
        Scanner s = new Scanner(System.in);
        int n = Integer.parseInt(s.nextLine());
        for (int i = 0; i < n; i++) {
```

```
String a = s.nextLine().trim();
```

```
if (a.length() == 10 && a.matches("\\d{10}")) &&
```

```
a.charAt(0) != '0') {
```

```
    System.out.println("YES");
```

```
    }
    else {
```

```
        System.out.println("NO");
```

```
    }
```

```
}
```

```
}
```

```
}
```

4. Anju wants to identify valid words in a sentence.

Soln:

```
import java.util.*;
```

```
class anju {
```

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

```
        Scanner s = new Scanner(System.in);
```

```
        String a = s.nextLine().trim();
```

```
        String[] b = a.split(" ");
```

```
        StringBuilder c = new StringBuilder();
```

```
        for (int i = 0; i < b.length; i++) {
```

```
            String d = b[i];
```

```
            boolean boolean e = true;
```

```
            if (d.length() < 2) {
```

```
                e = false;
```

```
            }
```



3. Neka
- \* Customer ID (int)
  - \* Customer Name (String)
  - \* Units consumed (double)

Soln:

```
import java.util.*;
```

```
class Neka {
```

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

```
        Scanner s = new Scanner (System.in);
```

```
        int n = s.nextInt();
```

```
        s.nextLine();
```

```
        for (int i = 0; i < n; i++) {
```

```
            int ci = s.nextInt();
```

```
            s.nextLine();
```

```
            String cn = s.nextLine();
```

```
            double un = s.nextDouble();
```

```
            System.out.println ("Customer ID: " + ci);
```

```
            System.out.println ("Customer Name: " + cn);
```

```
            if (un <= 100) {
```

```
                un * 5;
```

```
            }
```

```
            else if (un > 100 & un <= 200) {
```

```
                un = 100 * 5 + (un - 100) * 7;
```

```
            } else {
```

```
                un = (100 * 5) + (100 * 7) + (un - 200) * 9;
```

```
            }
```

```
        if (un > 200) {
```

```
            un = un - (un * 0.05);
```

```
        }
```

```
        System.out.printf ("Final Bill: %.1f", un);
```

```
    }
```

```
}
```

## Week 6

1. Elsa subscribes to a premium service with a base monthly cost, a service tax and an extra feature cost. Assist her in writing an inheritance program that takes input for these values & calculates the total monthly cost.

Sample test case:

Input :

10.0

2.5

5.0

Output :

Rs. 17.50

⇒ Input java.util.Scanner;

class Subscription {

protected double baseMonthlyCost;

public Subscription(double baseMonthlyCost) {

this.baseMonthlyCost = baseMonthlyCost;

}

}

class PremiumSubscription extends Subscription {

private double serviceTax;

private double extraFeatureCost;

public PremiumSubscription(double baseMonthlyCost,

double serviceTax, double extraFeatureCost) {

super(baseMonthlyCost);

this.serviceTax = serviceTax;

this.extraFeatureCost = extraFeatureCost;

}

```
public double calculateMonthlyCost() {  
    return baseMonthlyCost + serviceTax + extra  
        FeatureCost;  
}
```

}

}

public class Main {

public static void main(String[] args) {

Scanner scanner = new Scanner(System.in);

double baseMonthlyCost = scanner.nextDouble();

double serviceTax = scanner.nextDouble();

double extraFeatureCost = scanner.nextDouble();

PremiumSubscription premiumSubscription = new

PremiumSubscription(baseMonthlyCost, serviceTax,

extraFeatureCost);

double totalMonthlyCost = premiumSubscription.

calculateMonthlyCost();

System.out.printf("Rs. %.2f %n", totalMonthlyCost);

}

}



```

this.stuName = stuName;
this.sub = sub;
calculateFee();
}

public void setEnrollId (int enrollId){
    this.enrollId = enrollId;
}

public void setStuName (String stuName){
    this.stuName = stuName;
}

public void setSub (int sub){
    this.sub = sub;
    calculateFee();
}

public int getEnrollId(){
    return enrollId;
}

public String getStuName(){
    return stuName;
}

public int getSub(){
    return sub;
}

public double getFee(){
    return fee;
}
}

```

```

private void calculateFee() {
    fee = 1000 + sub * 200;
    if (sub > 5) {
        fee = fee - (fee * 0.2);
    }
}

