



INTERVIEW GUIDE

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Java Interview Programs:

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Basic Programs

1. Write a java program to find out greatest of two numbers?

```
package com.ihub.www;
import java.util.Scanner;
class GreatestOfTwo
{
    //asking inputs
    Scanner sc=new Scanner(System.in);
    System.out.println("Enter the First Number :");
    int a = sc.nextInt();
    System.out.println("Enter the Second Number :");
    int b = sc.nextInt();
    //logic
    int max=(a>b)?a:b;
    System.out.println(max+" is greatest");
}
```

Inputs:

Enter the First Number:	10
Enter the Second Number:	15

Output:

15 is greatest

2. Write a java program to find out greatest of three numbers?

```
package com.ihub.www;
import java.util.Scanner;
class GreatestOfThree
{
    //asking inputs
    Scanner sc=new Scanner(System.in);
    System.out.println("Enter the First Number :");
    int a = sc.nextInt();
    System.out.println("Enter the Second Number :");
    int b = sc.nextInt();
    System.out.println("Enter the Third Number :");
    int c = sc.nextInt();

    //logic
    int max=(a>b)?((a>c)?a:c):(b>c)?b:c;
    System.out.println(max+" is greatest");
}
```

Inputs:

Enter the First Number:	25
Enter the Second Number:	12
Enter the Third Number:	5

Output:

25 is greatest

3. Write a java program to find out swapping of two numbers?

```
package com.ihub.www;
import java.util.Scanner;
class SwappingOfTwo
{
    //asking inputs
    Scanner sc=new Scanner(System.in);
    System.out.println("Enter the First Number :");
    int a = sc.nextInt();
    System.out.println("Enter the Second Number :");
    int b = sc.nextInt();
    System.out.println("Before swapping a="+a+ " and b="+b);
    //logic
    a = a + b;
    b = a - b;
    a = a - b;
    System.out.println("After swapping a="+a+ " and b="+b);
}
```

Inputs:

```
Enter the First Number:      10
Enter the Second Number:    20
```

Output:

```
Before swapping a=10 and b=20
After swapping a=10 and b=20
```

4. Write a java program to find out given number even or odd without using modules operator?

```
package com.ihub.www;
import java.util.Scanner;
class EvenOrOdd
{
    //asking inputs
    Scanner sc=new Scanner(System.in);
    System.out.println("Enter the Number :");
    int n = sc.nextInt();
    //logic
    If((n&1)==0)
        System.out.println("It is even number");
    else
        System.out.println("It is odd number");
}
```

Inputs:

```
Enter the Number:      6
```

Output:

```
It is even number
```

5. Write a java program to find out given year is a leap year or not?

```
package com.ihub.www;
import java.util.Scanner;
class LeapYear
{
    //asking inputs
    Scanner sc=new Scanner(System.in);
    System.out.println("Enter the Year :");
    int year = sc.nextInt();
    //logic
    If((year%4==0 && year%100 != 0) || (year%400==0))
        System.out.println("It is leap number");
    else
        System.out.println("It is not number");
}
```

Inputs:

Enter the Number: 2024

Output:

It is a leap year

6. Write a java program to find out given alphabet is a vowel or consonant?

```
package com.ihub.www;
import java.util.Scanner;
class VowelOrNot
{
    //asking inputs
    Scanner sc=new Scanner(System.in);
    System.out.println("Enter the Alphabet :");
    char ch = sc.next().charAt(0);
    //logic
    If(ch=='a' || ch=='e' || ch=='i' || ch=='o' || ch=='u')
        System.out.println("It is a vowel");
    else
        System.out.println("It is not a vowel");
}
```

Inputs:

Enter the Alphabet: a

Output:

It is a vowel

7. Write a java program to find out given number is positive or negative?

```
package com.ihub.www;
import java.util.Scanner;
class PositiveOrNegative
{
    //asking inputs
    Scanner sc=new Scanner(System.in);
    System.out.println("Enter the Number :");
    int n = sc.nextInt();
    //logic
    If(n!=0)
    {
        if(n>0)
        {
            System.out.println("It is positive number");
            System.exit(0);
        }
        System.out.println("It is negative number");
    }
}
```

Inputs:

Enter the Number: 10

Output:

It is a positive number

8. Write a java program to find out given alphabet is a uppercase letter, lowercase letter, digit or special symbol?

```
package com.ihub.www;
import java.util.Scanner;
class FindOutAlphabet
{
    //asking inputs
    Scanner sc=new Scanner(System.in);
    System.out.println("Enter the Alphabet :");
    char ch = sc.next().charAt(0);
    //logic
    If(ch>='A' && ch<='z')
        System.out.println("It is uppercase letter");
    else if(ch>='a' && ch<='z')
        System.out.println("It is lowercase letter");
    else if(ch>='0' && ch<='9')
        System.out.println("It is Digit");
    else
        System.out.println("It is special symbol");
}
```

Inputs:

Enter the Alphabet: L

Output:

It is uppercase letter

9. Write a java program to how to call garbage collector in java?

```
package com.ihub.www;
class GarbageCollector
{
    public static void main(String[] args)
    {
        GarbageCollector gc1=new GarbageCollector();
        GarbageCollector gc2=new GarbageCollector();
        //initialize null to make eligible for gc
        gc1=null;
        gc2=null;
        System.gc();
        //Runtime.getRuntime().gc();
    }
    public void finalize()
    {
        System.out.println("garbage collector called");
    }
}
Output:
garbage collector called
```

10. Write a java program to generate random number in java?

```
package com.ihub.www;
import java.util.Random;
class RandomNumber
{
    public static void main(String[] args)
    {
        Random r=new Random();
        //it will generate the number between 0 to 99
        int random_num=r.nextInt(100);
        System.out.println(random_num);
        //System.out.println(Math.random());
    }
}
Output:
(Any random number will come here)
```

11. How can we execute java program without main method?

```
package com.ihub.www;
class ProgramWithoutMain
{
    //static block
    static
    {
        System.out.println("Hello World");
        System.exit(0);
    }
}
```

Output

After Java 7, this code will not execute.

12. How to use static import in java?

```
package com.ihub.www;
import static java.lang.System.*;
class StaticImport
{
    out.println("stmt1");
    exit(0);
    out.println("stmt2");
}
```

Output:

stmt1

13. Write a java program to find out product of two numbers?

```
package com.ihub.www;
import java.util.Scanner;
class ProductOfTwo
{
    Scanner sc = new Scanner(System.in);
    System.out.println("Enter the First Number :");
    int a = sc.nextInt();
    System.out.println("Enter the Second Number :");
    int b = sc.nextInt();
    //logic
    int product= a * b;
    System.out.println("The product of "+a+" and "+b+" is "+c);
}
```

Input:

6
4

Output:

The product of 6 and 4 is 24

While loop

14. Write a java program to find out sum of digits of a given number?

```
package com.ihub.www;
class SumOfDigits
{
    public static void main(String[] args)
    {
        //asking inputs
        Scanner sc = new Scanner(System.in);
        System.out.println("Enter the Number :");
        int n = sc.nextInt();

        //sum of digits logic
        int rem=0,sum=0;
        while(n>0)
        {
            rem = n % 10;
            sum = sum + rem;
            n = n / 10;
        }
        System.out.println("Sum of digits of a given number is =" +sum);
    }
}
```

Input:

123

Output:

Sum of digits of a given number is = 6

Input:

462

Output:

Sum of digits of a given number is = 11

15. Write a java program to find out given number is Armstrong or not?

```
package com.ihub.www;
class ArmstrongOrNot
{
    public static void main(String[] args)
    {
        //asking inputs
        Scanner sc = new Scanner(System.in);
        System.out.println("Enter the Number :");
        int n = sc.nextInt();
        int temp = n;

        //Armstrong logic
        int rem=0,sum=0;
        while(n>0)
        {
            rem = n % 10;
            sum = sum + rem * rem * rem;
            n = n / 10;
        }
        If(temp==sum)
            System.out.println("It is an Armstrong number");
        else
            System.out.println("It is not an Armstrong number");
    }
}
```

Input:

121

Output:

It is an Armstrong number

Input:

123

Output:

