# JAVA BASICS

**PROGRAM-1**

```
public class First {

	public static void main(String[] args) {

		int a=10,b=20;

		float f=20;

		char ch='A';

		String str1="Welcome";

		boolean bool=true;

		System.out.println(a+b);

		System.out.println(f);

		System.out.println(ch);

		System.out.println(str1);

		System.out.println(bool);

	}

}
```

**OUTPUT**

```
30
20.0
A
Welcome
True
```

**PROGRAM-2**

```
public class First {

	public static void main(String[] args) {

		int a=10,b=20;
```

```
        float f=20;
    double d=20.5;
        char ch='A';
        String str1="Welcome";
        boolean bool=true;
        System.out.println(a+b);
        System.out.println(f);
        System.out.println(ch);
        System.out.println(str1);
        System.out.println(bool);
        System.out.println(d);
        System.out.println("Addition="+(a+b));
        System.out.println("Float="+(f));
        System.out.println("Double="+d);
        System.out.println("character="+ch);
        System.out.println("String="+str1);
        System.out.println("Boolean="+bool);
}
}
```

**OUTPUT**

```
Float=20.0
Double=20.5
character=A
String=Welcome
Boolean=true
```

**PROGRAM-3**

```
public class First {


        public static void main(String[] args) {

                System.out.println("Welcome to \"java\"programming");

                System.out.println("w");

                System.out.print("h\n");
```

**OUTPUT**

```
Welcome to "java"programming
w
h
```

**PROGRAM-4**

```
public class First {

        public static void main(String[] args) {

                int a=9, b=2;

    System.out.println("Addition="+(a+b));

          System.out.println("Subtraction="+(a-b));

                System.out.println("Multiplication="+(a*b));

                System.out.println("Division="+(a/b));

                System.out.println("Modulus="+(a%b));

                }

}
```

**OUTPUT**

```
Addition=11
Subtraction=7
Multiplication=18
Division=4
Modulus=1
```

**PROGRAM-5**

```
public class First {

public static void main(String[] args) {

                    int a=9, b=2;

        System.out.println("Addition="+(a+b));

            System.out.println("Subtraction="+(a-b));

        System.out.println("Multipication="+(a*b));

        System.out.println("Division="+(a/b));

        System.out.println("Modulus="+(a%b));

            System.out.println("a++="+(a++));//incrementation takes place in next line ie, post.it is same
for decrementation

            System.out.println("a="+a);

            System.out.println("++a="+(++a));//incrementation takes place in same line itself.

        System.out.println("--b="+(--b));

            System.out.println("b--="+(b--));

            System.out.println("b="+b);

                        }

         }
```

**OUTPUT**

```
a=10
++a=11
--b=1
b--=1
b=0
```

**RELATIONAL OPERATORS :**

**PROGRAM-6**

```
public class Relational {


        public static void main(String[] args) {

                int a=10, b=20;

    System.out.println(a==b);

          System.out.println(a!=b);

                System.out.println(a>b);

                System.out.println(a<b);

                System.out.println(a>=b);

                System.out.println(a<=b);

        }

}
```

**OUTPUT**

```
true
false
true
false
true
```

**PROGRAM-7**

```
public class Relational {

        public static void main(String[] args) {

                int a=20,b=5,c=2;

    System.out.println(a>b&&a>c);//true and true

          System.out.println(b>a||b>c);//false || true
```

```
        System.out.println(!(a>b));//!true =false



        }

}
```

**OUTPUT**

```
true
true
false
```

**PROGRAM-8**

```
public class Relational {



        public static void main(String[] args) {

                int a=20,b=5,c=2;

                a+=2;//a=a+2

                System.out.println("a="+a);

                b-=10;//b=b-10

                System.out.println("b="+b);

                c/=2;//c=c/2

                System.out.println("c="+c);

        }

}
```

**OUTPUT**

```
a=22
b=-5
c=1
```

**PROGRAM-9**

**//Bitwise and, or and xor**
**//increment and decrement**

```
public class Relational {

	public static void main(String[] args) {

		int a=5,b=2;

	System.out.println("a&b="+(a&b));//ans=0 because bitwise (and)(&) operation takes place

		System.out.println("a|b="+(a|b));//ans=7 because bitwise (or)(|)operation takes place

		System.out.println("a^b="+(a^b));//ans=7 because bitwise (xor)(^)operation takes place

		a=9;

		System.out.println("a=9 assigned"+a);//9

		a++;//a=a+1

		System.out.println("a++ increment="+a);//10

		System.out.println(a);

		b=5;

		System.out.println("b<<1="+(b<<1));//10

		System.out.println("b<<5="+(b<<5));//160

	}

}
```

**OUTPUT**

```
a=9 assigned9
a++ increment=10
10
b<<1=10
b<<5=160
```

**PROGRAM-10**

```
public class Relational{
	public static void main(String[] args) {
		int a=5,b=2,result;
		result=(a>b)?a:b;
		System.out.println("Biggest number="+result);//5

	}
}
```

**OUTPUT**

```
Biggest number=5
```

**PROGRAM-11**

```
//To find the greatest number between two variables

public class Relational{
	public static void main(String[] args) {
		int a=5,b=12;
		if(a>b)
		System.out.println("a is greater:"+a);//5>12=false
		else
		System.out.println("b is greater:"+b);//12>5=true
	}
}
```

**OUTPUT**

```
b is greater:12
```

**PROGRAM-12**

**//To find the greatest number among 3 variables**

```
public class Relational{
public static void main(String[] args) {
                    int a=5,b=12,c=2;
                    if(a>b && a>c)
                    System.out.println("a is greater:"+a);//false
                    else if(b>a && b>c)
                    System.out.println("b is greater:"+b);//true
                    else
                    System.out.println("c is greater:"+c);
          }
}
```

**OUTPUT**

```
b is greater:12
```

**PROGRAM-13**

**//To find the positive, zero and negative integer**

```
public class Relational{
          public static void main(String[] args) {
           int num=0;
           if(num>0)
                     System.out.println("positive number");
```

```
        else if (num==0)
                System.out.println("ZERO");
        else
                System.out.println("negative number");


       }
}
```

**OUTPUT**

ZERO

**PROGRAM-14**

**//To find the given number is even or odd.**

```
public class Relational{
        public static void main(String[] args) {
         int num=10;
         if(num%2==0)
                System.out.println("even number");
         else
                System.out.println("odd number");
        }
}
```

**OUTPUT**

even number

**PROGRAM-15**

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

```
        int x=1;//1
        while(x<=5) {
                System.out.println("x="+x);
           x++;
         }
}
}
```

**OUTPUT**

```
x=1
x=2
x=3
x=4
x=5
```

**PROGRAM-16**

**//do-while loop**

```
public class Relational{
        public static void main(String[] args) {
        int x=11;
        while(x<=10) {
                System.out.println(" while x="+x);
           x++;
         }
        do {
                System.out.println(" do x="+x);
           x++;
        }while(x<=10);
```

```
        }
}
```

**OUTPUT**

```
do x=11
```

**PROGRAM-17**

**//For Loop**

```
public class Relational{
        public static void main(String[] args) {
         for(int y=1;y<=5;y++) {
                System.out.println("for y ="+y);
        }
        }
}
```

