

MCQ.

1. `import java.util.*;`

`class relational {`

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

`{`

`int x = 8, y = 4;`

`boolean result = (x != y);`

`}`

`System.out.println(result);`

Answer: True

2. `import java.util.*;`

`class Ternary {`

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

`{`

`int a = 15, b = 10;`

`int result = (a > b) ? a : b;`

`}`

`System.out.println(result);`

Answer: 10

3. `class Testcase {`

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

`{`

`int a = 5;`

`int b = 10;`

`int bitwiseAnd = a & b;`

`int bitwise OR = a | b;`

`System.out.println(sum);`

`System.out.println(bitwise And);`

`System.out.println(bitwise OR);`

`}`

Answer: 15 10 3 15

90

4. Which of the following data types is used to store floating point numbers with greater precision?

Answer: float

5. `import java.util.*;`

`class complex {`

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

`{`

`int a = 5, b = 2, c = 3, d = 4;`

`int result = a + b * c / d - b;`

`}`

`System.out.println(result);`

Answer: 50

6. Class Division ?

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

`{`

`double num1 = 10.5;`

`double num2 = 3;`

`int result = (int)(num1 / num2);`

`System.out.println(result);`

Answer: 3

7. class Demo?

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

`{`

`String text = "Hello, World";`

`System.out.println(text);`

Answer: 2

Answer: 1

Answer: 2

Answer: 3

Answer: 4

Answer: 5

Answer: 6

Answer: 7

Answer: 8

Answer: 9

Answer: 10

Answer: 11

Answer: 12

Answer: 13

Answer: 14

Answer: 15

Answer: 16

Answer: 17

Answer: 18

Answer: 19

Answer: 20

Answer: 21

Answer: 22

Answer: 23

① import java.io.*;
 import java.util.Scanner;
 class Difference
 {
 public static void main (String args[])
 {
 Scanner sc = new Scanner(System.in);
 int a = sc.nextInt();
 int b = sc.nextInt();
 int c = Math.abs(100-a);
 int d = Math.abs(100-b);
 if (c < d)
 System.out.println("The integer closer to 100 is " + a + " with difference of " + (c-d));
 else
 System.out.println("The integer closer to 100 is " + b + " with difference of " + (d-c));
 }
 }

I/P - 90
 80
 O/P The integer closer to 100 is 90 with difference 10
 Explanation: $100 - 90 = 10$
 $100 - 80 = 20$
 10 is closer.

② import java.io.*;
 import java.util.Scanner;
 class Program
 {
 public static void main (String args[])
 {
 Scanner sc = new Scanner (System.in);
 int a = sc.nextInt();
 int b = sc.nextInt();
 if (a%3 == 0 || b%3 == 0) || (a%3 != 0 && b%3 != 0)
 System.out.println("One of the integers is divisible by 3");
 else
 System.out.println("Neither of the integers meets the condition");
 }
 }

I/P - 4
 3
 O/P One of the integers is positive while the other is not divisible by 3.
 (4%3 == 0) true
 (3%3 == 0) false
 ((4%3 != 0) && (3%3 != 0)) false

③ import java.io.*;
 import java.util.Scanner;
 class Main
 {
 public static void main (String args[])
 {
 Scanner sc = new Scanner (System.in);
 int a = sc.nextInt();
 System.out.println(a);
 System.out.println((double)a);
 }
 }

I/P - 20
 O/P Original = 20
 Double value = 20.0

④ Import java.io.*;
 Import java.util.Scanner;
 class Main
 { public static void main(String args[]){
 Scanner sc = new Scanner(System.in);
 int a = sc.nextInt();
 int b = sc.nextInt();
 if ((a+b)%(a*b)==0)
 System.out.println("Sum is Multiple of Product");
 else
 System.out.println("Sum is not Multiple of product");
 } }

I/P 1 2
 O/P Sum is not multiple
 of Product.

$$\begin{array}{r} a+b \\ a \times b \\ \hline 3 \quad 2 \end{array}$$

⑤ Import java.io.*;
 Import java.util.Scanner;
 class Main
 { public static void main(String args[]){
 Scanner sc = new Scanner(System.in);
 double a = sc.nextDouble();
 double PI = 3.14159;
 System.out.printf("Circumference : %.2f meters\n", 2*PI*a);
 System.out.printf("Area : %.2f Square meters\n", PI*a*a);
 } }