It is not an Armstrong number

16. Write a java program to display reverse of a given number?

```
package com.ihub.www;
class SumOfDigits
{
    public static void main(String[] args)
    {
        //asking inputs
        Scanner sc = new Scanner(System.in);
        System.out.println("Enter the Number :");
        int n = sc.nextInt();

        //reverse logic
        int rem=0,rev=0;
        while(n>0)
        {
            rem = n % 10;
            rev = rev*10 + rem;
            n = n / 10;
        }
        System.out.println("Reverse of a given number is =" +rev);
    }
}
```

Input:
123

Output:
Reverse of a given number is = 321

Input:
784

Output:
Reverse of a given number is = 487

17. Write a java program to find out given number is palindrome or not?

```
package com.ihub.www;
class PalindromeOrNot
{
    public static void main(String[] args)
    {
        //asking inputs
        Scanner sc = new Scanner(System.in);
        System.out.println("Enter the Number :");
        int n = sc.nextInt();

        int temp = n;

        //Palindrome logic
        int rem=0,rev=0;
        while(n>0)
        {
            rem = n % 10;
            rev = rev * 10 + rem;
            n = n / 10;
        }
        If(temp==rev)
            System.out.println("It is palindrome number");
        else
            System.out.println("It is not a palindrome number");
    }
}
```

Input:
121

Output:
It is palindrome number

Input:
123

Output:
It is not a palindrome number

18. Write a java program to find out LCM (Least Common Multiple) of Two numbers?

```
package com.ihub.www;
import java.util.Scanner;
class Test
{
    public static void main(String[] args)
    {
        Scanner sc=new Scanner(System.in);
        System.out.println("Enter the First Number :");
        int num1=sc.nextInt();
        System.out.println("Enter the Second Number :");
        int num2=sc.nextInt();
        int lcm=(num1>num2)?num1:num2;
        while(true)
        {
            if(lcm%num1==0 && lcm%num2==0)
            {
                System.out.println("LCM of two numbers is =" +lcm);
                break;
            }
            ++lcm;
        }
    }
}
```

Input:

```
Enter the First Number: 10
Enter the Second Number: 25
```

Output:

```
LCM of two numbers is = 50
```

Input:

```
Enter the First Number: 10
Enter the Second Number: 20
```

Output:

```
LCM of two numbers is = 20
```

19. Write a java program to display reverse of a given number in words?

```
package com.ihub.www;
class SumOfDigits
{
    public static void main(String[] args)
    {
        //asking inputs
        Scanner sc = new Scanner(System.in);
        System.out.println("Enter the Number :");
        int n = sc.nextInt();

        //reverse logic
        while(n>0)
        {
            switch( n % 10 )
            {
                case 0 : System.out.println("Zero");
                case 1 : System.out.println("One");
                case 2 : System.out.println("Two");
                case 3 : System.out.println("Three");
                case 4 : System.out.println("Four");
                case 5 : System.out.println("Five");
                case 6 : System.out.println("Six");
                case 7 : System.out.println("Seven");
                case 8 : System.out.println("Eight");
                case 9 : System.out.println("Nine");
            }
            n = n / 10;
        }
    }
}
```

Input:

123

Output:

ThreeTwoOne

Input:

784

Output:

FourEightSeven

For loop

20. Write a java program to display 10 natural numbers?

```
package com.ihub.www;
class NaturalNumbers
{
    public static void main(String[] args)
    {
        for(int i=1;i<=10;i++)
        {
            System.out.print(i+" ");
        }
    }
}
```

Output:

1 2 3 4 5 6 7 8 9 10

21. Write a java program to perform sum of 10 natural numbers?

```
package com.ihub.www;
class SumOfNatural
{
    public static void main(String[] args)
    {
        int sum = 0;
        for(int i=1;i<=10;i++)
        {
            sum+=i;
        }
        System.out.println("sum of 10 natural numbers is =" +sum);
    }
}
```

Output:

55

22. Write a java program to display number of even and odd numbers from 1 to 10?

```
package com.ihub.www;
class SumOfNatural
{
    public static void main(String[] args)
    {
        int even = 0, odd = 0;
        for(int i=1;i<=10;i++)
        {
            if(i%2==0)
                even++;
            else
                odd++;
        }
        System.out.println("No of even numbers are =" +even);
        System.out.println("No of odd numbers are =" +odd);
    }
}
```

Output:

```
No of even numbers are = 5
No of odd numbers are = 5
```

23. Write a java program to find out factorial of a given number?

```
package com.ihub.www;
import java.util.Scanner;
class FactorialApp
{
    public static void main(String[] args)
    {
        Scanner sc = new Scanner(System.in);
        System.out.println("Enter the number :");
        int n = sc.nextInt();
        int fact=1;
        for(int i=n;i>=1;i--)
        {
            fact *= i;
        }
        System.out.println("Factorial of a given number is =" +fact);
    }
}
```

Input:

```
Enter the Number: 5
```

Output:

```
Factorial of a give number is = 120
```

24. Write a java program to check given number is prime or not?

```
package com.ihub.www;
import java.util.Scanner;
class PrimeNumber
{
    public static void main(String[] args)
    {
        Scanner sc=new Scanner(System.in);
        System.out.println("Enter the number :");
        int n=sc.nextInt();
        boolean flag=true;
        for(int i=2;i<=n/2;i++)
        {
            if(n%i==0)
            {
                flag=false;
                break;
            }
        }
        if(flag==true)
            System.out.println("It is prime number");
        else
            System.out.println("It is not prime number");
    }
}
```

Input:

Enter the number: 5

Output:

It is a prime number

Input:

Enter the number: 5

Output:

It is a prime number

25. Write a java program to display prime numbers from 1 to 100?

```
package com.ihub.www;
class Test
{
    public static void main(String[] args)
    {
        for(int n=2;n<=100;n++)
        {
            boolean flag=true;
            for(int i=2;i<=n/2;i++)
            {
                if(n%i==0)
                {
                    flag=false;
                    break;
                }
            }
            if(flag==true)
                System.out.print(n+" ");
        }
    }
}
```

Output:

```
1 2 3 5 7 11 13 17 19 23 29 31 37 41 43 47 53 59 61 67 71 73 79 83 89 97
```

26. Write a java program to find out GCD of two numbers?

```
package com.ihub.www;
class GCDApp
{
    public static void main(String[] args)
    {
        int a=12,b=18,gcd=0;

        for(int i=1;i<=12 && i<=18;i++)
        {
            if((a%i==0) && (b%i==0))
            {
                gcd=i;
            }
        }
        System.out.println("GCD of "+a+" and "+b+" is =" +gcd);
    }
}
```

Output:

```
GCD of 12 and 18 is = 6
```

27. Write a java program to check given number is perfect or not?

```
package com.ihub.www;
import java.util.Scanner;
class PerfectNumber
{
    public static void main(String[] args)
    {
        Scanner sc=new Scanner(System.in);
        System.out.println("Enter the number :");
        int n=sc.nextInt();
        int sum=0;
        for(int i=1;i<n;i++)
        {
            if(n%i==0)
            {
                sum+=i;
            }
        }
        if(sum==n)
            System.out.println("It is a perfect number");
        else
            System.out.println("IT is not a perfect number");
    }
}
```

Input:

Enter the number: 6

Output:

It is a perfect number

28. Write a java program to display Fibonacci series of a given number?

```
package com.ihub.www;
import java.util.Scanner;
class Test
{
    public static void main(String[] args)
    {
        Scanner sc=new Scanner(System.in);
        System.out.println("Enter the number :");
        int n=sc.nextInt();
        int a=0,b=1,c;
        System.out.print(a+" "+b+" ");
        for(int i=1;i<=n;i++)
        {
            c=a+b;
            System.out.print(c+" ");
            a=b;
            b=c;
        }
    }
}
```

Input:

Enter the number: 5

Output:

0 1 1 2 3 5 8

Loop Patterns

29. Write a java program to display below loop pattern?

```
* * * *
* * * *
* * * *
* * * *

package com.ihub.www;
class LoopPattern
{
    public static void main(String[] args)
    {
        //rows
        for(int i=1;i<=4;i++)
        {
            //cols
            for(int j=1;j<=4;j++)
            {
                System.out.print("* ");
            }
            //new line
            System.out.println();
        }
    }
}
```

