

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 = 5, 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(b);`

`System.out.println(bitwiseAnd);`

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

Answer: 15

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: Hello, World

8. class Program?

`public class Program {`

`public static void main()`

`{`

`System.out.println("Hello World");`

`}`

`}`

`}`

`}`

`}`

`}`

`}`

`}`

`}`

`}`

`}`

`}`

`}`

`}`

`}`

`}`

`}`

`}`

`}`

`}`

`}`

`}`

1) Skill builder.

```

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

```

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) Program

```

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 > 0 & b % 3 == 0) || (a % 3 == 0 & b > 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 required condition");
    }
}

```

I/P - 4
3

O/P - One of the integers is positive while the other is not divisible by 3.
(4 = 0 mod 3)
(3 = 0 mod 3)

3) Main

```

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)));
    }
}

```

Input 8
Output Result : 1
 $(1<<7) = 128$
 $128 & 8 = 0$

⑦

```

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("I/P = " + a);
        if (a <= 0)
            System.out.println("I/P - True");
        else
            System.out.println("I/P - False");
    }
}

```

-45 ≤ 0
-45 is odd
10
So 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 + %.2f) : %.2f\n", d);
 System.out.printf ("Work done in next d2 days (%.2f + %.2f) : %.2f\n", e, d-e);

Practice At ~~home~~
 I/P 2 -4 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 - 15 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);  
}
```

? ~~int p = sc.nextInt();
int w = sc.nextInt();
double t = (double)w/p;~~

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

? ~~if (t > p):
 System.out.print (" Package & 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;` 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?
 : (" + (a > 0 && Math.sqrt(a) * Math.
 sqrt(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("Result: " + (a ^ (a & FF)));
}
}

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

skill Builder

i). 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();
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");
}
}

```

3) 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");
    }
}

```

I/P - 1.2
O/P - 45.2

BMI = 31.39
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
 $2 + 0 = 2$
 $20 = 2$ (Count)

```

6. 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 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
* *
* * *
* * * *
* * * * *
* * * * * *
* * * * * * *
* * * * * * * *

```

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

```

```

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

```

(charact "z" : 3 digit number, return; two methods
charact "y" : 3 digit number printing "y" and "z" using two methods)

Week-5

1. 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;
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);
}
```

* Interview point 2
Turn and

O/P

3

10 28 47

38

(e. like over & over & over & over)

from now

(Top part) from b/w state since?

o/p

1 2 3

4 5 6

7 8 9

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); // I/P
        int n = sc.nextInt(); // Input value 3
        int arr[] = new int[n]; // Array size 1 2 3
        for(int i=0; i<n; i++) { // for loop
            arr[i] = sc.nextInt(); // Input values
        }
        int sum = 0; // Sum variable
        for(int i=0; i<n-1; i++) { // for loop
            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); // I/P
        int n = sc.nextInt(); // Input value 5
        int m = sc.nextInt(); // Input value 5
        int arr[] = new int[m]; // Array size 1 2 3
        int brr[] = new int[m];
        int crr[] = new int[m];
        for(int i=0; i<n; i++) { // for loop
            for(int j=0; j<m; j++) { // for loop
                arr[j] = sc.nextInt();
            }
            for(int i=0; i<n; i++) { // for loop
                for(int j=0; j<m; j++) { // for loop
                    brr[j] = sc.nextInt();
                }
                for(int i=0; i<n; i++) { // for loop
                    for(int j=0; j<m; j++) { // for loop
                        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)
                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(" ");
 }
 }
 }
}

```

Input  
Output  
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) == 'o' && 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 + " is valid");
```

```
found = true;
```

```
} O/P - a b c
if (!found) { O/P - No valid words
```

```
System.out.println("No valid words");
```

⑤ Import java.util.\*; I/O - 1

class main { 1234

```
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++) {
```

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

```
if (s.length() == 4 && s.matches("To-9j+"))
```

```
&& s.charAt(0) != s.charAt(1)) {
```

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

```
else {
```

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

## Week - 5 (Two, notes)

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; amt <= bal)
 bal -= amt;
}

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 accno = sc.nextInt();
 sc.nextLine();
 String name = sc.nextLine();
 }
}

```

```

 double bal = sc. next Double ();
 double depositam = sc. next Double ();
 double w = sc. next Double ();
 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 ());
 }
}

```

```

② 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 + (units - 200) * 10;
 }
}

