

Output:

Entered the num1 value: 10

Entered the num2 value: 20

Sum of 10 and 20 = 30

Product of 10 and 20 = 200

Data types

Aim:- Write a java program which takes two numbers and prints sum and product of the given numbers.

Program:-

```
import java.util.Scanner;  
public class SumAndProductofInt  
{  
    public static void main(String []args)  
    {  
        int x,y,sum,product;  
        Scanner in = new Scanner(System.in);  
        System.out.print("Enter the num1 value: ");  
        x = in.nextInt();  
        System.out.print("Enter the num2 value: ");  
        y = in.nextInt();  
  
        sum = x+y;  
        System.out.println("sum of "+x+" and "+y+" = "+sum);  
        product = x*y;  
        System.out.println("product of "+x+" and "+y+" = "+product);  
    }  
}
```



Output:

Enter temperature in Fahrenheit: 100.5
Temperature in celsius: 38.055557

Converting 100.5 degrees Fahrenheit to Celsius
Result: 38.055557

Converting 38.055557 degrees Celsius to Fahrenheit
Result: 100.5

(Good) Input from user: 100.5

Output: 38.055557
("Good") Input from user: 38.055557
Output: 100.5
("Good") Input from user: 100.5
Output: 38.055557

"Input" = Get the "text" @ user's keyboard. Example:
"Output" = Print the "text" @ browser's keyboard.

Input = User's "text" @ browser's keyboard. Output = Browser's

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Input = User's "text" @ browser's keyboard. Output = Browser's



Scanned with OKEN Scanner

Data types

Aim: Write a java program which converts temperature from Fahrenheit to Celsius scale

Program:

```
import java.util.Scanner;  
public class TemperatureConverter {  
    public static void main (String [] args) {  
        float Fahrenheit, Celsius;  
        Scanner in = new Scanner (System.in);  
        System.out.print ("Enter temperature in Fahrenheit:");  
        Fahrenheit = in.nextFloat();  
        Celsius = (Fahrenheit - 32) * 5/9;  
        System.out.println ("Temperature in Celsius: " + Celsius);  
    }  
}
```



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Output:

Enter an Integer: 78
After Widening Values are:
Long Value: 78
Float Value: 78.0
Double Value: 78.0



Type casting

Aim: Write a java program to convert int to following data types:

- int to long
- long to float
- float to double
- print all the converted values

Program:

```
import java.util.Scanner;
public class Typeconversion{
    public static void main (String [] args){
        int i;
        long l;
        float f;
        double d;
        Scanner in = new Scanner (System.in);
        System.out.print ("Enter an Integer: ");
        i = in.nextInt();
        System.out.println ("After Widening values are: ");
        l = (long) i;
        System.out.println ("Long value: " + l);
        f = (float) (l);
        System.out.println ("Float value: " + f);
        d = (double) (f);
        System.out.println ("Double value: " + d);
    }
}
```

Output:

Enter a short value: 65
Original short value: 65
Converted char value: A

Type casting

Aim: Write a java program that allows users to enter keyboard shortcuts which are represented as short data types, and convert them to class char data types to display the corresponding characters.

Program:

```
import java.util.Scanner;
public class shortTOcharConversion {
    public static void main (String [] args) {
        Scanner scanner = new Scanner (System.in);
        int x;
        short i;
        char ch;
        System.out.print ("Enter a short value: ");
        x = scanner.nextInt ();
        i = (short) (x);
        System.out.println ("Original short value: " + i);
        ch = (char) (x);
        System.out.println ("Converted char value: " + ch);
    }
}
```



Output:

Enter the weight of Object₁: 50.5

Enter the weight of Object₂: 30.6

Relation between object₁ and object₂:

Object₁ == Object₂ = false

Object₁ != Object₂ = true

Object₁ > Object₂ = true

Object₁ < Object₂ = false

Object₁ >= Object₂ = true

Object₁ <= Object₂ = false



Operators

Aim: Write a java program which takes weights of two metal boxes to categorise the metal blocks in different boxes based on their weight. Display a list which includes all relations between the weights.

Program:

```
import java.util.Scanner;
public class RelationalOperators {
    public static void main(String[] args) {
        float object1;
        float object2;
        Scanner in = new Scanner(System.in);
        System.out.print("Enter the weight of object 1: ");
        object1 = in.nextFloat();
        System.out.print("Enter the weight of object 2: ");
        object2 = in.nextFloat();
        System.out.println("Relation between object1 and object2:");
        System.out.println("object1==object2=" + (object1 == object2));
        System.out.println("object1!=object2=" + (object1 != object2));
        System.out.println("object1>object2=" + (object1 > object2));
        System.out.println("object1<object2=" + (object1 < object2));
        System.out.println("object1>=object2=" + (object1 >= object2));
        System.out.println("object1<=object2=" + (object1 <= object2));
    }
}
```



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operators

Aim: Write a java program that prints all real solutions to the quadratic ax^2+bx+c . Read in a,b,c and use the quadratic formula.