30. Write a java program to display below loop pattern?

```
*      *
*      *
*
*
*      *
*      *

package com.ihub.www;
class LoopPattern
{
    public static void main(String[] args)
    {
        //rows
        for(int i=1;i<=5;i++)
        {
            //cols
            for(int j=1;j<=5;j++)
            {
                if(i==j || i+j==6)
                    System.out.print("* ");
                else
                    System.out.print(" ");
            }
            //new line
            System.out.println();
        }
    }
}
```

31. Write a java program to display below loop pattern?

```
*  
* *  
* * *  
* * * *  
  
package com.ihub.www;  
class LoopPattern  
{  
    public static void main(String[] args)  
    {  
        //rows  
        for(int i=1;i<=4;i++)  
        {  
            //cols  
            for(int j=1;j<=i;j++)  
            {  
                System.out.print("* ");  
            }  
            //new line  
            System.out.println();  
        }  
    }  
}
```

32. Write a java program to display below loop pattern?

```
1  
2 3  
4 5 6  
7 8 9 0
```

```
package com.ihub.www;  
class Test  
{  
    public static void main(String[] args)  
    {  
        int k = 1;  
        //rows  
        for(int i=1;i<=4;i++)  
        {  
            //cols  
            for(int j=1;j<=i;j++)  
            {  
                if(k<=9)  
                    System.out.print(k++ + " ");  
                else  
                    System.out.print("0 ");  
            }  
            //new line  
            System.out.println();  
        }  
    }  
}
```

33. Write a java program to display below loop pattern?

```
*  
* *  
* * *  
* * * *  
  
package com.ihub.www;  
class LoopPattern  
{  
    public static void main(String[] args)  
    {  
        //rows  
        for(int i=1;i<=4;i++)  
        {  
            //space  
            for(int j=4;j>i;j--)  
            {  
                System.out.print(" ");  
            }  
            //right side elements  
            for(int j=1;j<=i;j++)  
            {  
                System.out.print(i+" ");  
            }  
            //new line  
            System.out.println();  
        }  
    }  
}
```

34. Write a java program to display below loop pattern?

```
2  
4 6  
8 10 12  
14 16 18 20
```

```
package com.ihub.www;  
class LoopPattern  
{  
    public static void main(String[] args)  
    {  
        int even=2;  
        //rows  
        for (int i = 1; i <= 4; i++)  
        {  
            //cols  
            for (int j = 1; j <= i; j++)  
            {  
                System.out.print(evenNumber + " ");  
                even += 2;  
            }  
            //new line  
            System.out.println();  
        }  
    }  
}
```

35. Write a java program to display below loop pattern?

```
2
3 5
7 11 13
17 19 23 29

package com.ihub.www;
class LoopPattern
{
    public static void main(String[] args)
    {
        int num=2;
        //rows
        for(int i=1;i<=4;i++)
        {
            //cols
            for(int j=1;j<=i;j++)
            {
                while(true)
                {
                    boolean flag=true;

                    for(int k=2;k<=num/2;k++)
                    {
                        if(num%k==0)
                        {
                            flag=false;
                            break;
                        }
                    }
                    if(flag)
                    {
                        System.out.print(num+" ");
                        num++;
                        break;
                    }
                    num++;
                }
            }
            //new line
            System.out.println();
        }
    }
}
```

36. Write a java program to display below loop pattern?

```
*  
* * *  
* * * * *  
* * * * * *  
  
package com.ihub.www;  
class LoopPattern  
{  
    public static void main(String[] args)  
    {  
        //rows  
        for(int i=1;i<=4;i++)  
        {  
            //space  
            for(int j=4;j>i;j--)  
            {  
                System.out.print(" ");  
            }  
            //left side elements  
            for(int j=1;j<=i;j++)  
            {  
                System.out.print(j+" ");  
            }  
            //right side elements  
            for(int j=i-1;j>=1;j--)  
            {  
                System.out.print(j+" ");  
            }  
            //new line  
            System.out.println();  
        }  
    }  
}
```

37. Write a java program to display below loop pattern?

```
1      1
1 2    2 1
1 2 3  3 2 1
1 2 3 4 4 3 2 1
```

```
package com.ihub.www;
class LoopPattern
{
    public static void main(String[] args)
    {
        int rows=4;

        for(int i=1;i<=rows;i++)
        {
            //left side elements
            for(int j=1;j<=i;j++)
            {
                System.out.print(j+" ");
            }
            //space
            for(int j=1;j<=(rows-i)*2;j++)
            {
                System.out.print(" ");
            }
            //right
            for(int j=i;j>=1;j--)
            {
                System.out.print(j+" ");
            }

            //new line
            System.out.println();
        }
    }
}
```

38. Write a java program to display below loop pattern?

```
*  
*  
* * * * *  
*  
*  
  
package com.ihub.www;  
class LoopPattern  
{  
    public static void main(String[] args)  
    {  
        //rows  
        for(int i=1;i<=5;i++)  
        {  
            //cols  
            for(int j=1;j<=5;j++)  
            {  
                if(i==3 || j==3)  
                {  
                    System.out.print("* ");  
                }  
                else  
                {  
                    System.out.print(" ");  
                }  
            }  
            //new line  
            System.out.println();  
        }  
    }  
}
```

Recursion

39. Write a java program to find out factorial of a given number using recursion?

```
package com.ihub.www;
import java.util.Scanner;
class FactorialApp
{
    public static void main(String[] args)
    {
        Scanner sc=new Scanner(System.in);
        System.out.println("Enter the number :");
        int n=sc.nextInt();
        //caller method
        System.out.println("Factorial of a given number is =" +fact(n));
    }
    //callie method
    public static int fact(int n)
    {
        if(n<0)
            return -1;
        if(n==0)
            return 1;

        return n*fact(n-1);
    }
}
```

Input:

Enter the Number: 5

Output:

Factorial of a given number is = 120

40. Write a java program to find out N-th element of Fibonacci series?

```
package com.ihub.www;
import java.util.Scanner;
class FibonaccieOfNthEle
{
    public static void main(String[] args)
    {
        Scanner sc=new Scanner(System.in);
        System.out.println("Enter the number :");
        int n=sc.nextInt();
        //caller method
        System.out.println(fib(n));
    }
    //callie method
    public static int fib(int n)
    {
        if(n == 0 || n==1)
            return 0;
        else if(n==2)
            return 1;
        else
            return fib(n-1)+fib(n-2);
    }
}
```

Input:

Enter the Number: 4

Output:

2

Arrays

41. Write a java program to sum of array elements?

Input:

4 7 1 3 9 6

Output:

30

```
package com.ihub.www;
class SumOfArray
{
    public static void main(String[] args)
    {
        int[] arr={4,7,1,3,9,6};

        //for each loop
        int sum=0;
        for(int i:arr)
        {
            sum+=i;
        }
        System.out.println(sum);
    }
}
```

42. Write a java program to display even elements from positive integer array?

Input:

4 7 1 3 2 9 6

Output:

4 2 6

```
package com.ihub.www;
class ArrayEvenElements
{
    public static void main(String[] args)
    {
        int[] arr={4,7,1,3,2,9,6};

        //for each loop
        for(int i:arr)
        {
            if(i%2==0)
            {
                System.out.print(i+" ");
            }
        }
    }
}
```

43. Write a java program to display array elements in sorting order without using sort method?

Input:

4 7 1 3 9 6

Output:

1 3 4 6 7 9

```
package com.ihub.www;
class ArraySorting
{
    public static void main(String[] args)
    {
        int[] arr={4,7,1,3,9,6};
        //ascending logic
        for(int i=0;i<arr.length;i++)
        {
            for(int j=0;j<arr.length;j++)
            {
                if(arr[i]<arr[j])
                {
                    int temp=arr[i];
                    arr[i]=arr[j];
                    arr[j]=temp;
                }
            }
        }
        //reading the elements
        for(int i:arr)
        {
            System.out.print(i+" ");
        }
    }
}
```

44. Write a java program to find out three highest elements from given positive integer array?

Input:

6 9 2 3 1 7 8 4 5

Output:

9 8 7

```
package com.ihub.www;
class ThreeHighestElements
{
    public static void main(String[] args)
    {
        int[] arr={6,9,2,3,1,7,8,4,5};
        int firstHighest=Integer.MIN_VALUE;
        int secondHighest=Integer.MIN_VALUE;
        int thirdHighest=Integer.MIN_VALUE;
        for(int i:arr)
        {
            if(i>firstHighest)
            {
                thirdHighest=secondHighest;
                secondHighest=firstHighest;
                firstHighest=i;
            }
            else if(i<firstHighest && i>secondHighest)
            {
                thirdHighest=secondHighest;
                secondHighest=i;
            }
        }
        System.out.println(firstHighest+ " "+secondHighest+ " "+thirdHighest);
    }
}
```

