BASIC PROGRAMS

1. Program to compute Addition.

```
import java.util.Scanner;
public class Addition {

	public static void main(String args[]) {
		Scanner sc= new Scanner(System.in);
		int number1,number2,addtion;

		System.out.println("Please enter value of number1");
		number1=sc.nextInt();		// user input for number1
		System.out.println("Please enter value of number2");
		number2=sc.nextInt();		// user input for number2

		addtion=number1+number2;	//addition

		System.out.println("The sum of "+number1+" and "+number2+" is "+addtion);
	}
}
```

Output:

```
Please enter value of number1
234
Please enter value of number2
567
The sum of 234 and 567 is 801
```

2. Program on Area of circle and Rectangle

```
import java.util.Scanner;
public class AreaCalc {

	public static void main(String[] args)  {
		double radius, areac;
		int length, breadth,arear;
		Scanner sc=new Scanner(System.in);

		System.out.println("-----CIRCLE-----");
		System.out.println("Enter radius of circle : ");
		radius=sc.nextDouble();
		areac=3.14*radius*radius;
```

```
                System.out.println("Area of Circle is : "+areac);

                System.out.println("-----RECTANGLE-----");
                System.out.println("Enter length and breadth of rectangle : ");
                length=sc.nextInt();
                breadth=sc.nextInt();
                arear=length*breadth;
                System.out.println("Area of Rectangle is : "+arear);

                sc.close();
        }
}
```

Output:

```
-----CIRCLE-----
Enter radius of circle :
34
Area of Circle is : 3629.84
-----RECTANGLE-----
Enter length and breadth of rectangle :
23
56
Area of Rectangle is : 1288
```

3. Program on Mod,Div Operator to check the number of notes in ATM Transaction

```
import java.util.Scanner;
public class ATMNotes {

        public static void main(String args[]) {
                Scanner sc= new Scanner(System.in);
                int amount;
                int notes;
                System.out.println("Enter amount : ");
                amount=sc.nextInt();

                if(amount%100!=0)
                {
                        System.out.println("Invalid amount entered");
                }
                else
                {
```

```
                        if(amount>=1000)
                        {
                        notes=amount/1000;
                        amount=amount%1000;
                        System.out.println("notes of 1000 : "+notes);
                        }

                        if(amount>=500)
                        {
                                notes=amount/500;
                                amount=amount%500;
                                System.out.println("notes of 500 : "+notes);
                        }
                        if(amount>=100)
                        {
                                notes=amount/100;
                                amount=amount%100;
                                System.out.println("notes of 100 : "+notes);
                        }
                }
        }
    }
```

Output:

```
Enter amount :
4600
notes of 1000 : 4
notes of 500 : 1
notes of 100 : 1
```

4. Program to perform arithmetic operation using switch case

```
import java.util.Scanner;

public class ArithmeticSwitch {
        public static void main(String[] args)  {
                Scanner sc=new Scanner(System.in);
                int choice, a=0,b=0;
                int add,sub,mult;
                double div;
                do
                {
```

```
                System.out.println("1.Add\n2.Substract\n3.Multiply\n4.devide\n5.exit");
                System.out.println("\nEnter yout choice");
                choice=sc.nextInt();
                System.out.println("enter value of a: ");
                a=sc.nextInt();
                System.out.println("enter value of b: ");
                b=sc.nextInt();
                switch(choice)
                {
                 case 1:
                        System.out.println("-----Addition-----");
                        add=a+b;
                        System.out.println("Addition is " +add);
                        break;

                 case 2:
                        System.out.println("-----Subtraction-----");
                        sub=a-b;
                        System.out.println("Subtraction is " +sub);
                        break;
                case 3:
                        System.out.println("-----Multiplication-----");
                        mult=a*b;
                        System.out.println("Multiplication is " +mult);
                        break;
                 case 4:
                        System.out.println("-----Division-----");
                        div=(double)a/b;
                        System.out.println("division is " +div);
                        break;
                 case 5:
                        System.out.println("Thank you...");
                        System.exit(0);
                        break;
                default:
                         System.out.println("U have entered wrong choice");
                         break;
                }
            }while(choice!=5);
        sc.close();
        }
}
```

Output:

```
1.Add
2.Substract
3.Multiply
4.devide
5.exit

Enter yout choice
4
-----Division-----
enter value of a=
56
enter value of b=
34
division is 1.6470588235294117
1.Add
2.Substract
3.Multiply
4.devide
5.exit

Enter yout choice
1
-----Addition-----
enter value of a:
56
enter value of b:
78
Addition is 134
1.Add
2.Substract
3.Multiply
4.devide
5.exit

Enter yout choice
5
Thank you...
```

5. Program to validate date,month and year using switch case.

```
import java.util.Scanner;

public class DateValidationSwitch {
	public static void main(String[] args) {
		Scanner sc= new Scanner(System.in);
		 int dd , mm , yyyy;
		 int no_of_days=0;
		System.out.println("Enter  date(dd): ");
		dd=sc.nextInt();
		System.out.println("Enter month(mm): ");
		mm=sc.nextInt();
		System.out.println("Enter year(yyyy): ");
		yyyy=sc.nextInt();

		switch(mm)
		{
			case 1: case 3: case 5: case 7: case 8: case 10: case 12:
				no_of_days=31;
			break;
			case 4: case 6: case 9: case 11:
				no_of_days=30;
			break;
			case 2:
				if(yyyy%100==0)
				{	System.out.println("This is centurian year");
					if(yyyy%400==0)
					{
						no_of_days=29;
						System.out.println("This is leap year");
					}
					else
					{
						no_of_days=28;
						System.out.println("This is not leap year");
					}
				}
				else if(yyyy%4==0)
				{
					no_of_days=29;
					System.out.println("This is leap year");
				}
				else
```

```
                        {
                                no_of_days=28;
                                System.out.println("This is not leap year");
                        }
                break;

                default:
                        System.out.println("You have entered invalid month");
        }// end switch
        if(dd<=no_of_days)
        {
                System.out.println("Given date is valid");
        }
        else
        {
                System.out.println("Given date is invalid");
        }
    sc.close();
    }
}
```