I/P - 3.0
 O/P - Circumference 18.85m
 Area 28.27 sq

⑥ Import java.io.*;
 Import java.util.Scanner;
 class Main
 { public static void main(String args[]){
 Scanner sc = new Scanner(System.in);
 int x = sc.nextInt();
 int y = sc.nextInt();
 System.out.println("Result : "+(x & (1<<y-1)));
 } }

I/P = -45
 -45 is odd
 10
 So true

⑦ Import java.io.*;
 Import java.util.Scanner;
 class Main
 { public static void main(String args[]){
 } }

O/P - True

```

    int x = sc.nextInt();
    int y = sc.nextInt();
    System.out.println((x <= 0) && (x >= -5) || (y <= 0) && (y >= -5));

```

8) import java.io.*;

import java.util. Scanner;

class Main

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

{ Scanner sc = new Scanner (System.in);

int a = sc.nextInt();

int b = sc.nextInt();

int c = sc.nextInt();

double avg = (double)(a+b+c)/3;

System.out.println("Y. d. 2f\n", avg);

System.out.println((avg >= a && avg >= b) ? "Average is greater than both " + a + " and " + b : (avg >= a && avg >= c) ? "Average is greater than both " + a + " and " + c : (avg >= b && avg >= c) ? "Average is greater than both " + b + " and " + c : "Average is not greater than two smallest");

}

}

9)

import java.io.*;

import java.util. Scanner;

class Main

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

{ Scanner sc = new Scanner (System.in);

int a = sc.nextInt();

int b = sc.nextInt();

int c = sc.nextInt();

int d = (a+c)/2;

If (b == d)

{ System.out.println ("true, the second integer is halfway
between first and third.");

{

else

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

}

}

I/P

O/P

6.67

Average is greater
than both 4 and 6.

6

10

3

6.67

6.67 > 4

6.67 > 6

Input

5

System.out.

3

o/p.

1

true

⑩

```

import java.io.*;
import java.util.Scanner;
class WorkDistribution
{
    public static void main (String args[])
    {
        Scanner sc = new Scanner(System.in);
        int x = sc.nextInt();
        int y = sc.nextInt();
        int z = sc.nextInt();
        int d1 = sc.nextInt();
        int d2 = sc.nextInt();
        Demo de = new Demo();
        de.calculateWork(x,y,z,d1,d2);
    }
}

```

class Demo

```

public static void calculateWork (int x, int y, int z, int d1, int d2)
{
    double a = 1.0/x;
    double b = 1.0/y, c = 1.0/z, d = (a+b+c)*d1, e = (a+b)*d2;
    System.out.printf ("Work done by first d1 days (%.2f): %.2f\n", d);
    System.out.printf ("Work done in next d2 days (%.2f): %.2f",
    System.out.printf ("Remaining work: %.2f\n" "1.0 - (d+e));"
}

```

Practice At ~~home~~ Both are either even or odd.

①

```

import java.io.*;
import java.util.Scanner;
class Main
{
    public static void main (String args[])
    {
        Scanner sc = new Scanner(System.in);
        int a = sc.nextInt();
        int b = sc.nextInt();
        if (a%2==0 && b%2==0) || (a%2!=0 && b%2!=0)
            System.out.print ("Both are either even or odd");
        else
            System.out.print ("The integers have different parities");
    }
}

```

④ `import java.util.Scanner;` I/P - 5 O/P 8
class Main Integer closest to 0 is,
5

{ public static void main (String args[]){
{ Scanner sc = new Scanner (System.in);
int a = sc.nextInt();
int b = sc.nextInt();
int closest;
if (Math.abs(a) < Math.abs(b))
closest = a;
else if (Math.abs(b) < Math.abs(a))
closest = b;
else
closest = 0;
System.out.println ("The integers closest to 0 is " + closest);
}

? Integers closest to 0 is 5
Integers closest to 0 is 0

⑤ `import java.io.*;` I/P 13 O/P 1/3rd of truck : 20.00
import java.util.Scanner; 60 Less than

class Main
{ public static void main (String args[]){
}

{ Scanner sc = new Scanner (System.in);
int p = sc.nextInt();
int w = sc.nextInt();
double t = (double)w/p;
System.out.print ("One third of truck: \n", t);

if (t>p):
System.out.print (" Package of weight is less than 1/3rd
of truck ");
else
System.out.println (" Not less ");

⑥ `import java.io.*;` I/P - 25 O/P 9
import java.util.Scanner; 9 I/P 9 O/P 9
class Main

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

{ Scanner sc = new Scanner (System.in);
int a = sc.nextInt();
System.out.println (a%15);

? ?