}

class nam {
    public static void main (String[] args) {
        Scanner s = new Scanner (System.in);
        int n = Integer.parseInt (s.nextLine());
        for (int i = 0; i < n; i++) {
            int id = Integer.parseInt (s.nextLine());
            String name = s.nextLine();
            int sub = Integer.parseInt (s.nextLine());
            Enroll enroll = new Enroll (id, name, sub);
            System.out.println ("Enrollment ID: " + enroll.getId());
            System.out.println ("Student Name: " + enroll.getName());
            System.out.println ("Final Fee: %.1f\n", enroll.getFee());
        }
    }
}

```

3. Meethi is working on a project to automate sales tax calculations for items in a store. She wants to create a program that takes the price of an item & the sales tax rate as input & calculates the final price of the item after applying the sales tax.

Formula used:  $\text{Final price} = \text{price} + (\text{price} * \text{sales tax rate}) / 100$

⇒ Import java.util.Scanner;

class SalesTaxCalculator {

public static int calculateFinalPrice (int price, int taxRate) {

return price + (price \* taxRate / 100);

}

public static double calculateFinalPrice (double price, double taxRate) {

return price + (price \* taxRate / 100);

}

}

class Main {

public static void main (String[] args) {

Scanner scanner = new Scanner (System.in);

int intPrice = scanner.nextInt();

int intTaxRate = scanner.nextInt();

double doublePrice = scanner.nextDouble();

double doubleTaxRate = scanner.nextDouble();

int finalPriceInt = SalesTaxCalculator.calculateFinalPrice (intPrice, intTaxRate);

double finalPriceDouble = SalesTaxCalculator.

calculateFinalPrice (doublePrice, doubleTaxRate);

System.out.println (finalPriceInt);

System.out.printf ("%1.2f", finalPriceDouble);

}

}

4. Mr. Kapoor wants to create a program to calculate the volume of a cuboid & cube using method overloading. Sample test case:

Input 1:

60.0 60.0 60.0

50.0

Output 1:

Volume of cuboid: 216000.00

Volume of cube: 125000.00

⇒ Import java.util.Scanner;

class Cuboid {

protected double length;

protected double width;

protected double height;

public Cuboid (double length, double width, double height) {

this.length = length;



```

        this.width = width;
        this.height = height;
    }
    public double calculateVolume() {
        return length * width * height;
    }
}

class cube extends cuboid {
    public cube(double side) {
        super(side, side, side);
    }
    public double calculateVolume() {
        return length * length * length;
    }
}

public class Main {
    public static void main (String[] args) {
        Scanner scanner = new Scanner (System.in);
        double cuboidLength = scanner.nextDouble();
        double cuboidWidth = scanner.nextDouble();
        double cuboidHeight = scanner.nextDouble();
        cuboid cuboid = new cuboid (cuboidLength, cuboidWidth,
                                    cuboidHeight);
    }
}

```

```

System.out.printf ("Volume of cuboid: %.2f\n",
                    cuboid.calculateVolume());
double cubeSide = scanner.nextDouble();
Cuboid cube = new Cube (cubeSide);
System.out.printf ("Volume of cube: %.2f", cube.
                    calculateVolume());
}
}

```

2. Alice is managing an online store & wants to implement a program using inheritance to calculate the selling price of products after applying discount.  
Guide her by following the instructions.

1. Create a base class called Product with a public double attribute price.

2. Create a subclass called DiscountedProduct, which extends Product & includes a private double attribute discount rate. This subclass has a method called calculateSellingPrice() to determine the final selling price after applying the discount.

Formula: Discounted selling price = price \* (1 - discount rate)

Sample test cases:

Input 1:

50.00

0.20

Output 1:

Rs. 40.00

→ Import java.util.Scanner;

class Product {

public double initialPrice;

public Product (double initialPrice) {

this.initialPrice = initialPrice;

}

}

class DiscountedProduct extends Product {  
private double discountRate;  
public DiscountedProduct (double initialPrice, double

discountRate) {  
super (initialPrice);

this.discountRate = discountRate;

3  
public double calculateSellingPrice() {

return initialPrice \* (1 - discountRate);

}

3  
class ProductPricing {

public static void main (String[] args) {

Scanner scanner = new Scanner (System.in);

double initialPrice = scanner.nextDouble();

double discountRate = scanner.nextDouble();

DiscountedProduct discountedProduct = new  
DiscountedProduct (initialPrice, discountRate);

double sellingPrice = discountedProduct.calculateSellingPrice();

If (sellingPrice > 0) {

System.out.printf("Rs. %.2f", sellingPrice);

} else {

System.out.println("Not applicable");

}

}



```

int[] a = new int[n];
for (int i = 0; i < n; i++) {
    a[i] = s.nextInt();
}
HashSet<Integer> set = new HashSet<>();
boolean d = false;
for (int i = 0; i < n; i++) {
    if (!set.add(a[i])) {
        d = true;
        System.out.println(a[i]);
        break;
    }
}
if (!d) {
    System.out.println("No repeated element found  
in the array");
}
}

```

1. punctuation marks of Interest are 1 comma (,) 2 periods (.)  
3. Question marks (?)

Soln:

```

import java.util.*;
class Solution {
    public static void main(String[] args) {
        Scanner s = new Scanner(System.in);
        int n = Integer.parseInt(s.nextLine());
        for (int i = 0; i < n; i++) {
            String a = s.nextLine();
            int c = 0;
            int p = 0;
            int q = 0;
            for (int j = 0; j < a.length(); j++) {
                char ch = a.charAt(j);
                if (ch == ',') c++;
                else if (ch == '.') p++;
                else if (ch == '?') q++;
            }
            System.out.println(c + " " + p + " " + q);
        }
    }
}

```