**OUTPUT**

```
for y =1
for y =2
for y =3
for y =4
for y =5
```

**PROGRAM-18**

**//to get input from user**

```
import java.util.Scanner;
public class Relational{
        public static void main(String[] args) {
                Scanner s = new Scanner(System.in);
                int a;
```

```
            System.out.println("Enter the value of a:");
            a=s.nextInt();
            System.out.println("value of a is"+a);
        }
        }
```

**OUTPUT**

```
Enter the value of a:7
value of a is7
```

**PROGRAM-19**

**//to get two inputs from user**

```
import java.util.Scanner;
public class Relational{
        public static void main(String[] args) {
            Scanner s = new Scanner(System.in);
            int a,b;
            System.out.println("Enter the value of a:");
            a=s.nextInt();
            System.out.println("value of a is"+a);
            System.out.println("Enter the value of b:");
            b=s.nextInt();
            System.out.println("value of b is"+b);
        }
        }
```

**OUTPUT**

```
Enter the value of a:
3
value of a is3
```

```
Enter the value of b:
6
value of b is6
```

**PROGRAM-20**

**//to get string as an input from user**

```
import java.util.Scanner;

public class Relational{

	public static void main(String[] args) {

		Scanner s = new Scanner(System.in);

		String str1;

		System.out.print("enter the string:");

		str1=s.next();

		System.out.println("value of str is "+str1);

	}

	}
```

**OUTPUT**

```
enter the string:JAVA
value of str is JAVA
```

**PROGRAM-21**
**//To find the given number is tech number or not.**

```
import java.util.Scanner;

public class SUM1 {

	public static void main(String[] args) {

Scanner s = new Scanner(System.in);

System.out.print("enter the number:");

int a = s.nextInt();

int rem,q;
```

```
rem=a%100;
        q=a/100;
        int sum;
        sum=rem+q;
        if(sum*sum==a)
        {
                System.out.println(a+"is a tech number!");
        }
        else if(sum*sum!=a)
        {System.out.println(a+"is not a tech number!");
        }}}
```

**OUTPUT**

```
enter the number:1312
1312is not a tech number!
```

## SWITCH CASE AND FIBONACCI SERIES

Program-1

//To find the factorial of the number

```
packageClass_Program;

importjava.util.Scanner;

publicclass Factorial {

      publicstaticvoidmain(String[] args) {
            Scanner s=newScanner(System.in);
            intn=s.nextInt();
            intresult=1;
            for(inti=n;i>=1;i--)
            {
                  result=result*i;
            }
            System.out.println(result);
            s.close();

      }
```

```
}
```

Output

```
5
Factorial: 120
```

Program-2

// Fibonacci series

```
packageClass_Program;

importjava.util.Scanner;

publicclass Fibonacci {

	publicstaticvoidmain(String[] args) {
		Scanner s=newScanner(System.in);
		System.out.println("Enter the totoal number of generation");
		intn=s.nextInt();
		intf1=0,f2=1,f3;
		System.out.print(f1+" "+f2+" ");
		for(inti=3;i<=n;i++)
		{
			f3=f1+f2;
			System.out.print(f3+" ");
			f1=f2;
			f2=f3;
		}
s.close();
	}

}
```

Output

```
Enter the totoal number of generation
5
0 1 1 2 3
```

Program-3

```
//Program to find sum of natural number

packageClass_Program;

importjava.util.Scanner;

publicclass Sum1 {
```

```
	publicstaticvoidmain(String[] args) {
		Scanner s=newScanner(System.in);
		intn=s.nextInt();
		intresult=0;
		for(inti=1;i<=n;i++)
		{
			result+=i;
		}
		System.out.println("Sum = "+result);
		s.close();  }

}
```

Output

```
5
Sum = 15
```

Program-4

```
//Program to reverse the number

packageClass_Program;

importjava.util.Scanner;

publicclassSumOfDigits {

	publicstaticvoidmain(String[] args) {
		Scanner s=newScanner(System.in);
		intn=s.nextInt();
		intrem,sum=0;
		while(n>0)
		{
			rem=n%10;
			n=n/10;
			//sum=sum+rem;
			System.out.print(rem);
```

## PETERSON NUMBER

```
packageClass_Program;

importjava.util.Scanner;

publicclass Peterson_Number {

	publicstaticvoidmain(String[] args) {
		Scanner s = newScanner(System.in);
		System.out.println("Enter the number: ");
		intn=s.nextInt();
```

```
		int r,result=1,sum=0,temp=n;

		while(n>0)
		{
			r=n%10;
			result=1;
			for(int i=r;i>0;i--)
			{
				result=result*i;
			}

			sum=sum+result;
			n=n/10;
		}
		if(sum==temp)
		{
			System.out.println("Peterson Number");
		}
		else
		{
			System.out.println("Not a Peterson Number");
		}

		s.close();

	}

}
```

## OUTPUT:

```
Enter the number:
145
Peterson Number
```

## SUNNY NUMBER:

```
package Class_Program;

import java.util.Scanner;

public class Sunny_number {

	public static void main(String[] args) {
		Scanner s = new Scanner(System.in);
		System.out.println("Enter the number: ");
		int n=s.nextInt();
			double num =n+1;
			System.out.println("num= "+num);
			double squareroot = Math.sqrt(n+1);
			System.out.println("Squareroot number: "+squareroot);

		if((squareroot)%1==0)
```

```
		{
			System.out.println("Sunny number");
		}
		else
		{
			System.out.println("Not a Sunny Number");
		}
		s.close();
	}

}
```

## OUTPUT:

```
Enter the number:
80
num= 81.0
Squareroot number: 9.0
Sunny number
```

## SPY NUMBER:

```
packageClass_Program;

importjava.util.Scanner;

publicclassSpy_Number {

	publicstaticvoidmain(String[] args) {
		Scanner s = newScanner(System.in);
		System.out.println("Enter the number: ");
		intn=s.nextInt();
		intsum=0,product=1,rem;

		while(n>0)
		{
			rem=n%10;
			n=n/10;
			sum=sum+rem;
			product=product*rem;
		}
		if(sum==product)
		{
			System.out.println("Spy Number");
		}
		else
		{
			System.out.println("Not a Spy Number");
		}
		s.close();

	}
```

```
}
```

## OUTPUT:

```
Enter the number:
132
Spy Number
```

## AMSTRONG NUMBER:

```
packageClass_Program;

importjava.util.Scanner;

publicclassAmstrong_Number {

	publicstaticvoidmain(String[] args) {
		Scanner s = newScanner(System.in);
		System.out.println("Enter the number: ");
		intn=s.nextInt();
		intr,sum=0,temp=n;
		String str = String.valueOf(n);
		intl=str.length();
		while(n>0)
		{
			r=n%10;
			sum=(int) (sum + Math.pow(r, l));
			n=n/10;
		}
		if(sum==temp)
		{
			System.out.println("Amstrong Number");
		}
		else
		{
			System.out.println("Not an Amstrong Number");
		}
		s.close();

	}

}
```