P Challenge Yourself

I/P

O/P

① `import java.io.*;
import java.util.Scanner;
class Main
{ public static void main(String args[])
{ Scanner sc = new Scanner(System.in);
int a = sc.nextInt();
int b = sc.nextInt();
int c = sc.nextInt();
if (a == b && a == c && b == c)
{ System.out.println("Equilateral");
}
else if (a == b || a == c || b == c)
{ System.out.println("Isosceles");
}
else
{ System.out.println("Scalene");
}`

② `import java.io.*;
import java.util.Scanner;
class Main
{ public static void main(String args[])
{ Scanner sc = new Scanner(System.in);
int a = sc.nextInt();
System.out.println("Is it a perfect square?");
}`

I/P 16 O/P Is it a perfect square?
 $\sqrt{16} = 4$

`if (a > 0 && Math.sqrt(a) == Math.floor(Math.sqrt(a)))
{ System.out.println("Yes");
}
else
{ System.out.println("No");
}`

③ `import java.io.*;
import java.util.Scanner;
class Main
{ public static void main(String args[])
{ Scanner sc = new Scanner(System.in);
int a = sc.nextInt();
int b = sc.nextInt();
int c = sc.nextInt();
if (a < b + c && b < a + c && c < a + b)
{ System.out.println("Yes");
}
else
{ System.out.println("No");
}`

I/P 3 4 5 O/P Yes

```

Scanner sc = new Scanner(System.in);
int a = sc.nextInt();
System.out.println("Result: " + (a ^ (0x00)));
}
}

④ import java.io.*;
import java.util.Scanner;
class Main
{
public static void main (String args[])
{
Scanner sc = new Scanner(System.in);
int a = sc.nextInt();
int b = sc.nextInt();
if (b > (a+b)/2)
System.out.println ("Above Average");
else
System.out.println ("Below Average");
}
}

```

11/8/25 week-2

I/P 50; 60 O/P Average Score: 70
The student has passed.

skill builder

```

1). import java.util.*;
class main
{
public static void main (String args[])
{
Scanner sc = new Scanner(System.in);
int arr = new int[5];
int s=0;
for (int i=0; i<5; i++)
arr[i] = sc.nextInt();
for (int i=0; i<5; i++)
s+=arr[i];
int avg = sum/5;
if (avg >=50)
System.out.println ("Average score: " + avg);
System.out.println ("The student has passed");
else
System.out.println ("Average score: " + avg);
System.out.println ("The student has failed");
}
}

```

```

2) import java.util.Scanner;
class Main
{
    public static void main (String args[])
    {
        Scanner sc = new Scanner (System.in)
        int n = sc.nextInt();
        if (n%5 == 0)
            System.out.println (n + " is a multiple of 5");
        else if (n%7 == 0)
            System.out.println (n + " is a multiple of 7");
        else
            System.out.println (n + " is neither multiple of 5 nor 7");
    }
}

```

I/P - 10
O/P - 10 is multiple of 5

```

3. import java.util.Scanner;
class Main
{
    public static void main (String args[])
    {
        Scanner sc = new Scanner (System.in);
        double h = sc.nextDouble();
        double w = sc.nextDouble();
        double bmi = b/(a*a);
        System.out.printf ("BMI: %.2f\n", bmi);
        if (bmi < 18.5)
            System.out.println ("Classification: Underweight");
        else if (bmi > 18.6 & bmi < 24.9)
            System.out.println ("Classification: Normal weight");
        else if (bmi > 25.0 & bmi < 29.9)
            System.out.println ("Classification: Overweight");
        else
            System.out.println ("Classification: Obese");
    }
}

```

Input: 21.2
Output: 45.2

```

4. import java.util.*;
class Main
{
    public static void main (String args[])
    {
        Scanner sc = new Scanner (System.in);
        int cost = sc.nextInt();
        double d = (double) cost;
        int year = sc.nextInt();
        for (int i=1; i<=year; i++)
        {
            d = d - (d * 0.15);
        }
        System.out.printf ("Current value: %.2f\n", d);
    }
}

```

```

if (d > 1000) {
    System.out.println ("Category: High");
} else if (d >= 500 & d <= 1000) {
    System.out.println ("Category: Medium");
} else {
    System.out.println ("Category: Low");
}

```

5. import java.util.*;

```

class main {
    public static void main (String args[])
    {
        Scanner sc = new Scanner (System.in);
        int a = N;
        int c = 0, s = 0;
        do {
            int digit = a % 10;
            if (digit == s)
                c++;
            a = a / 10;
        } while (a > 0);
        if (c == s)
            System.out.println ("The digit matches the sum");
        else
            System.out.println ("The digit does not match");
    }
}