45. Write a java program to display duplicate elements from given array?

Input:

5 7 3 2 1 9 3 5 7 4

Output:

5 7 3

```
package com.ihub.www;
class DuplicateElements
{
    public static void main(String[] args)
    {
        int[] arr={5,7,3,2,1,9,3,5,7,4};
        //duplicates
        for(int i=0;i<arr.length;i++)
        {
            for(int j=i+1;j<arr.length;j++)
            {
                if(arr[i]==arr[j])
                    System.out.print(arr[i]+" ");
            }
        }
    }
}
```

46. Write a java program to display unique elements from given array?

Input:

5 7 3 2 1 9 3 5 7 4

Output:

2 1 9 4

```
package com.ihub.www;
class UniqueElements
{
    public static void main(String[] args)
    {
        int[] arr={5,7,3,2,1,9,3,5,7,4};
        //unique elments
        for(int i=0;i<arr.length;i++)
        {
            int cnt=0;
            for(int j=0;j<arr.length;j++)
            {
                if(arr[i]==arr[j])
                {
                    cnt++;
                }
            }
            if(cnt==1)
                System.out.print(arr[i]+" ");
        }
    }
}
```

47. Write a java program to display prime elements from given array?

Input:

12 5 7 9 6 11 17 4

Output:

5 7 11 17

```
package com.ihub.www;
class PrimeElements
{
    public static void main(String[] args)
    {
        int[] arr={12,5,7,9,6,11,17,4};
        for(int n:arr)
        {
            boolean flag=true;
            for(int i=2;i<=n/2;i++)
            {
                if(n%i==0)
                {
                    flag=false;
                    break;
                }
            }
            if(flag==true)
                System.out.print(n+" ");
        }
    }
}
```

48. Write a java program to display sum of two array elements?

Input:

```
arr1 = 2 5 7 9 6  
arr2 = 9 3 5 4 2
```

Output:

```
11 8 12 13 8
```

```
package com.ihub.www;  
class SumOfTwoArrays  
{  
    public static void main(String[] args)  
    {  
        int[] arr1 ={2,5,7,9,6};  
        int[] arr2 ={9,3,5,4,2};  
        int[] resArr=new int[arr1.length];  
        for(int i=0;i<arr1.length && i<arr2.length;i++)  
        {  
            resArr[i]=arr1[i]+arr2[i];  
        }  
        //display the elements  
        for(int i:resArr)  
        {  
            System.out.print(i+" ");  
        }  
    }  
}
```

49. Write a java program to concatenate two arrays and display them in sorting order?

Input:

```
arr1 = 1 5 3 4 2  
arr2 = 9 7 6 8 10
```

Output:

```
1 2 3 4 5 6 7 8 9 10
```

```
package com.ihub.www;  
import java.util.Arrays;  
class ConcatinateTwoArrays  
{  
    public static void main(String[] args)  
    {  
        int[] arr1 ={1,5,3,4,2};  
        int[] arr2 ={9,7,6,8,10};  
        int size1=arr1.length;  
        int size2=arr2.length;  
        arr1=Arrays.copyOf(arr1,size1+size2);  
        int j=0;  
        for(int i=size1;i<arr1.length;i++)  
        {  
            arr1[i]=arr2[j++];  
        }  
        Arrays.sort(arr1);  
        //display  
        for(int i:arr1)  
        {  
            System.out.print(i+" ");  
        }  
    }  
}
```

50. Write a java program to find out most repeating element from given array?

Input:

2 6 5 9 1 2 6 7 6 5 5 9 1 5

Output:

5 is repeating for 4 times

```
package com.ihub.www;
class MostRepeatingElement
{
    public static void main(String[] args)
    {
        int[] arr={2,6,5,9,1,2,6,7,6,5,5,9,1,5};

        int element=0;
        int maxCount=0;

        for(int i=0;i<arr.length;i++)
        {
            int cnt=0;

            for(int j=0;j<arr.length;j++)
            {
                if(arr[i]==arr[j])
                {
                    cnt++;
                }
                if(maxCount<cnt)
                {
                    maxCount=cnt;
                    element=arr[i];
                }
            }
            System.out.println(element+" is repeating for "+maxCount+" times" );
        }
    }
}
```

51. Write a java program to find out the pairs whose sum is equals to given number?

Input:

```
arr = 4 6 2 8 7 3 9 1  
sum = 10
```

Output:

```
4 6  
2 8  
7 3  
9 1
```

```
package com.ihub.www;  
class Test  
{  
    public static void main(String[] args)  
    {  
        int[] arr={4,6,2,8,7,3,9,1};  
        int sum=10;  
  
        for(int i=0;i<arr.length;i++)  
        {  
            for(int j=i+1;j<arr.length;j++)  
            {  
                if(arr[i]+arr[j]==sum)  
                {  
                    System.out.println(arr[i]+" "+arr[j]);  
                }  
            }  
        }  
    }  
}
```

52. Write a java program to find out triplets whose sum of equals to given number?

Input:

```
arr = 4 6 2 8 7 3 9 1  
sum = 10
```

Output:

```
6 3 1  
2 7 1
```

```
package com.ihub.www;  
class TripletElements  
{  
    public static void main(String[] args)  
    {  
        int[] arr={4,6,2,8,7,3,9,1};  
        int sum=10;  
  
        for(int i=0;i<arr.length;i++)  
        {  
            for(int j=i+1;j<arr.length;j++)  
            {  
                for(int k=j+1;k<arr.length;k++)  
                {  
                    if(arr[i]+arr[j]+arr[k]==sum)  
                    {  
                        System.out.println(arr[i]+" "+arr[j]+" "+arr[k]);  
                    }  
                }  
            }  
        }  
    }  
}
```

53. Write a java program to display array elements in spiral form?

Input:

```
1 2 3  
4 5 6  
7 8 9
```

Output:

```
1 2 3 6 9 8 7 4 5
```

```
package com.ihub.www;  
class SpiralForm  
{  
    public static void main(String[] args)  
    {  
        int[][] matrix = {  
            {1, 2, 3},  
            {4, 5, 6},  
            {7, 8, 9}  
        };  
  
        int rows = matrix.length;  
        int cols = matrix[0].length;  
  
        int top = 0;  
        int bottom = rows - 1;  
        int left = 0;  
        int right = cols - 1;  
  
        while (true)  
        {  
            if (left > right)  
            {  
                break;  
            }  
  
            // Print top row  
            for (int i = left; i <= right; i++)  
            {  
                System.out.print(matrix[top][i] + " ");  
            }  
            top++;  
  
            if (top > bottom)  
            {  
                break;  
            }  
  
            // Print right column  
            for (int i = top; i <= bottom; i++)  
            {  
                System.out.print(matrix[i][right] + " ");  
            }  
            right--;
```

```
if (left > right)
{
    break;
}

// Print bottom row
for (int i = right; i >= left; i--)
{
    System.out.print(matrix[bottom][i] + " ");
}
bottom--;

if (top > bottom)
{
    break;
}

// Print left column
for (int i = bottom; i >= top; i--)
{
    System.out.print(matrix[i][left] + " ");
}
left++;

}//while loop
}
```

OOPS

54. Write a java program on encapsulation?

```
class Student
{
    private int studId;
    private String studName;
    private double studFee;

    //setter methods
    public void setStudId(int studId)
    {
        this.studId=studId;
    }
    public void setStudName(String studName)
    {
        this.studName=studName;
    }
    public void setStudFee(double studFee)
    {
        this.studFee=studFee;
    }

    //getter methods
    public int getStudId()
    {
        return studId;
    }
    public String getStudName()
    {
        return studName;
    }
    public double getStudFee()
    {
        return studFee;
    }
}
class EncapsulationApp
{
    public static void main(String[] args)
    {
        Student s=new Student();
        s.setStudId(101);
        s.setStudName("Alan");
        s.setStudFee(1000d);

        System.out.println("Student Id :" +s.getStudId());
        System.out.println("Student Name :" +s.getStudName());
        System.out.println("Student Fee :" +s.getStudFee());
    }
}
```