## OUTPUT:

```
Enter the number:
153
Amstrong Number
```

## PATTERN PROGRAMS

**PROGRAM-1**

```
import java.util.Scanner;

public class Relational {

public static void main(String[] args) {

                        Scanner s = new Scanner(System.in);

                        System.out.print("enter the number:");

                        int n = s.nextInt();

                        for(int i=1;i<=n;i++) {

                                for(int j=1;j<=i;j++) {

                                        System.out.print("*");

                                }

                                System.out.println();

                        }

        s.close();

            }

    }
```

**OUTPUT**

```
enter the number:5

*

**

***
```

****

*****

**program-2**

```
import java.util.Scanner;

public class Relational {

		public static void main(String[] args) {

			Scanner s = new Scanner(System.in);

			System.out.print("enter the number:");

			int n = s.nextInt();

			for(int i=1;i<=n;i++) {

				for(int j=n;j>=i;j--) {

					System.out.print("*");

				}

				System.out.println();

			}

		s.close();

		    }

	}
```

**OUTPUT**

enter the number:5

*****

****

***

**

*

**program-3**

```
import java.util.Scanner;

public class number {

	public static void main(String[] args) {

Scanner s = new Scanner(System.in);

System.out.print("enter the number:");

int n = s.nextInt();

for(int i=1;i<=n;i++) {

for(int j=1;j<=i;j++) {

System.out.print("*");

}

System.out.println();

}

for(int i=2;i<=n;i++) {

for(int j=n;j>=i;j--) {

System.out.print("*");

}

System.out.println();

}

s.close();

}

}
```

**OUTPUT**

enter the number:5

*

**

***

****

*****

****

***

**

*

**program-4**

```
import java.util.Scanner;

public class number {

	public static void main(String[] args) {
                                                Scanner s = new Scanner(System.in);
                                                System.out.print("enter the number:");
                                                int n = s.nextInt();
                                                for(int i=1;i<=n;i++) {
                                                        for(int space=n;space>i;space--)
                                                                System.out.print(" ");
                                                  for(int j=1;j<=i;j++)
```

```
                                        System.out.print("* ");
                                                System.out.println();
                                        }
                                s.close();
                                    }
                        }
```

**OUTPUT**

```
enter the number:5
   *
  * *
 * * *
* * * *
* * * * *
```

**program-5**

```
import java.util.Scanner;
public class number {
        public static void main(String[] args) {
        Scanner s = new Scanner(System.in);
        System.out.print("enter the number:");
                int n = s.nextInt();
```

```
for(int i=1;i<=n;i++) {
for(int space=1;space<i;space++)
System.out.print(" ");
 for(int j=n;j>=i;j--)
System.out.print("* ");
System.out.println();
        }
    s.close();
}
                    }
```

**OUTPUT**

```
enter the number:5
* * * * *
 * * * *
  * * *
   * *
    *
```

**program-6**

```
import java.util.Scanner;
public class number {
    public static void main(String[] args) {
                                    Scanner s = new Scanner(System.in);
                                    System.out.print("enter the number:");
                                    int n = s.nextInt();
```

```
                for(int i=1;i<=n;i++) {
                        for(int space=n;space>i;space--)
                                System.out.print(" ");
                  for(int j=1;j<=i;j++)
                                System.out.print("* ");
                                        System.out.println();
                                }
                for(int i=2;i<=n;i++) {
                        for(int space=1;space<i;space++)
                                System.out.print(" ");
                  for(int j=n;j>=i;j--)
                                System.out.print("* ");
                                        System.out.println();
                                }
                        s.close();
                                }
        }
```

**OUTPUT**

```
enter the number:5
    *
   * *
  * * *
```

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

**program-7**

```
import java.util.Scanner;
public class number {
        public static void main(String[] args) {
Scanner s = new Scanner(System.in);
System.out.print("enter the number:");
int n = s.nextInt();
for(int i=1;i<=n;i++) {
for(int space=n;space>i;space--)
System.out.print(" ");
  for(int j=1;j<=n;j++)
System.out.print("* ");
System.out.println();
}
  s.close();
}          }
```

**OUTPUT**

```
enter the number:5
```

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

**program-8**

```
public class number {
	public static void main(String[] args) {
		Scanner s = new Scanner(System.in);
		System.out.print("enter the number:");
		int n = s.nextInt();
			for(int i=1;i<=n;i++) {
				for(int j=n;j>=i;j--) {
					System.out.print("*");
				}
					System.out.println();
				}
				for(int i=2;i<=n;i++) {
					for(int j=1;j<=i;j++) {
						System.out.println();
					}
					System.out.println();
				}}}
```

**OUTPUT**

enter the number:5

*****

****

***

**

*

**

***

****

*****

**program-9**

```
import java.util.Scanner;
public class number {
	public static void main(String[] args) {
                                                Scanner s = new Scanner(System.in);
                                                System.out.print("enter the number:");
                                                int n = s.nextInt();
                                                        for(int i=1;i<=n;i++) {
                                                          for(int j=1;j<=n;j++) {
                                                                if(i==1||i==n || j==1 ||j==n)
                                                                        System.out.print("*");
                                                                else
                                                                        System.out.print(" ");
                                                          }
```

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

**OUTPUT**

```
enter the number:5
*****
*    *
*    *
*    *
*****
```

**program-10**

```
import java.util.Scanner;
public class number {
        public static void main(String[] args) {
                                        Scanner s = new Scanner(System.in);
                                        System.out.print("enter the number:");
                                        int n = s.nextInt();
                                                for(int i=1;i<=n;i++) {
                                                  for(int j=1;j<=i;j++) {
                                                        System.out.print(j);
                                                  }
                                                  System.out.println();
                                                        }}}
```

**OUTPUT**

enter the number:5

1

12

123

1234

12345

**program-11**

```
import java.util.Scanner;
public class number {
public static void main(String[] args) {
                                        Scanner s = new Scanner(System.in);
                                        System.out.print("enter the number:");
                                        int n = s.nextInt();
                                                for(int i=1;i<=n;i++) {
                                                   for(int j=1;j<=i;j++) {
                                                           System.out.print(i);
            }
                                                   System.out.println();
                                                           }}}
```

**OUTPUT**

enter the number:5

1

22

333

4444

55555

**program-12**

```
import java.util.Scanner;

public class number {

        public static void main(String[] args) {

                                                Scanner s = new Scanner(System.in);

                                                System.out.print("enter the number:");

                                                int n = s.nextInt();

                                                for(int i=1;i<=n;i++) {

                                                   for(int j=n;j>=i;j--) {

                                                            System.out.print(j);

                                                            }

                                                               System.out.println();

                                                                        }}}
```

**OUTPUT**

```
enter the number:5

54321

5432

543

54

5
```

**program-13**

```
import java.util.Scanner;
```

```
public class number {
	public static void main(String[] args) {
Scanner s = new Scanner(System.in);
System.out.print("enter the number:");
int n = s.nextInt();
for(int i=n;i>=1;i--) {
   for(int j=1;j<=i;j++) {
System.out.print(j);
}
System.out.println();       }}}
```

**OUTPUT**

```
enter the number:5
12345
1234
123
12
1
```

**program-14**

```
import java.util.Scanner;
public class number {
	public static void main(String[] args) {
try (Scanner s = new Scanner(System.in)) {
System.out.print("enter the number:");
int n = s.nextInt();
```

```
int k=1;
for(int i=1;i<=n;i++) {
        for(int space=n;space>i;space--)
                System.out.print(" ");
   for(int j=1;j<=i;j++) {
        System.out.print(k++ + " ");

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

**OUTPUT**