Output:

```
Enter  date(dd):
29
Enter month(mm):
2
Enter year(yyyy):
2016
This is leap year
Given date is valid
```

6. Program using increment , decrement and ternary operators

```
public class IncrementDecrement {
    public static void main(String[] args)
    {
        int a=10,b=20,c,d,e,g,h,i;
        System.out.println("values before increment "+a+" and "+b);

        c = ++a;          // pre increment
        d = ++b;
```

```
                System.out.println("values after increment "+c+" and "+d);

                e= a>b ?++a:++b;

                System.out.println("turnary operator value "+e);

                g=e++;              // post increment
                System.out.println("value after increment "+g);

                h=g--;
                System.out.println("value after decrement "+h);

                i=--h;
                System.out.println("value after decrement "+i);
        }
}
```

Output:

values before increment 10 and 20
values after increment 11 and 21
turnary operator value 22
value after increment 22
value after decrement 22
value after decrement 21

7. Program to calculate percentage of marks and display the grade.

```
import java.util.Scanner;

public class GradeCalc {
        public static void main(String[] args)
        {
                Scanner sc=new Scanner(System.in);
                double percentage,totalmarks;
                int  math,eng,phys;

                System.out.println("enter your math score =");
                math=sc.nextInt();
                System.out.println("**************\nenter your eng score =");
                eng=sc.nextInt();

                System.out.println("**************\nenter your phys score =");
```

```
                phys=sc.nextInt();
                totalmarks=math+eng+phys;
                percentage=(double)(totalmarks/300.0)*100;
                System.out.println("your percentage : "+percentage);

                if(percentage>=70)
                {
                        System.out.println("Congrats... you got First class with Distinction");
                }
                else if(percentage<70 && percentage>=60)
                {
                        System.out.println("Congrats... you got First class");
                }
                else if(percentage<60 && percentage>=40)
                {
                        System.out.println("Congrats... you are passed");
                }
                else
                {
                        System.out.println("Sorry... You are fail");
                }
            sc.close();
        }
}
```

Output:

```
enter your math score =
63
**************
enter your eng score =
73
**************
enter your phys score =
84
your percentage : 73.33
Congrats... you got First class with Distinction
```

8. Program to determine Prime Number.

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

```
                int i,no;
                System.out.println("enter the no");
                no=sc.nextInt();

                for(i=2;i<=no;i++)
                {
                        if(no%i==0)
                        break;
                }
                if(i==no)
                {
                        System.out.println("Given number is a prime no");
                }
                else
                {
                        System.out.println("Given number is not a prime no");
                }
                sc.close();
        }
}
```

Output:

enter the no
79
Given number is a prime no

9. Program on Fibonacci series

```
import java.util.Scanner;

public class FibonnacciSeries {
        public static void main(String[] args)  {
                Scanner sc=new Scanner(System.in);
                System.out.println("Enter the number for series : ");
                int num=sc.nextInt();

                int p=0 ,q=1, r=0,i;
                System.out.println("The fibonnacci series for number "+num+" is:");
                for(i=1;i<num;i++)
                {
                        System.out.print(p+"  ");
                        r=p+q;
```

```
                    p=q;
                    q=r;
                }
        }
}
```

Output:

```
Enter the number for series :
10
The fibonnacci series for number 10 is:
0  1  1  2  3  5  8  13  21
```

10. Program on Reverse Number

```
import java.util.Scanner;
public class ReverseNumber {
        public static void main(String args[]){
            int original, reverse=0, number;
            Scanner in = new Scanner(System.in);

            System.out.println("Enter a number ");
            number = in.nextInt();

            original=number;
            while(number!=0)
            {
                rem=number%10;
                reverse = reverse*10+rem;
                number=number/10;
            }
                System.out.println("Original number : "+original);
                System.out.println("Reverse number : "+reverse);

        }
}
```

Output:

```
Enter a number to check if it is a palindrome
1234
Reverse number : 4321
```

11. Program to check number as Palindrome

```
/* A number is palindrome if the number and its reverse is same*/

import java.util.Scanner;
public class PalindromeNumber {
        public static void main(String args[]){
            int original, reverse=0, number;
            Scanner in = new Scanner(System.in);

            System.out.println("Enter a number to check if it is a palindrome");
            number = in.nextInt();

            original=number;
            while(number!=0)
            {
                  rem=number%10;
                  reverse = reverse*10+rem;
                  number=number/10;
            }
                 System.out.println("Original number : "+original);
                 System.out.println("Reverse number : "+reverse);


            if(original==reverse)
            {
                  System.out.println("Numebr is palindrome");
            }
        }
}
```

Output:

```
Enter a number to check if it is a palindrome
1234321
Reverse number : 1234321
Numebr is palindrome
```

12. Program on Armstrong Number

```
/* Armstrong number is an integer such that the sum of the cubes of its digits is equal to the number
itself.*/

import java.util.Scanner;
public class ArmstrongNumber {
        public static void main(String arg[]){
```

```
                Scanner sc=new Scanner(System.in);
                int no,rem=0,x=0;
                System.out.println("enter the number to check for armstrong");
                no=sc.nextInt();
                int p=no;

                while(no>0)
                {
                        rem=no%10;
                        x = x + (rem * rem * rem);
                        no=no/10;
                }
                if(p==x)
                {
                        System.out.println("this is an armstrong");
                }
                else{
                        System.out.println("This is not an armstrong number");
                }
                sc.close();
                }
}
```

Output:

enter the number to check for armstrong
371
this is a armstrong

13. Programs on patterns:

1.