55. Write a java program on singleton class?

```
class Singleton
{
    static Singleton singleton=null;

    private Singleton()
    {
    }

    public static Singleton getInstance()
    {
        if(singleton==null)
        {
            singleton=new Singleton();
        }
        return singleton;
    }
}

class MainApp
{
    public static void main(String[] args)
    {
        Singleton s1=Singleton.getInstance();
        Singleton s2=Singleton.getInstance();

        System.out.println(s1.hashCode());
        System.out.println(s2.hashCode());
    }
}
```

56. Write a java program on method overloading?

```
class MeeSeva
{
    //overloaded methods
    public void search(int voterIdNo)
    {
        System.out.println("Voter Details Found via voterIdNo");
    }
    public void search(String houseNo)
    {
        System.out.println("Voter Details Found via houseNo");
    }
    public void search(long aadharCardNo)
    {
        System.out.println("Voter Details Found via aadharCardNo");
    }
}
class OverloadingApp
{
    public static void main(String[] args)
    {
        MeeSeva ms=new MeeSeva();
        ms.search(101);
        ms.search("1-4-7/5/A");
        ms.search(10001L);
    }
}
```

57. Write a java program on method overriding?

```
class Parent
{
    public void property()
    {
        System.out.println("Cash+Gold+Land");
    }
    //overridden methods
    public void marry()
    {
        System.out.println("Subhalakshmi");
    }
}
class Child extends Parent
{
    //overriding methods
    public void marry()
    {
        System.out.println("Rashmika");
    }
}
class OverridingApp
{
    public static void main(String[] args)
    {
        Parent p=new Parent();
        p.property(); // cash+gold+land
        p.marry(); // subhalakshmi

        Child c=new Child();
        c.property(); // cash+gold+land
        c.marry(); // Rashmika

        Parent p1=new Child();
        p1.property(); //cash+gold+land
        p1.marry(); // Rashmika
    }
}
```

58. Write a java program on inheritance?

```
class Parent
{
    public void m1()
    {
        System.out.println("Parent-M1 Method");
    }
}
class Child extends Parent
{
    public void m2()
    {
        System.out.println("Child-M2 Method");
    }
}
class InheritanceApp
{
    public static void main(String[] args)
    {
        Parent p=new Parent();
        p.m1();

        Child c=new Child();
        c.m1();
        c.m2();

        Parent p1=new Child();
        p1.m1();

        Child c1=new Parent(); //invalid
    }
}
```

59. Write a java program for interface?

```
interface A
{
    public abstract void m1();
}
class B implements A
{
    public void m1()
    {
        System.out.println("M1-Method");
    }
}
class InterfaceApp
{
    public static void main(String[] args)
    {
        A a=new B();
        a.m1();
    }
}
```

Or

```
interface A
{
    public abstract void m1();
}

class InterfaceApp
{
    public static void main(String[] args)
    {
        A a=new A()
        {
            public void m1()
            {
                System.out.println("From M1 Method");
            }
        };
        a.m1();
    }
}
```

60. Write a java program on constructor?

```
class Employee
{
    //current class variables
    private int empld;
    private String empName;
    private double empSal;

    public Employee(int empld, String empName, double empSal)
    {
        this.empld=empld;
        this.empName=empName;
        this.empSal=empSal;
    }

    public void getEmployeeDetails()
    {
        System.out.println("Employee Id :" + empld);
        System.out.println("Employee Name :" + empName);
        System.out.println("Employee Salary :" + empSal);
    }
}

class ConstructorApp
{
    public static void main(String[] args)
    {
        Employee e=new Employee(101, "Alan", 1000d);
        e.getEmployeeDetails();
    }
}
```

61. Write a java program to perform sum of two binary numbers?

```
import java.util.Scanner;
class TwoBinaryNumber
{
    public static void main(String[] args)
    {
        Scanner sc=new Scanner(System.in);

        System.out.println("Enter the first binary number :");
        String binary1=sc.next();

        System.out.println("Enter the second binary number :");
        String binary2=sc.next();

        //converting binary to decimal
        int a=Integer.parseInt(binary1,2);
        int b=Integer.parseInt(binary2,2);

        //logic
        int c=a+b;

        //converting decimal to binary
        String result=Integer.toBinaryString(c);
        System.out.println(result);
    }
}
```

Strings

62. Write a java program to display the string in reverse order?

Input:

hello

Output:

olleh

```
class ReverseString
{
    public static void main(String[] args)
    {
        String str="hello";
        char[] carr=str.toCharArray(); // h   e   l   l   o

        String rev="";
        for(int i=carr.length-1;i>=0;i--)
        {
            rev+=carr[i];
        }

        System.out.println(rev);
    }
}
```

63. Write a java program to display reverse of a sentence?

Input:

This Is Java Class

Output:

Class Java Is This

```
class ReverseString
{
    public static void main(String[] args)
    {
        String str="This Is Java Class";
        String[] sarr=str.split(" "); //This   Is   Java   Class

        String rev="";
        for(int i=sarr.length-1;i>=0;i--)
        {
            rev+=sarr[i]+" ";
        }

        System.out.println(rev);
    }
}
```

64. Write a java program to display reverse of a word in a given string?

Input:

This Is Java Class

Output:

sihT sl avaJ ssalC

```
class Test
{
    public static void main(String[] args)
    {
        String str="This Is Java Class";

        String[] sarr=str.split(" "); //This Is Java Class

        String rev="";
        for(String s:sarr)
        {
            char[] carr=s.toCharArray(); // T h i s

            //reading reverse
            for(int i=carr.length-1;i>=0;i--)
            {
                rev+=carr[i];
            }
            //add the space
            rev+=" ";
        }
        System.out.println(rev);
    }
}
```

65. Write a java program to check given string is palindrome or not?

Input:

racar

Output:

It is a palindrome string

```
package com.ihub.www;
class PalindromeApp
{
    public static void main(String[] args)
    {
        String str="racar";

        char[] carr=str.toCharArray();

        String rev="";

        for(int i=carr.length-1;i>=0;i--)
        {
            rev+=carr[i];
        }

        if(str.equals(rev))
            System.out.println("It is palindrome string");
        else
            System.out.println("It is not palindrome string");
    }
}
```

66. Write a java program to display permutation of given string?

Input:

ABC

Output:

ABC

ACB

BAC

BCA

CBA

CAB

```
class PermutationApp
{
    public static void main(String[] args)
    {
        String str="ABC";

        permutation(str.toCharArray(),0);
    }

    public static void permutation(char[] arr,int fi)
    {
        if(fi==arr.length-1)
        {
            System.out.println(arr);
            return;
        }

        for(int i=fi;i<arr.length;i++)
        {
            swap(arr,i,fi);
            permutation(arr,fi+1);
            swap(arr,i,fi);
        }
    }

    public static void swap(char[] carr,int i,int fi)
    {
        char temp=carr[i];
        carr[i]=carr[fi];
        carr[fi]=temp;
    }
}
```

67. Write a java program to display given string in below format?

Input:

A1B2C3D4

Output:

ABBCCDDDD

```
class StringFormatAp
{
    public static void main(String[] args)
    {
        String str="A1B2C3D4";

        for(int i=0;i<str.length();i++)
        {
            if(Character.isAlphabetic(str.charAt(i)))
            {
                System.out.print(str.charAt(i)); //
            }
            else
            {
                int k=Character.getNumericValue(str.charAt(i));

                for(int j=1;j<k;j++)
                {
                    System.out.print(str.charAt(i-1));
                }
            }
        }
    }
}
```

68. Write a java program to display duplicate and unique characters from given string?

Input:

google

Output:

Duplicate Characters : og
Unique Characters : gole

```
class DuplicateCharacters
{
    public static void main(String[] args)
    {
        String str="google";

        String duplicates="";
        String uniques="";

        for(int i=0;i<str.length();i++)
        {
            String current=Character.toString(str.charAt(i));

            if(uniques.contains(current))
            {
                if(!duplicates.contains(current))
                {
                    duplicates+=current;
                    continue;
                }
            }
            uniques+=current;
        }
        System.out.println("Duplicate Characters :" + duplicates);
        System.out.println("Unique Characters :" + uniques);
    }
}
```