```
enter the number:5
   1
  2 3
 4 5 6
 7 8 9 10
11 12 13 14 15
```

**program-15**

```
import java.util.Scanner;
public class number {
        public static void main(String[] args) {
                try (Scanner s = new Scanner(System.in)) {
                        System.out.print("enter the number:");
```

```
                int n = s.nextInt();
                for(int i=1;i<=n;i++) {
                        for(int space=n;space>i;space--)
                                System.out.print(" ");
                   for(int j=1;j<=i;j++)
                        System.out.print(j);
                   for(int k=i-1;k>=1;k--)
                        System.out.print(k);
                           System.out.println();
                                }}}}
```

**OUTPUT**

```
enter the number:5
    1
   121
  12321
 1234321
123454321
```

**program-16**

```
import java.util.Scanner;
public class number {
        public static void main(String[] args) {
                        try (Scanner s = new Scanner(System.in)) {
                System.out.print("enter the number:");
                int n = s.nextInt();
```

```
                                        char ch;
                                        for(int i=1;i<=n;i++) {
                                                ch='A';
                                           for(int j=1;j<=i;j++)
                                                System.out.print(ch++);
                                        }
                                                   System.out.println();
                                                        }
}}
```

**OUTPUT**

```
enter the number:5
A
AB
ABC
ABCD
ABCDE
```

**PROBLEM-17**

```
import java.util.Scanner;
public class problem7 {
        public static void main(String[] args) {
                try (Scanner s = new Scanner(System.in)) {
                        System.out.print("enter the number:");
                        int n = s.nextInt();
```

```
                    char ch;
                    for(int i=1;i<=n;i++) {
                            ch='A';
                            for(int space=n;space>i;space--)
                                    System.out.print(" ");
                      for(int j=1;j<=i;j++) {
                            System.out.print(ch++ + " ");
}
                              System.out.println();
                                    }}}}
```

**OUTPUT**

```
enter the number:5
   A
  A B
 A B C
A B C D
A B C D E
```

## OBJECTS AND METHODS

**program-1**

```
public class first {
        int stud_id=1; //class variable = state
        String stud_name="shalini";
        void print() {  //method
```

```
		System.out.println("student id : "+stud_id);
		System.out.println("student name : "+stud_name);
	}
	public static void main(String[] args) {
	 first obj = new first();
				obj.print();
	}}
```

**output**

```
student id : 1
student name : shalini
```

**program-2**

```
import java.util.Scanner;
public class first {
	int stud_id;
	String stud_name;
	void print(int id , String name) {
		stud_id = id;
		stud_name = name;
		System.out.println("student id : "+stud_id);
		System.out.println("student name : "+stud_name);
	}
	public static void main(String[] args) {
		try (Scanner s = new Scanner(System.in)) {
			System.out.print("Enter the student id :  ");
```

```
                        int id =s.nextInt();
                        System.out.print("Enter the student name : ");
                        String name=s.next();


        first obj = new first();
                         obj.print(id,name);  // calling the method print
s.close();
}
        }
}
```

**output**

```
Enter the student id :  1
Enter the student name : shalini
student id : 1
student name : shalini
```

**program-3**

**//private access modifier**

```
public class p {
        private int a=10;
        private int b=20;
        public static void main(String[] args) {
                p obj = new p();
                System.out.println("a="+obj.a);
                System.out.println("b="+obj.b);
```

```
	}
}
```

**output**

```
a=10
b=20
```

**program-3**

```
public class p {
	private int a=10; //private method visible only inside the class.
	private int b=20;
	void display() {  //default method it is visible to the whole package.
		System.out.println("a= "+a);
		System.out.println("b= "+b);
	}
	public class private_class{
		private int x=10;
		private int y=20;
	public static void main(String[] args) {
		p obj = new p();//trying to call the private variables outside the class which is not visible and not be accessed outside the class.
		private_class pc = new private_class();
		System.out.println("a="+obj.a);
		System.out.println("b="+obj.b);
		obj.display();
		System.out.println("x="+pc.x);
```

```
		System.out.println("y="+pc.y);
	}
}
}
```

output

a=10

b=20

x=10

y=20

**program-4**

```
package class_program;
public class sum1 {
	int x;  //class variable or global variable.
	void local_var() {
		int a=2;  //local variable
		a=a+7;
		System.out.println("a= "+a);
	}
	void print() {
		//System.out.println("a= "+a);//only visible inside the block becoz it is local variable
		System.out.println("x= "+x);
	}
	public static void main(String[] args) {
```

```
                sum1 s =new sum1();
                s.local_var();
                System.out.println("x = "+s.x);
        }}
```

**output**

a=9

x=0 //default value

**program-5**

**//Getter and Setter method**

```
package class_program;
public class sum2 {
    int emp_id;
    String emp_name;
    double salary;
    void setemp() {
            emp_id=1;
            emp_name="shalini";
            salary=10000;
    }
    void getemp() {
            System.out.println("empployee id : "+emp_id);
            System.out.println("employee name : "+emp_name);
            System.out.println("salary = "+salary);
    }
```

```
	public static void main(String[] args) {
		sum2 ob = new sum2();
		System.out.println("state emp_id :"+ob.emp_id);
		System.out.println("getter method calling");
		ob.getemp();
		System.out.println("setter method calling");
		ob.setemp();
		System.out.println("calling get method after set method:");
		ob.getemp();
	}
}
```

**output**

```
state emp_id :0
getter method calling
empployee id : 0
employee name : null
salary = 0.0
setter method calling
calling get method after set method:
employee id : 1
employee name : shalini
salary = 10000.0
```

**program-5**

```
package class_program;
```

```
public class sum3 {
	static int emp_id;
	static String emp_name;
	static double salary;
	static void setemp() {
		emp_id=1;
		emp_name="shalini";
		salary=10000;
	}
		void getemp() {
			System.out.println("employee id :"+emp_id);
			System.out.println("employee name : "+emp_name);
			System.out.println("salary : "+salary);
		}

	public static void main(String[] args) {
		sum3 ob = new sum3();
		System.out.println("state emp_id : "+emp_id);
			System.out.println("getter method calling");
			ob.getemp();
			System.out.println("setter method calling");
			setemp();
			System.out.println("calling get method after set method:");
			ob.getemp();
```

```
                    }
}
```

**output**

```
state emp_id : 0
getter method calling
employee id :0
employee name : null
salary : 0.0
setter method calling
calling get method after set method:
employee id :1
employee name : shalini
salary : 10000.0
```

**program-7**

```
package class_program;
public class sum4 {
                                int emp_id;
                                String emp_name;
                                double salary;
                               public sum4() {
                                        emp_id=1;
                                        emp_name="shalini";
                                        salary=10000;
                               }void getemp() {
```

```
                System.out.println("employee id :"+emp_id);
                System.out.println("employee name : "+emp_name);
                System.out.println("salary : "+salary);
        }
    public static void main(String[] args) {
        sum4 ob = new sum4();
        System.out.println("state emp_id : "+ob.emp_id);
            System.out.println("getter method calling");
            ob.getemp();
}}
```

**output**