11111
22222
33333
44444
55555

```
public class Pattern1 {
        public static void main(String[] args) {
                for(int i=1;i<=5;i++)
                {
                        for(int j=1;j<=5;j++)
                        {
                                System.out.print(i);
```

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

2.

```
12345
12345
12345
12345
12345
public class ForSeries1 {
    public static void main(String[] args) {
        for(int i=1;i<=5;i++)
        {
            for(int j=1;j<=5;j++)
            {
                System.out.print(j);
            }
            System.out.println(" ");
        }
    }
}
```

3.

```
1
22
333
4444
55555
public class Pattern2 {
    public static void main(String args[]) {
        for(int i=1;i<=5;i++)
        {
            for(int j=1;j<=i;j++)
            {
            System.out.print(i);
            }
            System.out.println("");
        }
    }
```

```
}
```

4.

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

```
public class forseries3 {
        public static void main(String[] args) {
                int i,j,k;
                {
                        for(i=0;i<5;i++)
                        {
                                for(k=5;k>i;k--)
                                {
                                        System.out.print(" ");
                                }
                                for(j=0;j<i;j++)
                                {
                                        System.out.print("*");
                                        System.out.print(" ");
                                }
                                System.out.println("");
                        }

                        for(i=0;i<5;i++)
                        {
                                for(k=0;k<i;k++)
                                {
                                        System.out.print(" ");
                                }
                                for(j=5;j>i;j--)
                                {
                                        System.out.print("*");
                                        System.out.print(" ");
```

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

5.

```
        1 2 1
      1 2 3 2 1
    1 2 3 4 3 2 1
  1 2 3 4 5 4 3 2 1
1 2 3 4 5 6 5 4 3 2 1
```

```
public class forloopdemo {
    public static void main(String[]args) {
        int i,j,k=0;

        for(i=1;i<=5;i++)
        {
            for(int m=5;m>=i;m--)
            {
                System.out.print("  ");
            }
            for(j=1;j<=i;j++)
            {
                System.out.print(j);
                System.out.print(" ");

            }
            for(k=j;k>0;k--)
            {
                System.out.print(k);
                System.out.print(" ");
            }
            System.out.println();
        }
    }
}
```

6.

```
5
 4
  3
   2
    1
```

```
public class for_demo  {
        public static void main(String[] args)
        {
                int k=5;
                for(int i=0;i<5;i++)
                {
                        for(int m=0;m<i;m++)
                        {
                                System.out.print(" ");
                        }
                        for(int j=0;j<5;j++)
                        {
                                if(i==j)
                                {
                                        System.out.print(k);
                                        k--;
                                }
                        }
                        System.out.println("");
                }
        }
}
```

14. Sample Program on Arrays:

14.1. To Find Largest Elements in array.

```
import java.util.Scanner;
public class GreaterElementArrayDemo {
        public static void main(String args[]) {

                Scanner sc= new Scanner(System.in);
                 int arr[]=new int[5];

                System.out.println("enter five elements:");
```

```
                for(int i=0;i<5;i++)
                   {
                           arr[i]=sc.nextInt();
                   }

                int largest=0;

                for(int i=0;i<arr.length;i++)
                {
                           if(arr[i]>largest)
                                   largest=arr[i];
                 }
                System.out.println("Largest element in a array is "+largest);
        }
}
```

Output:

```
enter five elements:
34
56
12
67
34
Largest element in a array is 67
```

14.2. To find largest of odd numbers in a array

```
import java.util.Scanner;
public class LargestOddArrayDemo {

        public static void main(String args[]){
                Scanner sc= new Scanner(System.in);
                int arr[]=new int[5];

                 System.out.println("enter five int elements:");
                for(int i=0;i<5;i++)
                {
                           arr[i]=sc.nextInt();
                }

               int largest=0;
                for(int i=0;i<arr.length;i++)
                {
                        if (arr[i]>largest && arr[i]%2!=0)
```

```
                {
                        largest=arr[i];
                }

        }
        System.out.println("Largest odd element in array is "+ largest);
    }
}
```

Output:

```
enter five int elements:
23
45
56
21
34
Largest odd element in array is 45
```

14.3. To find Multiples of Five in array

```
import java.util.Scanner;
public class MultipleOfFiveArrayDemo {
    public static void main(String args[]) {

        Scanner sc= new Scanner(System.in);
        int arr[]=new int[5];

        System.out.println("enter five int elements:");
         for(int i=0;i<5;i++)
         {
                arr[i]=sc.nextInt();
          }

        System.out.println("Numbers multiple of five are:");
        for(int i=0;i<arr.length;i++)
        {
            if (arr[i]%5==0)
            {
                System.out.println(arr[i]);
            }

        }
    }
}
```

Output:

```
enter five int elements:
34
45
60
23
90
Numbers multiple of five are:
45
60
90
```

14.4. To sort elements in an array:

```
import java.util.Scanner;
public class SortElementsArrayDemo {
	public static void main(String args[]) {
		Scanner sc= new Scanner(System.in);
		int arr[]=new int[5];

		System.out.println("enter five int elements:");
		for(int i=0;i<5;i++)
		 {
			arr[i]=sc.nextInt();
		 }

		System.out.println("Array before Sorting:");
		 for(int i=0;i<5;i++)
		 {
			System.out.print(arr[i]+" ");
		 }

		 int temp=arr[0];
		 for(int i=0;i<arr.length-1;i++)
		  {
			for(int j=i+1;j<arr.length;j++)
			{
				if(arr[i]>arr[j])
				{
					temp=arr[i];
					arr[i]=arr[j];
					arr[j]=temp;
				}

			}
		 }//end for

		  System.out.println("\nArray after Sorting ascending:");
```

```
                for(int i=0;i<5;i++)
                 {
                    System.out.print(arr[i]+" ");
                 }
        }
}
```