69. Write a java program to find out largest/longest common subsequence in two given strings?

```
package com.ihub.www;
class LargestCommonSubsequence
{
    public static void main(String[] args)
    {
        String firstStr="ABCAB";
        String secondStr="AECKB";

        //caller
        System.out.println(longestCommonSubsequence(firstStr,secondStr));
    }
    public static int longestCommonSubsequence(String s1,String s2)
    {
        return solve(s1,s2,0,0);
    }
    public static int solve(String str1,String str2,int i,int j)
    {
        if(i==str1.length())
            return 0;
        if(j==str2.length())
            return 0;

        int ans=0;
        if(str1.charAt(i)==str2.charAt(j))
        {
            ans=1+solve(str1,str2,i+1,j+1);
        }
        else
        {
            ans=Math.max(solve(str1,str2,i+1,j),solve(str1,str2,i,j+1));
        }

        return ans;
    }
}
```

Input:

ABCAB
AECKB

Output:

3

70. Write a java program to perform right rotation of a given string?

Input:

ihubtalent

count : 2

Output:

ntihubtale

```
package com.ihub.www;
public class RightRotation
{
    public static void main(String[] args)
    {
        String str="ihubtalent";

        int count=2;

        //System.out.println(str.substring(str.length()-count,str.length()));// nt
        //System.out.println(str.substring(0,str.length()-count));// ihubtale

        //right to left rotation
        str=str.substring(str.length()-count,str.length())+str.substring(0,str.length()-count);

        System.out.println(str);
    }
}
```

71. Write a java program to perform left rotation of a given string?

Input:

ihubtalent

no of characters : 2

Output:

ubtalentih

```
package com.ihub.www;
public class TEst
{
    public static void main(String[] args)
    {
        String str="ihubtalent";

        int count=2;

        //System.out.println(str.substring(0,count));// ih
        //System.out.println(str.substring(count,str.length())); // ub (remaining)

        //left to right rotation
        str=str.substring(count,str.length())+str.substring(0,count);

        System.out.println(str);
    }
}
```

72. Write a java program to create your own immutable class?

```
public final class ImmutableClass
{
    private final int i;
    private final String s;

    // Constructor to initialize immutable fields
    public ImmutableClass(int i, String s) {
        this.i = i;
        this.s = s;
    }

    // Getter methods to access immutable fields
    public void getDetails()
    {
        System.out.println("Immutable Field is :" + i);
        System.out.println("Immutable String is :" + s);
    }
    public static void main(String[] args)
    {
        ImmutableClass ic = new ImmutableClass(10, "Immutable");
        ic.getDetails();

        ic.i=20; // invalid
        ic.s="myobject"; // invalid
    }
}
```

73. Write a java program to check given string is anagram or not?

Input:

```
str1="silent";
str2="listen";
```

Output:

It is a anagram string

```
import java.util.Arrays;
class AnagramApp
{
    public static void main(String[] args)
    {
        String str1="silent";
        String str2="listen";

        char[] carr1=str1.toCharArray();
        char[] carr2=str2.toCharArray();

        //sorting
        Arrays.sort(carr1); // e i l n s t
        Arrays.sort(carr2); // e i l n s t

        boolean flag=true;
        for(int i=0;i<carr1.length && i<carr2.length;i++)
        {
            if(carr1[i] != carr2[i])
            {
                flag=false;
                break;
            }
        }
        if(flag==true)
            System.out.println("It is an anagram string");
        else
            System.out.println("It is not an anagram string");
    }
}
```

Input:

```
silent
listen
```

Output:

It is an anagram string

74. Write a java program to display most repeating character in a given string?

Input:

ihubtalentinstitute

Output:

t is repeating for 5 times

```
class MostRepeating
{
    public static void main(String[] args)
    {
        String str="ihubtalentinstitute";

        int maxCount=0;
        char character=' ';

        for(int i=0;i<str.length();i++)
        {
            int cnt=0;

            for(int j=0;j<str.length();j++)
            {
                if(str.charAt(i)==str.charAt(j))
                {
                    cnt++;
                }
            }
            if(maxCount<cnt)
            {
                maxCount=cnt;
                character=str.charAt(i);
            }
        }
        System.out.println(character+" is repeating for "+maxCount+" times");
    }
}
```

StringBuffer

75. Write a java program to display reverse of a given string?

Input:

hello

Output:

olleh

```
class StringBuffer
{
    public static void main(String[] args)
    {
        String str="hello";

        StringBuffer sb=new StringBuffer(str);

        String rev=sb.reverse().toString();

        System.out.println(rev);
    }
}
```

76. Write a java program to check given string is palindrome or not?

Input:

racar

Output:

It is a palindrome string

```
class Test
{
    public static void main(String[] args)
    {
        String str="racar";

        StringBuffer sb=new StringBuffer(str);

        String rev=sb.reverse().toString();

        if(str.equals(rev))
            System.out.println("It is a palindrome string");
        else
            System.out.println("It is not a palindrome string");

    }
}
```

77. Write a java program to display the given string in below format?

Input:

ABBCCDDDD

Output:

A1B2C3D4

```
package com.ihub.www;
class StringFormat
{
    public static void main(String[] args)
    {
        String str="ABBCCDDDD";

        StringBuffer sb=new StringBuffer();

        int count=1;

        for(int i=0;i<str.length();i++)
        {
            if(i<str.length()-1 && str.charAt(i) == str.charAt(i+1))
            {
                count++;
            }
            else
            {
                sb.append(str.charAt(i)).append(count);
                count=1;
            }
        }
        System.out.println(sb.toString());
    }
}
```

78. Write a java program to perform multiplication of two arrays?

Input:

```
arr1 = 6 2 4  
arr2 = 3 1
```

Output:

```
19344 (624*31)
```

```
class MultiplicationOfTwoArray  
{  
    public static void main(String[] args)  
    {  
        int[] arr1 ={6,2,4};  
        int[] arr2 ={3,1};  
  
        String str1=arrayToString(arr1);  
        String str2=arrayToString(arr2);  
  
        //convert string to int  
        int a=Integer.parseInt(str1);  
        int b=Integer.parseInt(str2);  
        System.out.println(a*b);  
    }  
    public static String arrayToString(int[] arr)  
    {  
        StringBuffer sb=new StringBuffer();  
  
        //for each loop  
        for(int i:arr)  
        {  
            sb.append(i);  
        }  
  
        return sb.toString();  
    }  
}
```

Collections

79. Write a java program to check given string is balanced or not?

Input:

{[()]}{}

Output:

It is a balanced string

```
import java.util.*;
class Test
{
    public static void main(String[] args)
    {
        String str="{[()]}{";

        if(isBalanced(str.toCharArray()))
            System.out.println("It is balanced string");
        else
            System.out.println("It is not balanced string");
    }

    //callie method
    public static boolean isBalanced(char[] carr)
    {
        Stack<Character> s=new Stack<Character>();
        for(char ch:carr)
        {
            if(ch=='{' || ch=='[' || ch=='(')
            {
                s.push(ch);
            }
            else if(ch=='}' && !s.empty() && s.peek()=='{')
            {
                s.pop();
            }
            else if(ch==']' && !s.empty() && s.peek()=='[')
            {
                s.pop();
            }
            else if(ch==')' && !s.empty() && s.peek()=='(')
            {
                s.pop();
            }
            else
            {
                return false;
            }
        }
        return s.isEmpty();
    }
}
```

80. Write a java program to display duplicate and unique elements from given array?

```
import java.util.*;
class UniqueAndDuplicate
{
    public static void main(String[] args)
    {
        int[] arr={1,1,2,3,3,4,5,5,5};

        Set<Integer> unique=new LinkedHashSet<Integer>();
        Set<Integer> duplicate=new LinkedHashSet<Integer>();

        for(int i:arr)
        {
            if(!unique.add(i))
            {
                duplicate.add(i);
            }
            unique.add(i);
        }
        System.out.println(unique);
        System.out.println(duplicate);
    }
}
```

81. Write a java program to display number of words present in a given string?

Input:

this is is java java

Output:

this=1,is=2,java=2

```
import java.util.*;
class NoOfWords
{
    public static void main(String[] args)
    {
        String str="this is is java java";

        String[] sarr=str.split(" ");

        Map<String,Integer> map=new LinkedHashMap<String,Integer>();

        //for each loop
        for(String s:sarr)
        {
            if(map.get(s)!=null)
            {
                map.put(s,map.get(s)+1);
            }
            else
            {
                map.put(s,1);
            }
        }

        System.out.println(map);
    }
}
```