```
state emp_id : 1
getter method calling
employee id :1
employee name : shalini
salary : 10000.0
```

**program-7**

```
package class_program;
import java.util.Scanner;
public class neon_number {
    public static void main(String[] args) {
        try (Scanner s = new Scanner(System.in)) {
            System.out.print("enter the number:");
            int n=s.nextInt();
```

```
int temp=n;
int sum=0;
n=n*n;
System.out.println("the square of the number is : "+n);
while(n!=0) {
int r=n%10;
n=n/10;
sum=sum+r;
}
System.out.println("num"+sum);
if(sum==temp)
System.out.println("The number is neon number");
else
        System.out.println("it is not a neon number");
}}}
```

**output**

1. enter the number:4025

the square of the number is : 16200625

num22

it is not a neon number

2. enter the number:9

the square of the number is : 81

num9

The number is neon number

**STRING CLASS , STRING BUFFER , STRING BUILDER**

**PROGRAM-1(sring class)**

```
public class string {
	public static void main(String[] args) {
		String str1;
		String str2=new String();
		String str3=new String("welcome");
		String str4;
		str1="india";
		str2="japan";
		str3="raju";
		System.out.println(str1);
		System.out.println(str2);
		System.out.println(str3);
		str4="today is monday and yesterday is sunday";
		System.out.println(str4.length());
		System.out.println("sudha".length());
		System.out.println(str4.charAt(4));
		System.out.println("india".equals("INDIA"));
		System.out.println("india".equalsIgnoreCase("INDIA"));
		System.out.println(str4.substring(8));
```

```
                System.out.println(str4.substring(8,15));
                System.out.println(str4.concat(str2));
                System.out.println(str4.replace('a','*'));
                System.out.println(str4.toUpperCase());
                String str5="hello";
                System.out.println(str5);
                System.out.println(str5.trim());
        }
}
```

**OUTPUT**

```
india
japan
raju
39
5
y
false
true
 monday and yesterday is sunday
 monday
today is monday and yesterday is sundayjapan
tod*y is mond*y *nd yesterd*y is sund*y
TODAY IS MONDAY AND YESTERDAY IS SUNDAY
```

hello

hello

**program-2**

**//(string buffer)**

```
public class string_buffer {

public static void main(String[] args) {

                StringBuffer s1=new StringBuffer();

                StringBuffer s2=new StringBuffer(20);//here 20 denotes capacity if it is given in
"" it is printed.

                StringBuffer s3=new StringBuffer("welcome");

                System.out.println(s1);

                System.out.println(s2);

                System.out.println(s3);

                System.out.println(s1.length());

                System.out.println(s1.capacity());

                s1.append("ashv  dkjcjieuwhdew oupwoediedjk disucjk" );

                System.out.println(s1);

                System.out.println(s1.length());

                System.out.println(s1.capacity());

                s1.setLength(5);

                System.out.println(s1.length());

                System.out.println(s1.capacity());

                System.out.println(s1);
```

```
                System.out.println(s1.reverse());
        }
}
```

**Output**

```
welcome
0
16
ashv  dkjcjieuwhdew oupwoediedjk disucjk
40
40
5
40
ashv
 vhsa
```

**PROGRAM-3**

**//(string compare  to)**

```
public class string_compareto {
        public static void main(String[] args) {
                String str="hello World";
                String anotherstring="hello world";
                Object objstr = str;
                System.out.println(str.compareTo(anotherstring));
                System.out.println(str.compareToIgnoreCase(anotherstring));
```

```
            System.out.println(str.compareTo(objstr.toString()));
        }
}
```

**OUTPUT**

-32(ASCII value for A=65;a=97)

0

0

**PROGRAM-4(String compare)**

```
public class stringcompare {
        public static void main(String[] args) {
                String s1="google";
                String s2="google";
                String s3= new String("google");
                System.out.println(s1.equals(s2));//compare only the values.
                System.out.println(s1==s2);//compare both the values and the datatypes.
                System.out.println(s2.equals(s3));
                System.out.println(s2==s3);
        }
}
```

**OUTPUT**

true

true

true

false

**PROGRAM-5**

**//(string occurence)**

```
public class string_occurence {

public static void main(String[] args) {

		String str0rig = "Hello world ,Hello Reader";

		int lastIndex = str0rig.lastIndexOf("Hello");

		if(lastIndex == -1)

		{

System.out.println("Hello not found");

	}

	else

		{

			System.out.println("Last occurence of Hello is at index " +lastIndex);

		}

	}

}
```

**output**

Last occurence of Hello is at index 13

**PROGRAM-6(string reverse**)

//(it can be done only in string buffer and builder not applicable to string class)

```
public class string_reverse {

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

```
                String string ="abcd 123";
                String reverse = new StringBuffer(string).reverse().toString();
                System.out.println("\n String before reverse : "+string);
                System.out.println("String after reverse : "+reverse);
        }
}
```

**output**

String before reverse : abcd 123

String after reverse : 321 dcba

**PROGRAM-7(string reverse-2method)**

```
//reverse in string
                String input = "abcdef";
                char[] n=input.toCharArray();
                for(int i = n.length-1;i>=0;i--)
                        System.out.print(n[i]);
```

**output**

fedcba

**PROGRAM-7(contains)**

```
String text = "The cat is on the table";
System.out.println(text.contains("the"));
```

**OUTPUT**

true//if the word is present in the text.

false// if the given word is not there in the text.

**NUMBER METHODS**

**PROGRAM-8**

```
public class number_method {
        public static void main(String[] args) {
                Integer x=10;
                Float f = x.floatValue();
                System.out.println("Integer x = "+x);
    System.out.println("Float value f = "+f)
}}
```

**OUTPUT**

Integer x = 10

Float value f = 10.0

**PROGRAM-9**

```
 String str = "10"; //primitive datatype
    //converting string into int
    Integer y =Integer.parseInt(str);
    Double d =y.doubleValue();
    System.out.println("y ="+y);
    System.out.println("d ="+d);
    System.out.println(d.toString());
    //converting int into string-class object typecasting.
    System.out.println(String.valueOf(y));
```

System.out.println(Math.abs(10-20)); **//display the difference**

System.out.println(Math.ceil(12.34)); **//higher value**

System.out.println(Math.floor(12.34)); **//lower value**

System.out.println(Math.round(12.34)); **//according to decimal**

System.out.println(Math.pow(2,3)); **//2 to the power 3**

System.out.println((int)Math.pow(2,3)); **//gives int value**

**OUTPUT**

y =10

d =10.0

10.0

10

10

13.0

12.0

12

8.0

8

**PROGRAM-10**

```
Integer num1=1;
Integer num2=10;
        System.out.println(num1.compareTo(num2));//gives number value.
        System.out.println(num1.equals(num2));//gives boolean value.
        String a ="hello";
```

```
        String b ="hello";
        if(a.equals(b))
                System.out.println("both strings are equal");
        if(a.compareTo(b)==0)
                System.out.println("both strings are equal");
        System.out.println(Math.min(12,20));//minimum value
        System.out.println(Math.max(12,20));//maximum value
    Integer int1 = 20;
        System.out.println(String.valueOf(int1));
        System.out.println(int1.floatValue());
        System.out.println(int1.doubleValue());
        System.out.println(Math.sqrt(81));
        }
```