Output:

```
enter five int elements:
45
23
78
56
90
Array before Sorting:
45 23 78 56 90
Array after Sorting ascending:
23 45 56 78 90
```

14.5. Program to find second and third largest element in a array.

```
public class arr_2nd_highestvalue {
        public static void main(String[] args) {
                int a[]=new int[5];
                int largest,i,k;
                int seclarg,thirdlarg;

                Scanner sc=new Scanner(System.in);
                System.out.println("enter values in the array");

                for(k=0;k<a.length;k++)
                {
                        a[k]=sc.nextInt();
                }

                largest=a[0];
                seclarg=a[1];
                thirdlarg=a[2];


                for(i=0;i<a.length;i++)
                {
                        if(a[i]>largest) //&& a[i]%5==0) //it will give largest value divisible by 5
                        {
```

```
                        thirdlarg=seclarg;
                        seclarg=largest;
                        largest=a[i];
                    }
                    else if(a[i]>seclarg && a[i]!=largest )
                    {
                        thirdlarg=seclarg;
                        seclarg=a[i];
                    }

                    else if(a[i]>thirdlarg && a[i]!=largest && a[i]!=seclarg )
                    {
                        thirdlarg=a[i];
                    }
                }//end for
                System.out.println("largest value : "+largest);
                System.out.println("second largest value is :"+seclarg);
                System.out.println("third largest value is :"+thirdlarg);

                sc.close();
        }
}
```

Output:

```
enter values in the array
10
40
60
80
90
largest value : 90
second largest value is :80
third largest value is :60
```

14.6. Program to add two matrices

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

                Scanner sc=new Scanner(System.in);
                int row1,col1,row2,col2;
                System.out.println("Enter row & col for first matrix");
                row1=sc.nextInt();
                col1=sc.nextInt();
```

```
                int a[][]=new int[row1][col1]; //initialized matrix
                System.out.println("Enter row & col for second matrix");
                row2=sc.nextInt();
                col2=sc.nextInt();

                int b[][]=new int[row2][col2]; //initialized matrix
                if(row1!=row2 || col1!=col2)
                {
                        System.out.println("Matric Addition Not Possible...");
                }
                else
                {
                        System.out.println("Enter the Elements for first Matrices");
                        for (int i = 0; i < row1; i++) {
                                for (int j = 0; j < col1; j++) {
                        a[i][j] = sc.nextInt();
                                }
                        }

                        System.out.println("Enter the second matrix");
                        for (int i = 0; i < row1; i++) {
                                 for (int j = 0; j < col1; j++) {
                                        b[i][j] = sc.nextInt();
                                }
                         }

                        int[][] c = new int[row1][col1];
                          for (int i = 0; i < row1; i++) {
                                for (int j = 0; j < col1; j++) {
                                        c[i][j] = a[i][j] + b[i][j];
                                }
                        }
                         System.out.println("The sum of the two matrices is");
                        for (int i = 0; i < row1; i++) {
                                 for (int j = 0; j < col1; j++) {
                                        System.out.print(c[i][j] + " ");
                                 }
                           System.out.println();
                        }
                }//end else
        }
}
```

Output:

Enter row & col for first matrix

2

2

Enter row & col for second matrix

```
2
2
Enter the Elements for first Matrices
1
2
3
4
Enter the second matrix
1
2
3
4
The sum of the two matrices is
2 4
6 8
```

14.7. Program to sort Percentage Column in a matrix in a descending Order using two dimension array.

```
public class mul_dim_arr_sort {
	public static void main(String[] args) {
		Scanner sc=new Scanner(System.in);
		int row,col;
		System.out.println("Enter row & col in matrix");
		int i=0 , j=0;
		row=sc.nextInt();
		col=sc.nextInt();
		int a[][]=new int[row][col];
		System.out.println("enter roll no, total marks and percentage  in matrix");
		for(i=0;i<row;i++) {
			for(j=0;j<col;j++) {
				a[i][j]=sc.nextInt();
			}
		}
		System.out.println("matrix before sort");//printing matrix which entered-
		System.out.println(" roll no   total marks    percentage ");
		for(int k=0;k<row;k++)
		{
			for(int m=0;m<col;m++)
			{
				System.out.print(a[k][m] +" ");

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

```
                }
                for(int n=0;n<row;n++)
                {
                        for(int p=n+1;p<row;p++)
                        {
                                if(a[n][2]<a[p][2])
                                {
                                        int temp;
                                        temp=a[n][0];
                                        a[n][0]=a[p][0];
                                        a[p][0]=temp;

                                        temp=a[n][1];


                                        a[n][1]=a[p][1];
                                        a[p][1]=temp;

                                        temp=a[n][2];
                                        a[n][2]=a[p][2];
                                        a[p][2]=temp;
                                }
                        }
                }

                System.out.println("Matrix after sort");
                 System.out.println(" roll no   total marks    percentage ");
                for(int x=0;x<row;x++)
                {
                        for(int y=0;y<col;y++)
                        {
                                System.out.print(a[x][y] +" ");
                        }
                        System.out.println("");
                }
                sc.close();
        }
}
```

Output:

Enter row & col in matrix

3

```
3
enter values in matrix
1
20
80
2
21
75
3
19
85

matrix before sort
rollno   totalmarks    percentage
1        20       80
2        21       75
3        19       85

values after sort
rollno   totalmarks    percentage
3        19       85
1        20       80
2        21       75
```