```

The digits matches the sum

6. import java.util.*; Input 5

```

class main {
    public static void main (String args[])
    {
        Scanner sc = new Scanner (System.in);
        int n = sc.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 >= 0; i--)
            for (int j = 1; j <= i; j++)
                System.out.print ("*");
        System.out.println ();
    }
}

```

```

7. import java.util.*;
class main
{
    public static void main (String args[])
    {
        Scanner sc = new Scanner (System.in); // I/P + fileread
        int n = sc.nextInt();
        for (int i=1; i<=n; i++) { // loop
            for (int s=1; s<=n-i; s++) { // loop
                System.out.print(" "); // O/P
            }
            for (int j=1; j<2*i-1; j++) { // loop
                System.out.print(j);
            }
            System.out.println(); // O/P
        }
        System.out.println(); // O/P
    }
}

```

```

8 import java.util.*;
class main
{
    public static void main (String args[])
    {
        Scanner sc = new Scanner (System.in); // I/P + fileread
        int n = sc.nextInt();
        int c=0;
        int i, j, k;
        for (int i=1; i<=9; i++) { // loop
            for (int j=0; j<=9; j++) { // loop
                if ((j==i) || (j+i==9)) { // condition
                    continue; // skip
                }
                for (k=0; k<=9; k++) { // loop
                    if ((k==i) || (k==j)) { // condition
                        continue; // skip
                    }
                    int num = i*100+j*10+k; // calculation
                    if (num%3==0) { // condition
                        System.out.println(num); // O/P
                    }
                }
            }
        }
    }
}

```

Week - 5

1. import java.util.*;

class main

{ public static void main(String args[])

{ Scanner sc = new Scanner(System.in); int n; }

int n = sc.nextInt(); } O/P 3

int arr[] = new int[n]; to 28 47

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

arr[i] = sc.nextInt(); } 38

int sum = 0; } 5

Arrays.sort(arr); } 6

for (int i=0; i<n; i++) } 7

sum = arr[i] + arr[n-i-1]; } 8

System.out.println(sum); } 9

2. Import java.util.*;

class main

{ public static void main (String args[])

Scanner sc = new Scanner(System.in); int n; }

int n = sc.nextInt(); } 1 2 3

int arr[] = new int[n]; } 4 5 6

for (int i=0; i<n; i++) { } 7 8 9

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

arr[i][j] = sc.nextInt(); } }

O/P

Sum of main diagonal : 15

Sum of Secondary diagonal : 15

int main = 0; } }

int diagonal = 0; } }

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

main = arr[i][i]; } }

diagonal = arr[i][n-1-i]; } }

System.out.println("Sum . of main diagonal : "+main); } }

System.out.println("Sum of Secondary diagonal : "+diagonal); } }

```

3) import java.util.*;
class main
{ public static void main(String args[])
    {
        Scanner sc = new Scanner(System.in);
        int n = sc.nextInt();
        int arr[] = new int[n];
        for(int i=0; i<n; i++)
        {
            arr[i] = sc.nextInt();
        }
        int sum = 0;
        for(int i=0; i<n-1; i++)
        {
            sum = arr[0] + arr[n-1];
            System.out.println("sum: " + sum);
        }
    }
}

```

```

4) import java.util.*;
class main
{ public static void main(String args[])
    {
        Scanner sc = new Scanner(System.in);
        int n = sc.nextInt();
        int m = sc.nextInt();
        int arr[] = new int[m];
        int brr[] = new int[m];
        int crr[] = new int[m];
        for(int i=0; i<n; i++)
        {
            for(int j=0; j<m; j++)
            {
                arr[j] = sc.nextInt();
            }
            for(int i=0, j=0; i<n; i++)
            {
                for(int j=0; j<m; j++)
                {
                    brr[j] = arr[j];
                }
                for(int i=0, j=0; i<n; i++)
                {
                    for(int j=0; j<m; j++)
                    {
                        crr[j] = arr[j] + brr[j];
                    }
                    System.out.println(crr[j]);
                }
            }
        }
    }
}

```

```

import java.util.*;
class main {
    public static void main (String args[]) {
        Scanner sc = new Scanner (System.in);
        int n = sc.nextInt();
        int arr[] = new int [n];
        for (int i=0; i<n; i++) {
            arr[i] = sc.nextInt();
        }
        boolean repeat = false;
        for (int i=0; i<n; i++) {
            for (int j=i+1; j<n; j++) {
                System.out.println (arr[i]);
                if (repeat)
                    break;
            }
            if (!repeat)
                System.out.println ("No repeated element");
        }
    }
}