**OUTPUT**

```
-1
false
both strings are equal
both strings are equal
12
20
20
20.0
20.0
```

9.0

# CHARACTER METHOD

**PROGRAM-1**

```
public class character_method {

public static void main(String[] args) {

System.out.println("5 is digit ="+Character.isDigit('5'));

System.out.println("a is letter ="+Character.isLetter('a'));

System.out.println("a is lower ="+Character.isLowerCase('a'));

System.out.println("a to lower ="+Character.toLowerCase('a'));

System.out.println("a is upper ="+Character.isUpperCase('a'));

System.out.println("a to upper ="+Character.toUpperCase('a'));

        }

}
```

**OUTPUT**

```
5 is digit =true

a is letter = true

a is lowercase =true

a to lowercase = a

a is uppercase =false

a to uppercase =A
```

**PROGRAM-2**

```
Scanner s=new Scanner(System.in);

                System.out.println();
```

```
String str1=s.next();
int digit=0,letter=0;
char ch[] = str1.toCharArray();
for(int i=0;i<ch.length;i++)
if (Character.isLetter(ch[i]))
  letter++;
else if (Character.isDigit(ch[i]))
        digit++;
System.out.println("Alphabets :"+letter);
System.out.println("Digits :"+digit);
```

**OUTPUT**

ABS5678YH

Alphabets :5

Digits :4

**PROGRAM-3**

```
Scanner s=new Scanner(System.in);
        System.out.println();
        String str1=s.next();
        int digit=0,letter=0,vowels=0,consonant=0;
        char ch[] = str1.toCharArray();
        for(int i=0;i<ch.length;i++)
        if (Character.isLetter(ch[i])) {
          letter++;
```

```
if(ch[i]=='a'||ch[i]=='e'||ch[i]=='i'||ch[i]=='o'||ch[i]=='u'||ch[i]=='A'||ch[i]=='E'||ch[i]=='I'||ch[
i]=='O'||ch[i]=='U') {
                        vowels++;}
                  else {
                        consonant++;
                  }
                }
                else if (Character.isDigit(ch[i]))
                        digit++;
                System.out.println("Alphabets :"+letter);
                System.out.println("Digits :"+digit);
                System.out.println("Vowels:"+vowels);
                System.out.println("Consonant:"+consonant);
        }
}
```

**OUTPUT**

HELLO123

Alphabets :5

Digits :3

Vowels:2

Consonant:3

**PROGRAM-4**

```
try (Scanner s = new Scanner(System.in)) {
```

```
                System.out.println();
                String str1=s.next();
                int digit=0,letter=0,vowels=0,consonant=0,special=0;
                char ch[] = str1.toCharArray();
                for(int i=0;i<ch.length;i++)
                if (Character.isLetter(ch[i])) {
                  letter++;

if(ch[i]=='a'||ch[i]=='e'||ch[i]=='i'||ch[i]=='o'||ch[i]=='u'||ch[i]=='A'||ch[i]=='E'||ch[i]=='I'||ch[
i]=='O'||ch[i]=='U') {
                        vowels++;}
                  else {
                        consonant++;
                                                }
                }
                else if (Character.isDigit(ch[i]))
                        digit++;
                else {
                        special++;
                }
                System.out.println("Alphabets :"+letter);
                System.out.println("Digits :"+digit);
        System.out.println("Vowels:"+vowels);
        System.out.println("Consonant:"+consonant);
```

```
                System.out.println("special :"+special);
            }
        }
}
```

**OUTPUT**

```
hell0#1245-7(0
Alphabets :4
Digits :7
Vowels:1
Consonant:3
special :3
```

**PROGRAM-5**

```
import java.util.Scanner;
public class CHARACTER {
    public static void main(String[] args) {
        try (Scanner s = new Scanner(System.in)) {
            System.out.println();
            String str1=s.nextLine();
            int uppercase=0,lowercase=0,whitespace=0,
vowels=0,consonant=0,special=0;
            char ch[] = str1.toCharArray();
            for(int i=0;i<ch.length;i++)
          if (Character.isLetter(ch[i])) {
```

```
                if(Character.isUpperCase(ch[i])) {
                        if (uppercase==0)
                        uppercase=i+1;
                }
                if(Character.isLowerCase(ch[i])) {
                        if (lowercase==0)
                        lowercase=i+1;
                }

if(ch[i]=='a'||ch[i]=='e'||ch[i]=='i'||ch[i]=='o'||ch[i]=='u'||ch[i]=='A'||ch[i]=='E'||ch[i]=='I'||ch[
i]=='O'||ch[i]=='U')
                {
                  if(vowels==0)
                  vowels=i+1;}
                else if(consonant==0) {
                        consonant=i+1;
                }}
        else if(ch[i]==' ' && whitespace==0)
                whitespace=i+1;
                  else if(special==0)
                        special=i+1;
                System.out.println("capital letter :"+uppercase);
                System.out.println("small letter:"+lowercase);
                System.out.println("whitespace :"+whitespace);
```

```
                    System.out.println("Vowels:"+vowels);
                    System.out.println("Consonant:"+consonant);
                    System.out.println("special :"+special);
                   }
}
}
```

**OUTPUT**

```
Ac @eiZ 123_
capital letter :1
small letter:2
whitespace :3
Vowels:1
Consonant:2
special :4
```

**PROGRAM-6**

```
import java.util.Scanner;
public class odd {
        public static void main(String[] args) {
                                try (Scanner s = new Scanner(System.in)) {
                                        int n=s.nextInt();// 1 2 3 4 5
                                        int arr[]=new int[n];
                                        int odd[]=new int[n];//odd[]={0,0,0,0,0}
                                        int even[]=new int[n];
```

```
        for(int i=0;i<n;i++)
        { arr[i]=s.nextInt(); }
        for(int i=0;i<n;i++)
        { if(arr[i]%2==0)
        {
            even[i]+=arr[i]; }
        else { odd[i]+=arr[i]; }
        }
        System.out.println("Odd: ");
        for(int i=0;i<n;i++)
            if(odd[i]!=0)//prints odd number without zeros
            System.out.print(odd[i] +" ");
        System.out.println("\nEven: ");
        for(int i=0;i<n;i++)
    if(even[i]!=0)//prints even number without zeros
            System.out.print(even[i]+" ");
    }
    }}
```

**OUTPUT**

1

2

3

4

5

Odd:

1 3 5

Even:

2 4

**PROGRAM-7**

```
import java.util.Scanner;

public class odd {

public static void main(String[] args) {

                                        try (Scanner s = new Scanner(System.in)) {

                                                int n=s.nextInt();

                                                int arr[]=new int[n];

                                                int odd[]=new int[n];

                                                int even[]=new int[n];

                                                int even_index=0,odd_index=0;

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

                                                { arr[i]=s.nextInt(); }

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

                                                { if(arr[i]%2==0)

                                                {

                                                        even[even_index++]+=arr[i]; }

                                                else { odd[odd_index++]+=arr[i]; }

                                                }
```

```
                System.out.println("Odd: ");
                for(int i=0;i<odd_index;i++)
                //if(odd[i]!=0)//prints odd number without zeros
                        System.out.print(odd[i] +" ");
                System.out.println("\nEven: ");
                for(int i=0;i<even_index;i++)
        //if(even[i]!=0)//prints even number without zeros
                        System.out.print(even[i]+" ");
        }
        }}
```