82. Write a java program to display number of characters present in a given string?

Input:

java

Output:

j=1,a=2,v=1

```
import java.util.*;
class NoOfCharacters
{
    public static void main(String[] args)
    {
        String str="java";

        char[] carr=str.toCharArray();

        Map<Character,Integer> map=new LinkedHashMap<Character,Integer>();

        //for each loop
        for(char c:carr)
        {
            if(map.get(c)!=null)
            {
                map.put(c,map.get(c)+1);
            }
            else
            {
                map.put(c,1);
            }
        }
        System.out.println(map);
    }
}
```

Date

83. Write a java program to display Date and Time?

```
import java.time.LocalDate;
import java.time.LocalTime;
class DateAndTime
{
    public static void main(String[] args)
    {
        LocalDate date=LocalDate.now();
        System.out.println(date);

        LocalTime time=LocalTime.now();
        System.out.println(time);
    }
}
```

Or

```
class DateAndTime
{
    public static void main(String[] args)
    {
        java.util.Date d=new java.util.Date();
        System.out.println(d);
    }
}
```

84. Write a java program to compare two dates?

```
import java.time.LocalDate;
class CompareTwoDates
{
    public static void main(String[] args)
    {
        LocalDate d1=LocalDate.now(); // 2024-02-09

        LocalDate d2=LocalDate.now(); // 2024-02-09

        if(d1.compareTo(d2)<0)
            System.out.println("Date1 less than Date2");
        else if(d1.compareTo(d2)>0)
            System.out.println("Date1 greater than Date2");
        else
            System.out.println("Both Date are same");
    }
}
```

Exception Handling

85. Write a java program to create custom exceptions?

```
class TooYoungException extends RuntimeException
{
    TooYoungException(String msg)
    {
        super(msg);
    }
}
class TooOldException extends RuntimeException
{
    TooOldException(String msg)
    {
        super(msg);
    }
}
class CustomException
{
    public static void main(String[] args)
    {
        Scanner sc=new Scanner(System.in);
        System.out.println("Enter the age :");
        int age=sc.nextInt();

        if(age<18)
            throw new TooYoungException("U r not eligible to vote");
        else
            throw new TooOldException("U r eligible to vote");
    }
}
```

86. Write a java program to handle multiple exceptions using single catch block?

```
class HandleMultipleExceptions
{
    public static void main(String[] args)
    {
        try
        {
            System.out.println(10/0);
        }
        catch (ArithmaticException | NullPointerException | ClassCastException e)
        {
            System.out.println("catch-block");
        }
    }
}
```

Java 8 Features

87. Write a java program on functional interface and lamda expression?

```
@FunctionalInterface  
interface A  
{  
    //abstract method  
    public abstract void m1();  
}  
class LamdaExpression  
{  
    public static void main(String[] args)  
    {  
        A a=()->  
        {  
            System.out.println("Hello World");  
        };  
        a.m1();  
    }  
}
```

88. How to achieve multiple inheritance in java?

```
interface Right  
{  
    default void m1()  
    {  
        System.out.println("Right-M1-Method");  
    }  
}  
interface Left  
{  
    default void m1()  
    {  
        System.out.println("Left-M1-Method");  
    }  
}  
class Middle implements Right,Left  
{  
    public void m1()  
    {  
        Right.super.m1();  
        Left.super.m1();  
    }  
}  
class MultipleInheritance  
{  
    public static void main(String[] args)  
    {  
        Middle m=new Middle();  
        m.m1();  
    }  
}
```

89. Write a java program to display employee details based on sorting order of salary?

```
import java.util.*;
import java.util.stream.*;
class Employee
{
    private int empId;
    private String empName;
    private double empSal;
    Employee(int empId, String empName, double empSal)
    {
        this.empId=empId;
        this.empName=empName;
        this.empSal=empSal;
    }
    public int getEmpId()
    {
        return empId;
    }
    public String getEmpName()
    {
        return empName;
    }
    public double getEmpSal()
    {
        return empSal;
    }
}
class IdSortingOrder
{
    public static void main(String[] args)
    {
        List<Employee> list=new ArrayList<Employee>();
        list.add(new Employee(101,"Alan",10000));
        list.add(new Employee(105,"Jose",50000));
        list.add(new Employee(103,"Nelson",30000));
        list.add(new Employee(104,"Lara",40000));
        list.add(new Employee(102,"Brook",20000));

        List<Employee> newList=list.stream()
            .sorted(Comparator.comparingInt(Employee::getEmpId))
            .collect(Collectors.toList());

        newList.forEach(employee ->
        System.out.println(employee.getEmpId()+" "+employee.getEmpName()+" "+employee.getEmpSal()));
    }
}
```

90. Write a java program to display employee details based on sorting order of employee names?

```
import java.util.*;
import java.util.stream.*;
class Employee
{
    private int empld;
    private String empName;
    private double empSal;
    Employee(int empld,String empName,double empSal)
    {
        this.empld=empld;
        this.empName=empName;
        this.empSal=empSal;
    }
    public int getEmpld()
    {
        return empld;
    }
    public String getEmpName()
    {
        return empName;
    }
    public double getEmpSal()
    {
        return empSal;
    }
}
class NameSortingOrder
{
    public static void main(String[] args)
    {
        List<Employee> list=new ArrayList<Employee>();
        list.add(new Employee(101,"Alan",10000));
        list.add(new Employee(105,"Jose",50000));
        list.add(new Employee(103,"Nelson",30000));
        list.add(new Employee(104,"Lara",40000));
        list.add(new Employee(102,"Brook",20000));

        List<Employee> newList=list.stream()
            .sorted(Comparator.comparing(Employee::getEmpName)).collect(Collectors.toList());

        newList.forEach(employee ->
        System.out.println(employee.getEmpld()+" "+employee.getEmpName()+""
            "+employee.getEmpSal()));
    }
}
```

Oracle Questions

ID	NAME	SALARY	DEPTNO	JOB	HIREDATE
1007	Alan	70000	10	Clerk	01-MAR-20
1210	Jose	35000	10	Clerk	15-FEB-19
1163	Mark	13000	20	Manager	23-DEC-23
1109	Kelvin	40000	20	Manager	29-JUL-22
1021	Lara	25000	30	Hr	07-SEP-21
1298	Erick	10000	30	Hr	12-OCT-18
1345	Brook	18000	40	Salesman	19-APR-22

1. Write a query to create an employee table?

```
create table employee (id number(3),name varchar2(10), salary number(10,2),
deptno number(3),job varchar2(10), hiredate date);
```

2. Write a query to create employee table using constraints?

```
create table employee (id number(4) primary key,
name varchar2(10) not null,
salary number(10,2) check(salary between 5000 AND 50000),
deptno number(3) NOT NULL,
job varchar2(10) NOT NULL,
hiredate date NOT NULL);
```

3. Write a query to see the list of tables present in database?

```
select * from tab;
```

4. Write a query to see the logical database name?

```
select * from global_name;
```

5. Write a query to see the list of users present in database?

```
select username from all_users;
```

6. Write a query to change the password?

```
ALTER USER system IDENTIFIED BY admin123;
```

7. Write a query to display employee's information from employee table?

```
select * from employee;
```

8. Write a query to display employee's information based on sorting order of employee id?

```
select * from employee order by id;
```

9. Write a query to display current date and time?

```
select current_date from dual;
```

10. Write a query to see the list of records present in employee table?

```
select count(*) from employee;
```

11. Write a query to display first three records from employee table?

```
select * from employee where rownum<=3;
```

12. Write a query to display exact fourth record from employee table?

```
select * from employee where rownum<=4  
minus  
select * from employee where rownum<=3;
```

13. Write a query to display employee's information those who working in 10 department?

```
select * from employee where deptno=10;
```

14. Write a query to display employee's information whose employee id is 1007, 1210 & 1163?

```
select * from employee where id IN(1007,1210,1163);
```

15. Write a query to display employee's information those who are not working in 20 department?

```
select * from employee where deptno <>20;
```

16. Write a query to display employee's information whose salary is null?

```
select * from employee where salary is null;
```

17. Write a query to display employee's information whose employee name start with 'A' letter?

```
select * from employee where name like 'A%';
```

18. Write a query to display employee id, employee name, employee salary and Annual salary?

```
select id, name, salary, salary*12 as Annual_salary from employee;
```