```

Week - 4

1. Import java.util.*;

```

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

```

```

2. import java.util.*;
class main {
    public static void main (String args[]) {
        Scanner sc = new Scanner (System.in);
        int n = sc.nextInt();
        sc.nextLine();
        String sentence = sc.nextLine();
        String[] words = sentence.split (" ");
        Arrays.sort (words);
        for (int i=0; i<n; i++) {
            System.out.print (words[i]);
            if (i < n-1) {
                System.out.print (" ");
            }
        }
    }
}

```

Cybersecurity A1
O/P
AI Cybersecurity

```

3. import java.util.*;
class main {
    public static void main (String args[]) {
        Scanner sc = new Scanner (System.in);
        int n = sc.nextInt();
        sc.nextLine();
        for (int i=0; i<n; i++) {
            String s = sc.nextLine();
            if (s.length() == 10 && s.charAt(0) == 'P') {
                if (s.matches ("P0-9J+")) {
                    System.out.println ("Yes");
                } else {
                    System.out.println ("No");
                }
            }
        }
    }
}

```

```

4) import java.util.*;
class main {
    public static void main (String args[]) {
        Scanner sc = new Scanner (System.in);
        String[] sen = sc.nextLine().split (" ");
        boolean found = false;
        for (String w : sen)
        {
        }
    }
}

```

```

if (w.matches("[a-zA-Z]+") & w.length() >= 2)
    System.out.println(w);
    found = true;
}
if (!found) {
    System.out.println("No valid words");
}

```

O/P - No valid words

⑤ Import java.util.*; *import java.util.*;* I/P - 1
 class main {
 public static void main(String args) I/P - Yes.
 Scanner sc = new Scanner(System.in)
 int T = sc.nextInt();
 sc.nextLine();
 for (int i = 0; i < T; i++) {
 if (sc.nextLine().length() == 4 & sc.nextLine().matches("[0-9]+"))
 if (sc.nextLine().charAt(0) != sc.nextLine().charAt(1))
 System.out.println("Yes");
 else
 System.out.println("No");
 }
}

Week 5 Ques. no 2

① import java.util.*;
 class Bank {
 private int accno;
 private String name;
 private double bal;
 Bank (int accno, String name, double bal)
 {
 this.accno = accno;
 this.name = name;
 this.bal = bal;
 }
}

```

int getaccno() {
    return accno;
}

String getname() {
    return name;
}

double getbal() {
    return bal;
}

void setaccno(int accno) {
    this.accno = accno;
}

void setname(String name) {
    this.name = name;
}

void setbal(double bal) {
    this.bal = bal;
}

void deposit(double amt) {
    if (amt >= 0)
        bal += amt;
}

void withdraw(double amt) {
    if (amt >= 0 & amp; bal >= amt)
        bal -= amt;
}

public static void main (String args[]) {
    Scanner sc = new Scanner (System.in);
    int n = sc.nextInt();
    for (int i=0; i<n; i++) {
        int accno = sc.nextInt();
        String name = sc.nextLine();
    }
}

```

```

double bal = sc.nextDouble();
double depositam = sc.nextDouble();
double w = sc.nextDouble();
Bank b = new Bank(accno, name, bal);
b.deposit(depositam);
b.withdraw(w);

System.out.println("Account Number: " + b.getaccno());
System.out.println("Customer Name: " + b.getname());
System.out.printf("Final Balance: %.1f", b.getbal());
}

@ import java.util.*;
class Electricity
{
    private int cusid;
    private String name;
    private double units;
    Electricity (int cusid, String name, double units)
    {
        this.cusid = cusid;
        this.name = name;
        this.units = units;
    }
    int getcusid() void setcusid(int cusid)
    {
        this.cusid = cusid;
    }
    void setname(String name)
    {
        this.name = name;
    }
    void setunits(double units)
    {
        this.units = units;
    }
    double final (double units)
    {
        double amt = 0.0;
        if (units <= 100)
            amt = units * 5;
        else if (units > 100 & units <= 200)
            amt = 100 * 5 + (units - 100) * 7;
        else if (units > 200)
            amt = 100 * 5 + 100 * 7 + (units - 200) * 10;
    }
}