**OUTPUT**

```
7
1 2 4 3 5 7 9
Odd:
1 3 5 7 9
Even:
2 4
```

**PROGRAM-8**

**//to find the given number is prime or not.**

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

```
            int n = s.nextInt();
        int flag=0;
        for(int i=2;i<=n/2;i++) {
        if(n%i==0) {
            flag=1;
            break;
        }
        }
            if(flag==0 && n!=1)
                System.out.println(n+" is a prime number");
            else if(n!=1)
                System.out.println(n+" is not a prime number");
    }
}
```

**OUTPUT**

99

99 is not a prime number

**PROGRAM-7**

**//TO FIND THE DUPLICATE ELEMENTS IN AN ARRAY**

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

```
int n = s.nextInt();
int arr[]=new int[n];
for(int i=0;i<n;i++) {
	arr[i]=s.nextInt();
}
for(int i=0;i<n-1;i++)
{
	for (int j=i+1;j<n;j++)
	{
		if(arr[i]==arr[j])
			System.out.print(arr[j]+" ");
	}
}}}
```

**OUTPUT**

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

**PROGRAM-8**

**//program to remove the duplicate number**

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

```
int n = s.nextInt();
int arr[]= new int[n];
int temp[]= new int[n];
int replaceIndex=0,i,j,flag;
for(i=0;i<n;i++) {
	arr[i]=s.nextInt();
}
//arrays.sort(arr);
temp[replaceIndex++]=arr[0];
for(i=0;i<n;i++) {
	flag=0;
	for(j=i+1;j<n;j++) {
		if(arr[j]!=arr[i]) {
			break;
		}
	}for(int k=0;k<replaceIndex;k++) {
		if(temp[k]==arr[i])
			flag=1;
	}
	if(flag==0)
		temp[replaceIndex++]=arr[i];
	//arr[replaceIndex++]=arr[i];
	i=j-1;
```

```
                }for(i=0;i<replaceIndex;i++)
                        System.out.println(temp[i]+" ");
        }
                        }
                }
```

**OUTPUT**

6

1 2 2 3 3 4

1

2

3

4

**PROGRAM-9**

```
import java.util.Scanner;
public class occurences {
        public static void main(String[] args) {
                Scanner s = new Scanner(System.in);
        System.out.println("enter the number of elements you want in array : ");
                int n = s.nextInt();
                int arr[]= new int[n];
                System.out.println("Enter all the elements: ");
                int count=0;
                for(int i=0;i<n;i++)
```

```
                arr[i]=s.nextInt();

System.out.println("Enter the element of which you want to "+"count number of occurences:
");

                int search = s.nextInt();

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

                if(arr[i]==search)

                        count++;

        }

        if(count>0)

    {System.out.println("number of occurences of the element : " +count);

                }

        else {

        System.out.println("number of occurences of the element : "+count);       }}}
```

**OUTPUT**

```
enter the number of elements you want in array :

5

Enter all the elements:

2 3 3 4 3

Enter the element of which you want to count number of occurences:

3

number of occurences of the element : 3
```

**PROGRAM-11**

```
import java.util.Scanner;
```

```
public class largest {
	public static void main(String[] args) {
		try (Scanner s = new Scanner(System.in)) {
			int n = s.nextInt();
			int arr[]=new int[n];
			for(int i=0;i<n;i++) {
				arr[i]=s.nextInt();
			}
			int max = arr[0];
			for(int i=0;i<n;i++)
			{
				if(max<arr[i])
				{
					max=arr[i];
				}
			}
			System.out.println("Largest element:"+max);
		}
		}}
```

**OUTPUT**

```
6
-5 10 33 -17 64 23
Largest element:64
```

Program-9

//program to find the second largest and smallest number in an array.

```
import java.util.Scanner;

public class smallest {

                  public static void main(String []args)
                  {
                      Scanner s =new Scanner(System.in);
                      int n;
                      System.out.print("Enter number of elements you want in
array : ");
                      n=s.nextInt();
                      int arr[]=new int[n];
                     System.out.println("Enter all the elements :");
                     for(int i=0;i<n;i++)
                     {
                         arr[i]=s.nextInt();
                     }

                     for(int i=0;i<n;i++)
                     {
                         for(int j=i+1;j<n;j++)
                         {
                             if(arr[i]<arr[j])    //i=0 and j=remaining
values.when if condition is satisfied swap takes place
                             {
                                 int temp=arr[i];//swapped elements stored in
temp.

                                 arr[i]=arr[j];
                                 arr[j]=temp;
                             }
                         }
                     }

                     System.out.println("Second Largest element is "+arr[1]);
                     System.out.println( "Smallest element is "+arr[n-1]);
                 }


}
```

output

```
Enter number of elements you want in array : 8
Enter all the elements :
2 5 1 4 8 7 0 6
Second Largest element is 1
Smallest element is 8
```

# TWO DIMENSIONAL ARRAY

## Program-1

```
//program to give input in a 2D array

package java1.java;

public class Matrix_example {

	public static void main(String[] args) {
		// a[][]=new int[3][3]
		int a[][]= {
				{1,2,3},
			{4,5,6},
			{7,8,9},
		};
		System.out.println("number of column : "+a[0].length);//column
		System.out.println("number of rows : "+ ""+a.length);//row
}
}
Output
number of column : 3
number of rows : 3


package java1.java;

public class Matrix_example {

	public static void main(String[] args) {
		// a[][]=new int[3][3]
		int a[][]= {
				{1,2,3},
			{4,5,6},
			{7,8,9},
		};

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

}
}
```

## Output

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

Program-2

```
//program to get input from the user for a 2D array

package java1.java;

import java.util.Scanner;

public class Matrix_example {

	public static void main(String[] args) {
		try (Scanner s = new Scanner(System.in)) {
			System.out.print("enter the row : ");
			int row=s.nextInt();
			System.out.print("enter the column : ");
			int col=s.nextInt();
			// a[][]=new int[3][3]
			int a[][]=new int[row][col];
			System.out.println("enter the matrix element one by one :
");
			for(int i=0;i<row;i++) {
				for(int j=0;j<col;j++) {
					a[i][j]=s.nextInt();
				}
			}
			System.out.println("completed");
		}
	}
}
```

Output

```
enter the row : 3
enter the column : 3
enter the matrix element one by one :
1 2 3 4 5 6 7 8 9
completed
```

program-3

```
//program to get input from the user for a 2D array and display it in matrix

package java1.java;

import java.util.Scanner;

public class Matrix_example {
```

```
	public static void main(String[] args) {
		try (Scanner s = new Scanner(System.in)) {
			System.out.print("enter the row : ");
			int row=s.nextInt();
			System.out.print("enter the column : ");
			int col=s.nextInt();
			// a[][]=new int[3][3]
			int a[][]=new int[row][col];
			System.out.println("enter the matrix element one by one :
");
			for(int i=0;i<row;i++) {
				for(int j=0;j<col;j++) {
					a[i][j]=s.nextInt();
				}
			}
			System.out.println("array matrix A elements : ");
			for(int i=0;i<row;i++) {
				for(int j=0;j<col;j++) {
					System.out.print(a[i][j]+" ");
		}
					System.out.println();
	}
}
	}}
```