14.8. Program to perform multiplication using two dimensional array

```
import java.util.Scanner;

public class MatrixMultiplication {
        public static void main(String[] args)  {
                Scanner sc=new Scanner(System.in);
                int row1,col1,row2,col2;        int i=0 , j=0,c;
                System.out.println("Enter row & col for first matrix");
                row1=sc.nextInt();
                col1=sc.nextInt();
                int a[][]=new int[row1][col1]; //initialized matrix
                System.out.println("Enter row & col for second matrix");
                row2=sc.nextInt();
                col2=sc.nextInt();
                int b[][]=new int[row2][col2]; //initialized matrix
        //
                if(col1!=row2)
                {
                        System.out.println("Matrix Multiplication not possible");
```

```
}
else
{
        int x[][]=new int[row1][col2];

        System.out.println("enter first matrix"); // entered values in first matrix ie a
        for(i=0;i<row1;i++)
        {
                for(j=0;j<col1;j++)
                {
                        a[i][j]=sc.nextInt();
                }
        }
        System.out.println("matrix A");// printed values of matrix a

        for(int k=0;k<row1;k++)
        {
                for(int m=0;m<col1;m++)
                {
                        System.out.print(a[k][m] +" ");
                }
        System.out.println("");
        }


        System.out.println("enter second matrix");//enterd values in 2nd matrix

        for(int l=0;l<row2;l++)
        {
                for(int m=0;m<col2;m++)
                {
                        b[l][m]=sc.nextInt();
                }
        }

        System.out.println("matrix B is  ");//displayed matrix
        for(c=0;c<row2;c++)
        {
                for(int d=0;d<col2;d++)
                {
                        System.out.print(b[c][d] +" ");
                }
        System.out.println("");
        }

        System.out.println("**********multiplication pf matrix is********* ");
        for(i=0;i<row1;i++)  //logic for multiplication
        {
```

```
                        for(j=0;j<col2;j++)
                        {
                                for(int y=0;y<row2;y++)
                                {
                                        x[i][j]= x[i][j]+(a[i][y]*b[y][j]);
                                }
                         System.out.print(x[i][j] + " ");
                        }
                System.out.println(" ");
                }
        }//else
    }//main
}//class
```

Output:

```
Enter row & col for first matrix
2
3
Enter row & col for second matrix
3
2
enter first matrix
4
3
6
2
7
5
matrix A
4 3 6
2 7 5
enter second matrix
4
8
6
9
4
2
matrix B is
4 8
6 9
4 2
**********multiplication pf matrix is*********
58 71
70 89
```

14.9. Program to determine diagonal of a matrix

```
import java.util.Scanner;

public class DiagonalMatrix {

	public static void main(String[] args) {
		Scanner sc =new Scanner(System.in);
		int i,j, row, col;


	   System.out.println("Enter row order:");
	   row=sc.nextInt();

	   System.out.println("Enter column order :");
	   col=sc.nextInt();

	   int a[][]=new int[row][col];

	   if(row==col)
	   {
		    int c[][]=new int[row][col];

		    System.out.println("enter values in matrix ");
		   for(i=0;i<row;i++)
		    {
			    for(j=0;j<col;j++)
			    {
				    a[i][j]=sc.nextInt();
			    }
		     }

		   System.out.println("your matrix is");

		   for(i=0;i<row;i++)
		    {
			    for(j=0;j<col;j++)
			    {
				    System.out.print(a[i][j] + " ");
			    }
		   System.out.println(" ");
		   }

		    for(i=0;i<row;i++)
		      {
			    for(j=0;j<col;j++)
			    {
				    if(i==j)
				    {
```

```
                                        c[i][j]=0;
                                }
                                else
                                {
                                        c[i][j]=a[i][j];
                                }
                        }
                }

                  System.out.println("diagonal of your matrix is");
                 for(i=0;i<row;i++)
                  {
                        for(j=0;j<col;j++)
                        {
                                System.out.print(c[i][j] + " ");
                        }
                  System.out.println(" ");
                  }
            }//end if
            else
            {
                System.out.println("Diagonal can not be determined");
            }
            sc.close();
        }
}
```

Output:

```
Enter row order:
3
Enter column order :
3
enter values in matrix
1
2
3
4
5
6
2
3
4
your matrix is
1 2 3
4 5 6
2 3 4
diagonal of your matrix is
0 2 3
```

4 0 6
2 3 0

14.10. Program to find Transpose of a matrix

```
import java.util.Scanner;

public class TransposeMatrix {
	public static void main(String[] args)
	{
		Scanner sc =new Scanner(System.in);
		int i,j, row, col;

		 System.out.println("Enter row order:");
		 row=sc.nextInt();

		 System.out.println("Enter column order :");
		 col=sc.nextInt();

	    int a[][]=new int[row][col];
	    int c[][]=new int[col][row];

	    System.out.println("enter values in matrix ");

	    for(i=0;i<row;i++)
	    {
		for(j=0;j<col;j++)
		{
			a[i][j]=sc.nextInt();
		}
	    }

	    System.out.println("your matrix is");

	    for(i=0;i<row;i++)
	    {
		for(j=0;j<col;j++)
		{
			System.out.print(a[i][j] + " ");
		}
		System.out.println(" ");
	    }

	    /****** logic *******/
	    for(i=0;i<row;i++)
	    {
		for(j=0;j<col;j++)
		{
```

```
                        c[j][i]=a[i][j];
                }
        }

        System.out.println("Transpose of matrix is");
        for(i=0;i<col;i++)
        {
                for(j=0;j<row;j++)
                {
                        System.out.print(c[i][j] + " ");
                }
                System.out.println(" ");
        }
        sc.close();
    }
}
```

Output:

```
Enter row order:
2
Enter column order :
3
enter values in matrix
1
2
3
4
5
6
your matrix is
1 2 3
4 5 6
Transpose of matrix is
1 4
2 5
3 6
```