19. Write a query to display employee's information whose salary between 30000 and 50000?

```
select * from employee where salary between 30000 AND 50000;
```

20. Write a query to see the list of views present in database?

```
select view_name from user_views;
```

21. Write a query to see the list of synonyms present in database?

```
select synonym_name from user_synonyms;
```

22. Write a query to see the list of indexes present in database?

```
select index_name from user_indexes;
```

23. Write a query to display highest salary from employee table?

```
select max(salary) from employee;
```

24. Write a query to display average salary of each employee?

```
select avg(salary) from employee;
```

25. Write a query to display second highest salary from employee table?

```
select max(salary) from employee where salary<(select max(salary) from employee);
```

26. Write a query to display sum of salary of each department?

```
select sum(salary),deptno from employee group by deptno;
```

27. Write a query to display sum of salary of each job?

```
select sum(salary),job from employee group by job;
```

28. Write a query to check username and password is valid or not?

```
select count(*) from userlist where uname='raja' and pwd='rani';
```

29. Write a query on group by clause, having clause and order by clause?

```
select sum(salary),deptno from employee  
group by deptno  
having sum(salary)>36000  
order by deptno;
```

30. Write a query to display all the employees of hyderabad from highest to lowest salary?

```
select id, name, salary FROM employee where city = 'Hyderabad' ORDER BY salary DESC;
```

31. Write a query to select all the names and their salary who has a role of developer?

```
SELECT name, salary FROM employee WHERE job = 'Developer';
```

32. Write a query to select all the employees names of managers and developers who works as team moon?

```
SELECT name FROM employee WHERE JOB IN('Manager', 'Developer')  
AND team = 'Team Moon';
```

33. Write a query to display average salary of employees who are from Hyderabad?

```
select avg(salary) as average_salary from employee where city='Hyderabad';
```

34. Write a query to select employee names of manager and developers from hyderabad and salary more than 35000?

```
SELECT employee_name FROM employees  
WHERE JOB IN('Manager', 'Developer') AND city = 'Hyderabad' AND salary > 35000;
```

35. Write a query to display date and time?

```
select TO_CHAR(sysdate,'HH:MI:SS YYYY-MM-DD') as Date_And_Time from dual;
```

36. Write a query to replace '9' digit with '0'?

```
select replace(salary,9,0) from employee;
```

37. Write a query to increase the salary of all developers of hyderabad by 20%?

```
update employee set salary = salary * 1.20  
where job = 'Developer' AND city = 'Hyderabad';
```

38. Write a query to promote all employees from clerk to manager?

```
update employee set job='Manager' where job='Clerk';
```

39. Write a query to increment salary by 5000 based on employee id?

```
update employee set salary=salary+5000 where id=1109;
```

40. Write a query to terminate the employees whose employee id is 1109 and 1021?

```
delete from employee where IN (1109 , 1021);
```

41. Write a query to delete the records those who joined before 01-MAR-20?

```
delete from employee where hiredate < TO_DATE('2020-03-01', 'YYYY-MM-DD');
```

42. Write a query to truncate the table?

```
truncate table employee;
```

43. Write a query to drop the table?

```
drop table employee;
```

44. Write a query to create a synonym?

```
create synonym sy1 for employee;
```

45. Write a query to drop the synonym?

```
drop synonym syn1;
```

46. Write a query to create a sequence?

```
create sequence sq1 start with 100 increment by 1;
```

47. Write a query to drop the sequence?

```
drop sequence sq1;
```

48. Write a query to rename the column name from job to designation?

```
alter table employee rename column job to designation;
```

49. Write a query to rename table name?

```
rename employee to employees;
```

50. Write a query to create an index?

```
create view v1 as select * from employee;
```

51. Write a query to drop a view?

```
drop view v1;
```

52. Write a query to create a complex view?

```
create view v1 as select e.id, e.name, e.sal, d.dname, d.dloc from employee e, dept d  
where (e.deptno=d.deptno);
```

53. Write a query to display all employees' information whose salary is greater than Alan salary?

```
select salary from employee where salary>(select salary from employee where name='Alan');
```

54. Write a query to delete duplicate records from employee table?

```
DELETE FROM employee WHERE ROWID NOT IN (  
    SELECT MAX(ROWID) FROM employee group by id  
)
```

55. Write a query for equi-join?

```
select e.id, e.name, e.salary, d.dname, d.dloc from employee e, dept d  
where(e.deptno=d.deptno);
```

56. Write a query for inner join?

```
select e.id, e.name, e.salary, d.dname, d.dloc from employee e join dept d  
ON(e.deptno=d.deptno);
```

57. Write a query for outer join?

```
select e.id, e.name, e.salary, d.dname, d.dloc from employee e LEFT OUTER JOIN dept d  
ON(e.deptno=d.deptno);
```

Or

```
select e.id, e.name, e.salary, d.dname, d.dloc from employee e Right OUTER JOIN dept d  
ON(e.deptno=d.deptno);
```

Or

```
select e.id, e.name, e.salary, d.dname, d.dloc from employee e FULL OUTER JOIN dept d  
ON(e.deptno=d.deptno);
```

58. Write a query for self-join?

```
select e1.id,e1.name,e1.salary,e2.deptno,e2.hiredate from employee e1, employee e2  
where(e1.deptno=e2.deptno);
```

59. Create a procedure in PL/SQL?

```
create or replace procedure sum (A IN number, B IN number)  
IS  
C number;  
BEGIN  
C:=A+B;  
DBMS_OUTPUT.PUT_LINE(C);  
END;  
/
```

60. Create a function in PL/SQL?

```
create or replace function ret_sum (A number, B number)  
Return number  
Is  
C number;  
Begin  
C:=A+B;  
return C;  
END;  
/
```

61. Create a Trigger in PL/SQL?

```
create or replace trigger trg1 before insert on student  
begin  
DBMS_OUTPUT.PUT_LINE('Thankyou for inserting the data');  
END;  
/
```

62. Create a Cursor in PL/SQL?

```
DECLARE  
CURSOR C1 is select * from emp;  
A emp%ROWTYPE;  
BEGIN  
OPEN C1;  
LOOP  
FETCH C1 into A;  
DBMS_OUTPUT.PUT_LINE(A.eid||'|'||A.ename||'|'||A.esal||'|'||A.deptno||'|'||A.job);  
EXIT WHEN C1%NOTFOUND;  
END LOOP;  
CLOSE C1;  
END;  
/
```

63. Write a query to see the source code of a procedure?

```
select text from user_source where name='SUM';
```

64. Write a query to see the source code of a function?

```
select text from user_source where name='RET_SUM';
```

65. Write a query to see the list of procedures present in database?

```
select object_name from user_objects where object_type='PROCEDURE';
```

66. Write a query to see the list of functions present in database?

```
select object_name from user_objects where object_type='FUNCTION';
```

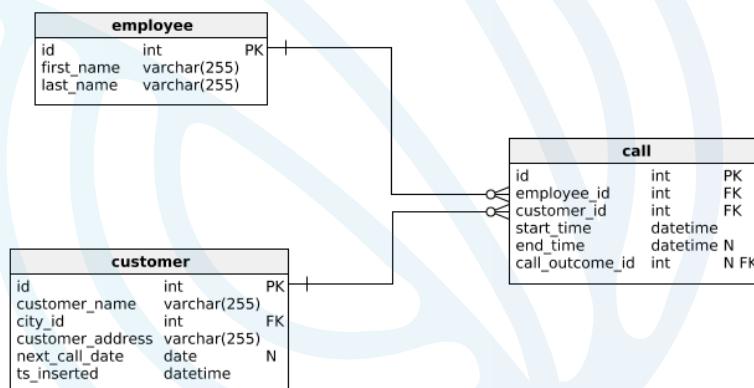
67. Write a query to see the list of packages present in database?

```
select object_name from user_objects where object_type='PACKAGE';
```

68. Write a query to see the list of triggers present in database?

```
select object_name from user_objects where object_type='TRIGGER';
```

69. Write a query to display employee id, first name, last name, call start time, call end time, customer id, customer name, customer address?



```
select emp.id, emp.first_name, emp.last_name,
       c.start_time, c.end_time from employee e INNER JOIN call c
       ON(emp.id=c.employee_id) INNER JOIN customer cust
       ON(cust.id=call.customer_id);
```

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