```

```

 if (amt > 2000)
 {
 amt = amt * 0.75;
 }
 return amt;
}

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

public static void main(String args[])
{
 Scanner sc = new Scanner(System.in);
 int n = sc.nextInt(); // taking two integers
 sc.nextLine(); // taking two strings
 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.\*; java.io.\* = 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 (String name)
{
 this.name = name;
}

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

double calculate ()
{
 double fee = 1000 + (sub * 800);
 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 ());
}

public static void main (String args [])
{
 Scanner sc = new Scanner (System.in);
 int n = sc.nextInt ();
 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;  
 }  
 }  
 class DiscountedProduct extends Product {

DiscountedProduct (double price, double rate) {  
 super (price);  
 this. rate = rate;  
 }  
 }  
 private double rate;  
 double calculateSellingPrice () {  
 return price \* (1 - rate);  
 }  
 }  
 I/P O/P  
 100.0 110  
 105.00.

③ class SalesTaxCalculator {  
 static int calculateFinalPrice (int price, int tax) {  
 return price + (price \* tax) / 100;  
 }  
 static double calculateFinalPrice (double price, double tax) {  
 return price + (price \* tax) / 100;  
 }  
 }  
 I/P O/P  
 100 110  
 105.00.

④ class Cuboid {  
 double length, width, height;  
 Cuboid (double l, double w, double h) {  
 length = l;  
 width = w;  
 height = h;  
 }  
 }  
 I/P O/P  
 5 5 5  
 125

double calculateVolume () {  
 return length \* height \* width;  
 }  
 }  
 I/P O/P  
 5 5 5  
 125

class Cube extends Cuboid {  
 Cube (double s) {  
 super (s, s, s);  
 }  
 }  
 I/P O/P  
 5 125

public double calculateVolume () {  
 return Math. pow (length, 3);  
 }  
 }  
 I/P O/P  
 5 125

```

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,
 int time)
 {
 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);
}
```

I/P : 1934

O/P - Your age  
is 90.

```
 class HumanAgeCalculator implements AgeCalculator
 {
 private static final int CURRENT_YEAR = 2024;
 public int calculateAge(int birthYear)
 {
 return -(CURRENT_YEAR - birthYear);
 }
 }
```

### ④ Interface CostCalculator {

```
 void getEnergyDetails(Scanner scanner);
 void calculateAndDisplayCost();
```

```
 class EnergyConsumptionTracker implements CostCalculator
 {
 double ratePerUnit;
 }
```

```
 int numDays;
 double r; dailyConsumption;
```

```
 EnergyConsumptionTracker(double ratePerUnit,
 int numDays)
```

```
 this.ratePerUnit = r;
 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.println("Day " + i + ": Rs " + c);
}
System.out.println("Total Day-wise cost: Rs." + t);

```

I/P : 0.01  
 10.0 20.0 30.0  
 O/P Day-wise cost  
 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[C++] = new Product(n, p, q);
 System.out.println("Product added");
 } else {
 System.out.println("Inventory is full");
 }
}
```

```

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: 02-03-13

Week -8

sample@gmail.com

① import java.util.\*;

```

class mail
{
 public static void main (String args[])
 {
 Scanner sc = new Scanner (System. in);
 String e = sc.nextLine();
 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 (! afterA +. contains (".")) .
 throw new DotException ();
 String domain = emil. substring (e. lastIndexOf
 ("@") + 1);
 if (! domain. equals ("in") || domain. equals ("com")
 || domain. equals ("net") || domain.equals ("bi"))
 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 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 InvalidUserException();  
}  
else {  
System.out.println ("valid");  
}  
}  
catch (InvalidUserException e){  
System.out.println (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 (FileNotFoundException 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();
 Linked List <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);
 playList.add (song);
 } else if (input.startsWith ("Remove")) {
 String song = input.substring (7);
 int index = playList.indexOf (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 ()) {
 System.out.println ("Empty");
 } else {
 for (String s : pl) {
 System.out.print (s);
 }
 System.out.println ();
 }
 } else if (input.equals ("Next")) {
 if (pl.isEmpty ()) {
 System.out.println ("Empty");
 } else {
 int i = pl.size () - 1;
 System.out.print (pl.get (i));
 System.out.println ();
 }
 }
 }
 }
}

```

```

1). 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())
```

Eg: I/P    O  
Hello world  
Java

---

---