15. Sample Programs on Classes and Objects

15.1. Program to take student marks and calculate percentage and grade

```
import java.util.Scanner;
public class ArithmeticSwitch {
        public static void main(String[] args) {
                Scanner sc=new Scanner(System.in);
                int choice, a=0,b=0;
                int add,sub,mult;
```

```
double div;
do
{
System.out.println("1.Add\n2.Substract\n3.Multiply\n4.devide\n5.exit");
System.out.println("\nEnter yout choice");
choice=sc.nextInt();

switch(choice)
{
 case 1:
                System.out.println("-----Addition-----");
                System.out.println("enter value of a: ");
                a=sc.nextInt();

                System.out.println("enter value of b: ");
                b=sc.nextInt();
                add=a+b;
                System.out.println("Addition is " +add);
                break;

 case 2:
                System.out.println("-----Subtraction-----");
                System.out.println("enter value of a=");
                a=sc.nextInt();

                System.out.println("enter value of b=");
                b=sc.nextInt();
                sub=a-b;
                System.out.println("Subtraction is " +sub);
                break;
case 3:
                System.out.println("-----Multiplication-----");
                System.out.println("enter value of a=");
                a=sc.nextInt();

                System.out.println("enter value of b=");
                b=sc.nextInt();
                mult=a*b;
                System.out.println("Multiplication is " +mult);
                break;
 case 4:
                System.out.println("-----Division-----");
                System.out.println("enter value of a=");
                a=sc.nextInt();

                System.out.println("enter value of b=");
                b=sc.nextInt();
                div=(double)a/b;
```

```
                        System.out.println("division is " +div);
                        break;
                case 5:
                        System.out.println("Thank you...");
                        System.exit(0);
                        break;

                default:
                        System.out.println("U have entered wrong choice");
                                break;
                }
        }while(choice!=5);

        sc.close();
        }
}
```

Output:

```
enter english marks
78
enter maths marks
89
enter sci marks
67
total=234.0
per=78.0
A grade
```

15.2. Program using Constructor

```
public class student
{
        private int id;
        private String name;
        private float math, total;
        private float chem;
        private float phys;
        private float percent;
        private String grade;

        public student()
        {
                super();
        }
```

```
public student(int id, String name, float math, float chem, float phys)
{
	super();
	this.id = id;
	this.name = name;
	this.math = math;
	this.chem = chem;
	this.phys = phys;

	total=math+chem+phys;
	percent=(total/300)*100;

	if(percent>=75)
	{
		grade="A+";
	}
	else if(percent>=60)

	{
		grade="A";
	}
	else if(percent>=50)
	{
		grade="B";
	}
	else if(percent>=50)
	{
		grade="c";
	}
	else
	{
		grade="d";
	}

}

@Override
public String toString()
{
	return "student [id=" + id + ", name=" + name + ", math=" + math+ ", chem=" +
chem + ", phys=" + phys + ", percent=" + percent
			+ ", grade=" + grade + "]";
```

```
        }
        public static void main(String[] args) {
                student s1=new student(1,"Prashant",45,50,48);
                student s2=new student(1,"ila",98,99,99);
                student s3=new student();

                System.out.println(s1);
                System.out.println(s2);
                System.out.println(s3);
        }
}
```

Output:

```
student [id=1, name=Prashant, math=45.0, chem=50.0, phys=48.0, percent=47.666664, grade=d]
student [id=1, name=ila, math=98.0, chem=99.0, phys=99.0, percent=98.66667, grade=A+]
student [id=0, name=null, math=0.0, chem=0.0, phys=0.0, percent=0.0, grade=null]
```

```
public class medicine
        {
                private int id,quantity;
                private String name;
                private float price,amount;

                public medicine()
                {
                        super();
                }

                public medicine(int id, int quantity, String name, float price)
                {
                        super();
                        this.id = id;
                        this.quantity = quantity;
                        this.name = name;
                        this.price = price;

                        amount = quantity*price;
                }

                @Override
                public String toString()
                {
```

```
                return "medicine [id=" + id + ", quantity=" + quantity + ", name= "+ name +
", price=" + price + ",amount="+amount+"]";
        }

        public static void main(String[] args)  {
        medicine m1=new medicine(1,20,"Crocine",15);
        medicine m2=new medicine(2,20,"zandubalm",40);
        medicine m3=new medicine(3,25,"gelucil",10);

        System.out.println(m1);
        System.out.println(m2);
        System.out.println(m3);
        }

}
```

Output :

```
medicine [id=1, quantity=20, name= Crocine, price=15.0,amount=300.0]
medicine [id=2, quantity=20, name= zandubalm, price=40.0,amount=800.0]
medicine [id=3, quantity=25, name= gelucil, price=10.0,amount=250.0]
```

```
public class class_demo_employee  {
        private int emp_id;
        private String emp_name;
        private float emp_sal;

        public class_demo_employee()
        {
        super();
        }
        public class_demo_employee(int emp_id, String emp_name, float emp_sal) {
                super();
                this.emp_id = emp_id;
                this.emp_name = emp_name;
                this.emp_sal = emp_sal;
        }
        @Override
        public String toString()
        {
                return "class_demo_employee [emp_id=" + emp_id + ", emp_name="
                                + emp_name + ", emp_sal=" + emp_sal + "]";
        }
```

```
        public static void main(String[] args) {
                Scanner sc=new Scanner(System.in);
                class_demo_employee e1=new class_demo_employee();
                class_demo_employee e2=new class_demo_employee(2,"Ram",6000);
                class_demo_employee e3=new class_demo_employee(3,"sam",5500);

                System.out.println(e1);
                System.out.println(e2);
                System.out.println(e3);

                sc.close();
        }
}
```