```

```

    float (amt > 2000) (Customer prints 2000 or more)
    {
        amt = amt * 0.95;
    }
    return amt;
}

void display()
{
    System.out.println("Customer ID: " + cusId);
    System.out.println("Customer Name: " + name);
    System.out.println("Final Bill: ₹" + EPnal);
}

public static void main(String args[])
{
    Scanner sc = new Scanner(System.in);
    int n = sc.nextInt(); // taking two integers
    for (int i = 0; i < n; i++)
    {
        int cusId = sc.nextInt();
        sc.nextLine();
        String name = sc.nextLine();
        double units = sc.nextDouble();
        Electricity e = new Electricity(cusId, name, unit);
        e.display();
    }
}

```

(3) Import java.util.*; $\frac{1}{2}$ min. $\frac{1}{2}$ due fix

```

class Student
{
    private int id;
    private String name;
    private int sub;
    Student(int id, String name, int sub)
    {
        this.id = id;
        this.name = name;
        this.sub = sub;
    }
    void setId(int id)
    {
        this.id = id;
    }
}

```

```

void setname (CString name)
{
    this.name = name;
}

void setsub (Pnt sub)
{
    this.sub = sub;
}

double calculate ()
{
    double fee = 1000 + (sub * 1800);
    if (sub > 5)
        fee = fee * 0.8;
    return fee;
}

void display ()
{
    System.out.println ("Enrollment ID : " + id);
    System.out.println ("Student Name : " + name);
    System.out.println ("Final Fee : " + calculate ());
    System.out.println ("");
}

public static void main (String args [])
{
    Scanner sc = new Scanner (System.in);
    int n = sc.nextInt ();
    sc.nextLine ();
    for (int i = 0; i < n; i++)
    {
        int id = sc.nextInt ();
        sc.nextLine ();
        String name = sc.nextLine ();
        int sub = sc.nextInt ();
        Student s = new Student (id, name, sub);
        s.display ();
    }
}

```

Week - 6

① class PremiumSubscription

```

double base;
double service;
double extra;
PremiumSubscription (double b, double s, double e)
{
    base = b;
    service = s;
    extra = e;
}

double calculateMonthlyCost ()
{
    return base + service + cost;
}

```

② class product {
 public double price;
 Product (double price) {
 this. price = price;
 } }

I/P 50.00
 O/P 0.20

class DiscountedProduct extends products {
 DiscountedProduct (double price, double rate) {
 super (price);
 this. rate = rate; } }

private double rate;

double calculateSellingPrice () {

return price * (1 - rate); } }

③ class SalesTaxCalculator {
 static double calculateFinalPrice (int price, int tax) {
 return price + (price * tax) / 100; }
 static double calculateFinalPrice (double price, double tax) {
 return price + (price * tax) / 100; } }

④ class Cuboid {
 double length, width, height;
 Cuboid (double l, double w, double h) {
 length = l;
 width = w;
 height = h; }
 double calculateVolume () {
 return length * height * width; } }

class Cube extends Cuboid {
 Cube (double s) {
 super (s, s, s); } }

public double calculateVolume () {
 return Math. pow (length, 3); } }

```

⑥ class Item {
    protected String name;
    protected double price;
    public Item (String name, double price) {
        this.name = name;
        this.price = price;
    }
    public double calculateCost () {
        return price;
    }
}

class Produce extends Item {
    public Produce (String name, double price) {
        super(name, price);
    }
    public double calculateCost () {
        return price;
    }
}

class OrganicProduce extends Produce {
    public OrganicProduce (String name, double price) {
        super(name, price);
    }
    public double calculateCost () {
        return price * 0.90;
    }
}

```

Week - 7

1. Interface HealthCalculator

```

double calculateBMI (double weight, double height);

```

class BMIcalculator implements HealthCalculator {
 public double calculateBMI (double weight, double height) {
 if (weight <= 0 || height <= 0) {
 return -1;
 }
 return weight / (height * height);
 }
}

I/P - 70.0 O/P

1.75 BMI : 22.86.

② Interface InterestCalculator {

```
double SimpleInterest(double principal, double rate,
                      int time);
```

class SimpleInterestCalculator implements InterestCalculator {

public double SimpleInterest(double principal, double rate) {

```
return (principal * rate * time) / 100;
```

I/P: 1000.00
5.00
2

O/P: Simple Interest: 100.0,

③ Interface AgeCalculator {

int calculateAge(int birthYear);

class HumanAgeCalculator implements AgeCalculator {

private static final int currentYear = 2024;

public int calculateAge(int birthYear) {

```
return -(2024 - birthYear);
```

④ Interface CostCalculator {

void getEnergyDetails(Scanner scanner);

class EnergyConsumptionTracker implements CostCalculator {

double ratePerUnit;

int numDays; double dailyConsumption;