Output

```
enter the row : 3
enter the column : 3
enter the matrix element one by one :
1 2 3 4 5 6 7 8 9
array matrix A elements :
1 2 3
4 5 6
7 8 9
```

Program-4

```
//program to get two matrix from the user and addition of two matrices.

package java1.java;
import java.util.Scanner;
public class Matrix_example {

	public static void main(String[] args) {
		try (Scanner s = new Scanner(System.in)) {
			System.out.print("enter the row : ");
			int row=s.nextInt();
			System.out.print("enter the column : ");
			int col=s.nextInt();
			// a[][]=new int[3][3]
			int a[][]=new int[row][col];
			// b[][]=new int[3][3]
			int b[][]=new int[row][col];
```

```
                        // c[][]=new int[3][3]
                        int c[][]=new int[row][col];
                        System.out.println("enter A matrix : ");
                        for(int i=0;i<row;i++) {
                              for(int j=0;j<col;j++) {
                                    a[i][j]=s.nextInt();
                              }
                        }
                        System.out.println("enter B matrix : ");
                        for(int i=0;i<row;i++) {
                              for(int j=0;j<col;j++) {
                                    b[i][j]=s.nextInt();
                              }
                        }
                        System.out.println("array matrix A elements : ");
                        for(int i=0;i<row;i++) {
                              for(int j=0;j<col;j++) {
                                    System.out.print(a[i][j]+" ");
                              }     System.out.println();
                        }
                              System.out.println("array matrix B elements : ");
                              for(int i=0;i<row;i++) {
                                    for(int j=0;j<col;j++) {
                                          System.out.print(b[i][j]+" ");
                        }
                                    System.out.println();
                              }
                                    System.out.println("array matrix C elements :
");
                                    for(int i=0;i<row;i++) {
                                          for(int j=0;j<row;j++) {
                                                c[i][j]=a[i][j]+b[i][j];
                                                System.out.print(c[i][j]+" ");
                                          }
                                          System.out.println();




      }}
}
      }
```

*Output*

```
enter the row : 3
enter the column : 3
enter A matrix :
1 2 3 4 5 6 7 8 9
enter B matrix :
10 10 10 10 10 10 10 10 10
array matrix A elements :
1 2 3
4 5 6
```

```
7 8 9
array matrix B elements :
10 10 10
10 10 10
10 10 10
array matrix C elements :
11 12 13
14 15 16
17 18 19
```

Program-5

```
//program to get two matrix from the user and subtraction of two matrices.

package java1.java;
import java.util.Scanner;
public class Matrix_example {

	public static void main(String[] args) {
		try (Scanner s = new Scanner(System.in)) {
			System.out.print("enter the row : ");
			int row=s.nextInt();
			System.out.print("enter the column : ");
			int col=s.nextInt();
			// a[][]=new int[3][3]
			int a[][]=new int[row][col];
			// b[][]=new int[3][3]
			int b[][]=new int[row][col];
			// c[][]=new int[3][3]
			int c[][]=new int[row][col];
			System.out.println("enter A matrix : ");
			for(int i=0;i<row;i++) {
				for(int j=0;j<col;j++) {
					a[i][j]=s.nextInt();
				}
			}
			System.out.println("enter B matrix : ");
			for(int i=0;i<row;i++) {
				for(int j=0;j<col;j++) {
					b[i][j]=s.nextInt();
				}
			}
			System.out.println("array matrix A elements : ");
			for(int i=0;i<row;i++) {
				for(int j=0;j<col;j++) {
					System.out.print(a[i][j]+" ");
				}	System.out.println();
			}
				System.out.println("array matrix B elements : ");
				for(int i=0;i<row;i++) {
					for(int j=0;j<col;j++) {
						System.out.print(b[i][j]+" ");
			}
					System.out.println();
				}
					System.out.println("array matrix C elements :
");
```

```
                        for(int i=0;i<row;i++) {
                              for(int j=0;j<row;j++) {
                                    c[i][j]=a[i][j]-b[i][j];
                                    System.out.print(c[i][j]+" ");
                              }
                              System.out.println();




      }}
}
      }
```

Output

```
enter the row : 3
enter the column : 3
enter A matrix :
1 2 3 4 5 6 7 8 9
enter B matrix :
10 10 10 10 10 10 10 10 10
array matrix A elements :
1 2 3
4 5 6
7 8 9
array matrix B elements :
10 10 10
10 10 10
10 10 10
array matrix C elements :
-9 -8 -7
-6 -5 -4
-3 -2 -1
```

*Program-6*

```
// to find the area of circle with decimal points
package java1.java;

import java.util.Scanner;

public class circle {

      public static void main(String[] args) {
            Scanner s = new Scanner(System.in);
            float r =s.nextFloat();
      //    float r = n;
            float area = (float) (3.14*r*r);
            System.out.println(area);

      }

}
```

*//("%.2f",area)*

*Output*

*4*

*50.24*

*Program-7*

```
// to get two input a and b from the user and find a power b
package java1.java;

import java.util.Scanner;

public class circle {

	public static void main(String[] args) {
		Scanner s = new Scanner(System.in);
		int a=s.nextInt();
		int b=s.nextInt();
		int n;
		if(a<=5 && b<=50 ) {
			n = (int) Math.pow(a, b);

		System.out.println(n);

		}

	}

}

//splitting method
package java1.java;

import java.util.Scanner;

public class splittiing {

	public static void main(String[] args) {
		Scanner s = new Scanner(System.in);
		String str=s.nextLine();
		String str1[]=str.split(" ");
		int a =Integer.parseInt(str1[0]);
		int b = Integer.parseInt(str1[1]);
		if(a>=1 && a<=5 && b>=1 && b<=50)
		System.out.println((int)Math.pow(a,b));
	}

}
```

*Output*

*3 4*

*81*

Program-8

```
package java1.java;

import java.util.Scanner;

public class pythagoras {

	public static void main(String[] args) {
		Scanner s = new Scanner(System.in);
		int a=s.nextInt();
		int b=s.nextInt();
		int c=s.nextInt();
		 a =a*a;
		 b=b*b;
		 c=c*c;
		 if(a<=100000 && b<=100000 && c<=10000) {
		if(c==a+b) {
			System.out.println("yes");
		}
		else
			System.out.println("no");
		 }
```

**Splitting method**

```
Scanner s = new Scanner(System.in);
		String str=s.nextLine();
		String str1[]=str.split(" ");
		int a =Integer.parseInt(str1[0]);
		int b = Integer.parseInt(str1[1]);
		int c = Integer.parseInt(str1[2]);

		 if(a<=100000 && b<=100000 && c<=10000) {
		if(c*c==a*a+b*b) {
			System.out.println("yes");
		}
		else
			System.out.println("no");


	}}

}
```

Output

3 4 5

yes