Output :

```
class_demo_employee [emp_id=0, emp_name=null, emp_sal=0.0]
class_demo_employee [emp_id=2, emp_name=Ram, emp_sal=6000.0]
class_demo_employee [emp_id=3, emp_name=sam, emp_sal=5500.0]
```

15.3. Program on Bank(Menu Driven Program) using Object Array and using Switch case

```
public class bank {
        private int acc_no;
        private String name;
        private float balance,amount;

        public bank()
        {
                super();
                // TODO Auto-generated constructor stub
        }

        public bank(int acc_no, String name,float balance)
        {
                super();
                this.acc_no = acc_no;
                this.name = name;
                this.balance = balance;
        }

        @Override
```

```
	public String toString()
	{
		return "bank [acc_no=" + acc_no + ", name=" + name + ", balance=" + balance + ", amount=" + amount+ "]";
	}

	public void deposite(int amount)
	{
		System.out.println("you are depositing this amount " +amount);
		System.out.println("");

		if(amount<100)
		{
			System.out.println("you should deposite amount multiple of 100 ");
		}
		else if(amount%100!=0)
		{
			System.out.println("you should deposite amount multiple of 100 ");
		}
		else
		{
			System.out.println("your previous balance is :"+balance);
			System.out.println(" ");
			balance=balance+amount;
			System.out.println("your current balance is :"+balance);
			System.out.println(" ");
		}
	}

	public void withdraw(float amount)
	{
		System.out.println("your withdraw amount is :"+amount);
		System.out.println(" ");

		if(balance-amount<1000)
		{
			float x = balance-1000;
			System.out.println("insufficient balance  "+balance);
			System.out.println("you can withdraw amnt :"+x+"Rs");
			System.out.println(" ");
		}
		else if(amount<100)
```

```
            {
                System.out.println("you should withdraw amount multiple of 100 ");
            }
            else if(amount%100!=0)
            {
                System.out.println("you should deposite amount multiple of 100 ");
            }
            else
            {
                System.out.println("your previous balance is :"+balance+"Rs");
                System.out.println(" ");
                balance=balance-amount;
                System.out.println("you current balance is  "+balance+"Rs");
                System.out.println(" ");
            }
    }
    public static void main(String[] args) {
            int w,d,a=0;
            String n;

            float b;
            Scanner sc =new Scanner(System.in);
            System.out.println("**** Create New Account ****");
            System.out.println("** enter customer id **");
            a=sc.nextInt();
            System.out.println("** enter customer Name **");
            n=sc.next();
            System.out.println("** enter balance **");
            b=sc.nextFloat();

            bank b1=new bank(a,n,b);

            System.out.println("enter the amount to be deposited");
            d=sc.nextInt();
            b1.deposite(d);

            System.out.println("enter the amount to withdraw");
            w=sc.nextInt();
            b1.withdraw(w);

            sc.close();
    }
```

```
}
```

Output:

```
1.Create an Account
2.Display an Account
3.Search an Account
4.Delete an Account
5.Update an Account by ID
6.deposite
7.Withdraw
8.Exit
1
**** Create New Account ****
** enter customer id **
1
** enter customer Name **
pallavi
** enter balance **
50000
** Enter ur phone no **
9797979797
** enter your addres **
airoli
your account is created
1.Create an Account
2.Display an Account
3.Search an Account
4.Delete an Account
5.Update an Account by ID
6.deposite
7.Withdraw
8.Exit
2
Bank [acc_no=1, name=pallavi, addrs=airoli, balance=50000.0, ph_no=9797979797]
1.Create an Account
2.Display an Account
3.Search an Account
4.Delete an Account
5.Update an Account by ID
6.deposite
7.Withdraw
8.Exit
1
**** Create New Account ****
** enter customer id **
2
** enter customer Name **
```

```
pooja
** enter balance **
45000
** Enter ur phone no **
4545454545
** enter your addres **
rabale
your account is created
1.Create an Account
2.Display an Account
3.Search an Account
4.Delete an Account
5.Update an Account by ID
6.deposite
7.Withdraw
8.Exit
2
Bank [acc_no=1, name=pallavi, addrs=airoli, balance=50000.0, ph_no=9797979797]
Bank [acc_no=2, name=pooja, addrs=rabale, balance=45000.0, ph_no=4545454545]
1.Create an Account
2.Display an Account
3.Search an Account
4.Delete an Account
5.Update an Account by ID
6.deposite
7.Withdraw
8.Exit
3
1.search by account no
2.Search by phone number
enter your choice :
1
Enter account no.to search account
2
Bank [acc_no=2, name=pooja, addrs=rabale, balance=45000.0, ph_no=4545454545]
1.Create an Account
2.Display an Account
3.Search an Account
4.Delete an Account
5.Update an Account by ID
6.deposite
7.Withdraw
8.Exit
3
1.search by account no
2.Search by phone number
enter your choice :
2
```

```
Enter contact number to search account
9797979797
Bank [acc_no=1, name=pallavi, addrs=airoli, balance=50000.0, ph_no=9797979797]
1.Create an Account
2.Display an Account
3.Search an Account
4.Delete an Account
5.Update an Account by ID
6.deposite
7.Withdraw
8.Exit
2
Bank [acc_no=1, name=pallavi, addrs=airoli, balance=50000.0, ph_no=9797979797]
Bank [acc_no=2, name=pooja, addrs=rabale, balance=45000.0, ph_no=4545454545]
1.Create an Account
2.Display an Account
3.Search an Account
4.Delete an Account
5.Update an Account by ID
6.deposite
7.Withdraw
8.Exit
4
enter account no to delete account:
1
account deleted succesfuly :
1.Create an Account
2.Display an Account
3.Search an Account
4.Delete an Account
5.Update an Account by ID
6.deposite
7.Withdraw
8.Exit
2
Bank [acc_no=2, name=pooja, addrs=rabale, balance=45000.0, ph_no=4545454545]
1.Create an Account
2.Display an Account
3.Search an Account
4.Delete an Account
5.Update an Account by ID
6.deposite
7.Withdraw
8.Exit
5
enter account no to be updated :
2
** enter customer Name **
```

```
puja
** enter balance **
46000
1.Create an Account
2.Display an Account
3.Search an Account
4.Delete an Account
5.Update an Account by ID
6.deposite
7.Withdraw
8.Exit
```