EnergyConsumptionTracker(double ratePerUnit, int numDays) {

```
this.ratePerUnit = ratePerUnit;
this.numDays = numDays;
```

this.dailyConsumption = new Double[numDays];

public void getEnergyDetails(Scanner scanner) {

```
for (int i=0; i<numDays; i++) {
    dailyConsumption[i] = scanner.nextDouble();
```

public void calculateAndDisplayCost() {

System.out.println("Daily cost: "));

```

double t=0.0;
for (int i=0; i< numDays; i++) {
    double c = dailyConsumption[i] * ratePerUnit;
    t += c;
}
System.out.printf("Day %d: Rs %.2f/k.n", i+1, a);
System.out.println("Total Day-wise cost");
I/P : 0.01
3
10.0 20.0 30.0
O/P Day 1: Rs.0.10
Day 2: Rs.0.20
Day 3: Rs.0.30
Total Energy cost:
Rs.0.60.

```

⑤ Interface Inventory

```

void addProduct(String name, double price, int quantity);
double calculateTotalValue();
class Product {
    private String name;
    private double price;
    private int quantity;
    public Product(String name, double p, int q) {
        name = n;
        price = p;
        quantity = q;
    }
    public double getvalue() {
        return price * quantity;
    }
}

```

```

class SimpleInventory implements Inventory {
    private Product[] products;
    private int count;
    public SimpleInventory(int capacity) {
        products = new Product[capacity];
        count = 0;
    }
}
```

```

public void addProduct(String n, double p, int q) {
    if (c < products.length) {
        Product p = new Product(n, p, q);
        System.out.println("Product added");
        c++;
    }
}
```

```

double calculateTotalValue() {
    double total = 0.0;
    for (int i=0; i<count; i++) {
        total += products[i].getValue();
    }
    return total;
}

```

Input: laptop
800.0
3
2
5
3

output Product added to inventory

Total inventory value: \$2400.0

Invalid choice. Please select a valid choice

Example I/p: 0245 . 3

sample@gmail.com

Week - 8

(Ques & O/P as ab)

Valid email.

① import java.util.*;

class main

{ public static void main (String args[])

{ Scanner sc = new Scanner (System. in);

String e = sc.nextLine();

if (e.startsWith("biloxi")) { taking two inputs }

{ try { int c = e.length() - e.replace("@", " ").length();

else if (c != 1 || e.startsWith(".") || e.endsWith("."))

throw new ATTHERateException();

{ e.startsWith(".") || e.endsWith(".") || (! e.contains("@")) || e.endsWith("@")); }

throw new DotException();

int i = e.indexOf("@");

String id = e.substring(0, i);

{ ! after A + . contains (".") } }

((".") . "invalid") throw new DotException();

String domain = emil.substring (e.lastIndexOF("."), e.length());

{ ! domain.equals("in") || domain.equals("com") || domain.equals("net") || domain.equals("bit") }

throw new DomainException();

System.out.println("Valid email");

catch (Exception e) {

System.out.println(e.getMessage());

System.out.println("Invalid email");

I/P 120

O/P

Meeting scheduled successfully!

② import java.util.*;
class InvalidDurationException extends Exception
{ InvalidDurationException()
{ super("Invalid");
}
public class Main
{ public static void main (String args[]){
Scanner sc = new Scanner (System.in);
int d = sc.nextInt();
try { if (d <= 20 || d > 240) {
throw new InvalidDurationException ("Invalid");
}
else { System.out.println("Meeting scheduled");
}
}
catch (InvalidDurationException e){
System.out.println("Error: " + e.getMessage());
}
}

③ I/P Alice valid. O/P Alice valid.

import java.util.*;
class InvalidUserException extends Exception
{ InvalidUserException()
{ super("Invalid");
}
public class Main
{ public static void main (String args[]){
Scanner sc = new Scanner (System.in);
String s = sc.nextLine();
try { if (s.length () < 5) { if (s.contains(" ")){
throw new InvalidUserException();
}
else { System.out.println ("valid");
}
}
catch (InvalidUserException e){
System.out.println ("Error: " + e.getMessage());
}
}

④

```

import java.util.*;
class InvalidAgeException extends Exception
{
    public InvalidAgeException(String m)
    {
        super(m);
    }
}

class Main
{
    public static void main(String args[])
    {
        Scanner sc = new Scanner(System.in);
        try
        {
            int a = sc.nextInt();
            if (a < 18)
            {
                throw new InvalidAgeException("Not valid");
            }
            else
            {
                System.out.println("Eligible to vote");
            }
        }
        catch (InvalidAgeException e)
        {
            System.out.println("Exception occurred: " + e);
        }
        catch (InputMismatchException e)
        {
            System.out.println("An error occurred: " + e);
        }
    }
}

