

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: 3

(a). String type (3)

(b). int type (4)

(c). float type (5)

(d). double type (6)

(e). long type (7)

(f). short type (8)

(g). byte type (9)

(h). char type (10)

(i). boolean type (11)

(j). none of the above (12)

(a). int type (3)

(b). float type (4)

(c). double type (5)

(d). long type (6)

(e). short type (7)

(f). byte type (8)

(g). char type (9)

(h). boolean type (10)

(i). none of the above (11)

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

$$\begin{aligned} \text{Explanation: } 90 - 90 &= 0 \\ 100 - 90 &= 10 \\ 100 - 80 &= 20 \end{aligned}$$

Then 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 || (a/b)%3 == 0) || ((a+b)%3 == 0 || (b-a)%3 == 0)
 System.out.println("One of the integers is divisible by 3");
 else
 System.out.println("Neither of the integers meets the
 divisibility condition");
 }
 }

I/P - 4
 3
 O/P
 One of the integers
 is positive while
 the other is
 not divisible by 3.

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.
 $a+b = 3$
 $a \times b = 2$

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

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? " + (Math.sqrt(a) * Math.sqrt(a)) == a);
 }
}`

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("Is it a perfect square? " + ((int)(Math.sqrt(a)) * (int)(Math.sqrt(a))) == a);
 }
}`

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();
 System.out.println("Is it a perfect square? " + ((int)(Math.sqrt(a)) * (int)(Math.sqrt(a))) == a);
 }
}`

⑤ `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? " + ((int)(Math.sqrt(a)) * (int)(Math.sqrt(a))) == a);
 }
}`

```

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 = h/(w*w);
        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: 1.2
Output: 45.2
 $BMI = \frac{1.2}{1.2 \times 1.2} = 31.29$
Classification: obese.

```

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.*; ^{import java.io.*;}

```

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 ();
    }
}

```

Input 5

 * *
 ** *
 *** *
 **** *

```

import java.util.*;
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 s=1; s<=n-i; s++)
            {
                System.out.print (" ");
            }
            for (int j=1; j<2*i-1; j++)
            {
                System.out.print (j);
            }
            System.out.println ();
        }
    }
}

```

```

8 import java.util.*;
class main
{ public static void main (String args[])
{ Scanner sc = new Scanner (System.in);
int n = sc.nextInt();
int c = 0;
int i, j, k;
for (int i=0; i<n; i++)
    for (int j=0; j<=n; j++)
        if ((j==i) || (k==i+j))
            continue;
        for (k=0; k<=n; k++)
            if ((k==i) || (k==j+k))
                continue;
            int num = i * 1000 + 10 + k;
            if (num % 3 == 0)
                System.out.println(num);
            c++;
}
}

```

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();
int arr[] = new int[n];
for(int i=0; i<n; i++)
arr[i] = sc.nextInt();
int sum = 0;
Arrays.sort(arr);
for(int i=0; i<n; i++)
sum = arr[i] + arr[n-i-1];
System.out.println(sum);
}
```

2. 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++)
for(int j=0; j<n; j++)
arr[i][j] = sc.nextInt();
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)
```

O/P
Sum of main diagonal : 75

Sum of Secondary diagonal : 15

```

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[i]+arr[n-1-i];
            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[n][m];
        int brr[][] = new int[n][m];
        int crr[][] = new int[n][m];
        for(int i=0; i<n; i++)
        {
            for(int j=0; j<m; j++)
            {
                arr[i][j] = sc.nextInt();
            }
        }
        for(int i=0; i<n; i++)
        {
            for(int j=0; j<m; j++)
            {
                brr[i][j] = arr[i][m-j-1];
            }
        }
        for(int i=0; i<n; i++)
        {
            for(int j=0; j<m; j++)
            {
                crr[i][j] = arr[i][j] + brr[i][j];
            }
        }
        System.out.println(crr);
    }
}

```

```

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

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 void calculateFinalPrice (int price, int tax) {
 return price + (price * tax) / 100; }
 static double calculateFinalPrice (double price, double tax) {
 return price + (price * tax) / 100; }
 (cost, mon) equals 3 (cost)

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; }
 (length, width, height) = 3 (length, width, height)

class Cube extends Cuboid {
 Cube (double s) {
 super (s, s, s); }
 (length, width, height) = 3 (length, width, height)

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

```

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")) {
            try {
                int c = e.length() - e.replace("@", "").length();
                if (c != 1 || e.startsWith("@") || e.endsWith("@"))
                    throw new ATTheRateException();
                if (e.startsWith(".") || e.endsWith(".") || (!e.contains
                    ("@") || e.endsWith("@")))
                    throw new DotException();
                int i = e.indexOf("@");
                String u = e.substring(i+1);
                if (!u.contains("."))
                    throw new DotException();
                String domain = e.substring(e.lastIndexOf("."));
                if (!domain.equals("in") || domain.equals("com"))
                    if (domain.equals("net") || domain.equals("bit"))
                        throw new DomainException();
            } catch (Exception e) {
                System.out.println("Valid email");
            }
        }
    }
}

```

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 120 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 || 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
```