15.4. Program on this keyoword to call constructor explicitly

```
public class ThisUseDemo {
        public static void main(String[]args) {
                Employee e1=new Employee();

                e1.display();
                System.out.println("Number of employees:"+Employee.getCount());
                Employee e2=new Employee(102,"Ram Giri");
                e2.display();
                System.out.println("Number of employees:"+Employee.getCount());
                }
}
class Employee {
         private int id;
        private String name;
        private double salary;
        private static int count=0;

        public static int getCount()
        {
                return count;
        }

        public  Employee()
        {
                this(101,"Amar Koli",56000); // calling constructor explicitly
        }
        public  Employee(int id,String name,double sal)
        {
                this.id=id;
      this.name=name;
                this.salary=sal;
                count++;
        }
```

```
        public Employee(int id,String name)
        {
                this(id,name,45000);
        }
         public void display()
         {
                System.out.println("\nEmployee Details : ");
                 System.out.println("Id : "+id);
                System.out.println("Name : "+name);
                System.out.println("Salary : "+salary);
         }

}
```

Output:

Employee Details :
Id : 101
Name : Amar Koli
Salary : 56000.0
Number of employees:1

Employee Details :
Id : 102
Name : Ram Giri
Salary : 45000.0
Number of employees:2

16. Programs on String handling

16.1. Program to find username from string.

```
import java.util.Scanner;

public class StringChartAtDemo {
        public static void main(String[] args) {
                Scanner sc=new Scanner(System.in);
                String username="";
                System.out.println("please enter valid email_id");
                String s=sc.next();

                for(int i=0;i<s.length();i++)
                {
                        if(s.charAt(i)=='@')
                        {
                                break;
                        }
                        else
```

```
                    {
                        username=username+s.charAt(i);
                    }
                } //end for
                System.out.println("Username is : "+username);
        }
}
```

Output:

please enter valid email_id
sijojohn.ppp@gmail.com
Username is : sijojohn.ppp

16.2. Program to find domain name from string.

```
public class IndexOfDemo {

        public static void main(String[] args) {
                String email="abc@codertechnologies.in";
                int index=email.indexOf('@');
                int last=email.lastIndexOf('.');
                System.out.println(email.substring(index + 1,last));
        }
}
```

Output:

codertechnologies

16.3. Program to find vowels in a String

```
public class FindVowelDemo {
        public static void main(String[] args) {
                String s="Coder Technologies, Vashi";

                char vowel[]={'a','e','i','o','u'};
                System.out.println(s);
      for(int i=0;i<vowel.length;i++)
      {
        for(int j=0;j<s.length();j++)
        {
                if(vowel[i]==s.charAt(j))
                {
                        System.out.println(s.charAt(j));
                        break;
                }
        }
```

```
    }
  }
}
```

Output:

Coder Technologies, Vashi
a
e
i
o

16.4. String palindrome

```
/* A string is palindrome if the string and its reverse is same*/
import java.util.Scanner;
public class PalindromeString {

                public static void main(String args[]){
                 String original, reverse = "";
                   Scanner in = new Scanner(System.in);

                System.out.println("Enter a string to check if it is a palindrome");
                 original = in.next();

                 int length = original.length();

                 for ( int i = length - 1; i >= 0; i-- )
                          reverse = reverse + original.charAt(i);

                 if (original.equals(reverse))
                          System.out.println("Entered string is a palindrome.");
                else
                           System.out.println("Entered string is not a palindrome.");
                }
}
```

Output:

Enter a string to check if it is a palindrome
dad
Entered string is a palindrome.

16.5. Program on split example

```
public class SplitDemo {
```

```
	public static void main(String[] args) {
		String s="my name is Shahrukh";
		String ss[]=s.split(" ");
		for(int i=0;i<ss.length;i++)
		{
			System.out.println(ss[i]);
		}
	}
}
```

Output:

my
name
is
Shahrukh

16.6. Program on reverse of words in a sentence

```
public class WordReverseDemo {
	public static void main(String[] args) {
		Scanner sc=new Scanner(System.in);
		String rev="";
		System.out.println(" Enter String");
		String s=sc.nextLine();

		String ss[]=s.split(" ");
		for(int i=ss.length-1;i>=0;i--)
		{
			rev=rev+ss[i]+" ";
		}
		System.out.println(s);
		System.out.println(rev);
	}
}
```

Output:

```
Enter String
India is my Country
India is my Country
Country my is India
```

16.7. Program on CompareTo method

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

```
                String s1="Hello";
                  String s2="HEllo";
                  String s3="ashu";
                  String s4="ashu";
                  System.out.println("s1==s2 or s1<s2 or s1>s2 : "+s1.compareTo(s2));
                  System.out.println("s1==s3 or s1<s3 or s1>s3 : "+s1.compareTo(s3));
                  System.out.println("s3==s4 or s4<s4 or s4>s4 : "+s3.compareTo(s4));
        }
}
```

Output:

s1==s2 or s1<s2 or s1>s2 : 32
s1==s3 or s1<s3 or s1>s3 : -25
s3==s4 or s4<s4 or s4>s4 : 0