```

⑤

```

import java.util.*;
class InvalidfilenameException extends Exception
{
    InvalidfilenameException()
    {
        super("Invalid");
    }
}

class Main
{
    public static void main(String args[])
    {
        Scanner sc = new Scanner(System.in);
        String s = sc.nextLine();
        try
        {
            if (s.length() < 3 || s.matches("[^a-zA-Z0-9]+"))
            {
                throw new InvalidfilenameException();
            }
            else
            {
                System.out.println("valid");
            }
        }
    }
}

```

```
Catch(InvalidFileNameException e)
```

```
{  
    System.out.println(e.getMessage());  
}
```

Week - 9

```
① import java.util.*;  
class Main {  
    public static void main(String args[]) {  
        Scanner sc = new Scanner(System.in);  
        int n = sc.nextInt();  
        for (int i = 0; i < n; i++) {  
            int num = sc.nextInt();  
            if (!list.isEmpty() || num > list.get(list.size() - 1)) {  
                list.add(num);  
            }  
        }  
        System.out.print(list);  
    }  
}  
I/P :  
[3, 5, 9, 11, 13]  
O/P : [3, 5, 9, 11, 13]
```

```
② import java.util.*;  
class Main {  
    public static void main(String args[]) {  
        Scanner sc = new Scanner(System.in);  
        int n = sc.nextInt();  
        sc.nextLine();  
        ArrayList<String> names = new ArrayList<String>;  
        for (int i = 0; i < n; i++) {  
            names.add(sc.nextLine());  
        }  
        String search = sc.nextLine();  
        int c = 0;  
        for (String name : names) {  
            if (name.equals(search)) {  
                c++;  
            }  
        }  
        System.out.println(c);  
    }  
}
```

```

③ import java.util.*;
public class Main {
    public static void main (String args[]) {
        Scanner sc = new Scanner (System.in);
        int n = sc.nextInt();
        LinkedList<String> pl = new LinkedList<>()
        int CI = 0;
        for (int i=0; i<n; i++) {
            String input = sc.nextLine();
            if (input.startsWith("ADD")) {
                String song = input.substring(4);
                pl.add(song);
            } else if (input.startsWith("Remove")) {
                String song = input.substring(7);
                int index = playIndexof(song);
                if (index == -1) {
                    System.out.println("Song not found");
                } else {
                    pl.remove(index);
                    if (pl.isEmpty()) {
                        CI = 0;
                    } else if (index < CI) {
                        CI--;
                    }
                }
            } else if (input.equals("show")) {
                if (pl.isEmpty()) {
                    CI = 0;
                } else {
                    CI++;
                    System.out.println("Song " + CI + ": " + pl.get(CI));
                }
            } else if (input.equals("next")) {
                if (CI < pl.size() - 1) {
                    CI++;
                    System.out.println("Song " + CI + ": " + pl.get(CI));
                } else {
                    System.out.println("Empty");
                }
            }
        }
    }
}

```

```

11. import java.util.*;
class Main {
    public static void main (String args[]) {
        Scanner sc = new Scanner (System.in);
        int n = sc.nextInt();
        TreeSet<Integer> s = new TreeSet<>();
        for (int i=0; i<n; i++) {
            int num = sc.nextInt();
            s.add (num);
        }
        int find = sc.nextInt();
        if (s.contains (find))
            System.out.println ("find is present");
        else
            System.out.println ("Not present");
    }
}

```

Input: 4
2 4 5 6
5
O/P 5 is present!

```

2. import java.util.*;
class Main {
    public static void main (String args[])
    {
        Scanner sc = new Scanner (System.in);
        int n = sc.nextInt();
        sc.nextLine();
        String[] arr = new String[n];
        for (int i=0; i<n; i++)
        {
            arr[i] = sc.nextLine();
        }
        TreeMap<Character, Integer> map = new
        TreeMap<>();
        for (int i=0; i<arr.length; i++)
        {
            for (int j=0; j<arr[i].length(); j++)
            {
                if (arr[i].charAt(j) == ' ')
                    continue;
                map.put (arr[i].charAt(j), map.getOrDefault
                (arr[i].charAt(j), 0)+1);
            }
        }
    }
}

```

```
System.out.println("Character Frequency:");
for(Map.Entry<Character, Integer> entry : map.entrySet()){
    System.out.println(entry.getKey() + ". " + entry.getValue());
}
Eq: I/P   Q
      Hello world
      Java
```