Programs:

```
import java.lang.Math;
import java.util.Scanner;
class realSolutions{
    public static void main(String[] args){
        int a,b,c;
        double check,sqrts,xoot1,xoot2,xoot3;
        Scanner in = new Scanner(System.in);
        System.out.print("Enter value for a: ");
        a = in.nextInt();
        System.out.print("Enter value for b: ");
        b = in.nextInt();
        System.out.print("Enter value for c: ");
        c = in.nextInt();
        check = (b*b - 4*a*c);
        sqrts = Math.sqrt(check);
        xoot1 = (-b + sqrts) / 2 * a;
        xoot2 = (-b - sqrts) / 2 * a;
        xoot3 = -b / 2 * a;
    }
}
```



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Output:

Enter value for a: 1

Enter value for b: 6

Enter value for c: 6

Real solutions are: -1.2679491984311228, -4.73205080756887,

```
if (check < 0){  
    System.out.println("No Real solutions");  
} else if (check == 0){  
    System.out.println("Real solutions are: "+x0+" , "+y0);  
} else{  
    System.out.println("Real solutions are: "+x0t1+", "+x0t2);  
}  
}  
}
```

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Operators

Aim: Write a java program that generates the first n numbers in the Fibonacci sequence in Recursive (with using recursion) and Non-recursive way (without using recursion), starting with the initial values of 0 and 1, and then prints them out.

Program:

```
import java.util.Scanner;
public class Fibonacci{
    public static int fibonacciRecursive(int n){
        if (n<=0){
            return n;
        }
        return fibonacciRecursive(n-1)+fibonacciRecursive(n-2);
    }

    public static int fibonacciIterative(int n){
        int a=0, b=1, c;
        if (n==0){
            return a;
        }
        for (int i=2; i<=n; i++){
            c=a+b;
            a=b;
            b=c;
        }
        return b;
    }
}
```

Output:

Entered the range: 10

Fibonacci Sequence (Recursive):

0 1 1 2 3 5 8 13 21 34

Fibonacci Sequence (Non-Recursive):

0 1 1 2 3 5 8 13 21 34



```
public static void main (String [] args) {  
    Scanner scanner = new Scanner (System.in);  
    System.out.print ("Enter the range: ");  
    int n = scanner.nextInt ();  
    System.out.println ("Fibonacci sequence (Recursive):");  
    for (int i=0; i<n; i++) {  
        System.out.print (fibonacciRecursive (i) + " ");  
    }  
    System.out.println ();  
    System.out.println ("Fibonacci sequence (Non-Recursive):");  
    for (int i=0; i<n; i++) {  
        System.out.print (fibonacciIterative (i) + " ");  
    }  
    System.out.println ();  
}
```

{

}

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Conditional Statements

Aim: Write a Java program that models an interview process with multiple rounds. The interview process consists of the following rounds. written test, group discussion, technical round, and HR round. The program should ask the candidate for their results at each stage and determine if they are eligible to proceed to the next round or if they should go home.

Program:

```
import java.util.Scanner;
public class InterviewProcess
{
    public static void main(String[] args)
    {
        Scanner scanner = new Scanner(System.in);
        System.out.print("Did you clear the written test? (yes/no): ");
        String result1 = scanner.nextLine();
        if (result1.equalsIgnoreCase("yes"))
            System.out.println("You are eligible for the group discussion round");
        System.out.print("Did you pass the group discussion round? (yes/no): ");
        String result2 = scanner.nextLine();
        if (result2.equalsIgnoreCase("yes"))
            System.out.println("You are eligible for the technical round");
        System.out.print("Did you pass the technical round? (yes/no): ");
    }
}
```



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Output:

Did you clear the written test? (yes/no): yes
You are eligible for the group discussion round.
Did you pass the group discussion round? (yes/no): yes
Did you pass the technical round?
You are eligible for the technical round? (yes/no): yes
Did you pass the technical round?
Congrats! You are eligible for the HR round.



```
String result3 = scanner.nextLine();
if(result3.equalsIgnoreCase("yes")){
    System.out.println("congrats! you are eligible for the
                      HR round");
}
else{
    System.out.println("Sorry, you can go home");
}
else{
    System.out.println("Sorry, you can go home");
}
}
}
}
```



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conditional statements

Aim: Write a java program that determines the areas of rectangle, square and a circle based on the user's choice.

Program:

```
import java.util.Scanner;
public class AreaCalculator {
    public static void main (String [] args) {
        Scanner scanner = new Scanner (System.in);
        System.out.println ("choose a shape:");
        System.out.println ("1. Rectangle");
        System.out.println ("2. Square");
        System.out.println ("3. Circle");
        System.out.println ("enter your choice (1/2/3): ");
        int choice = scanner.nextInt();
        switch (choice) {
            case 1:
                System.out.print ("Enter the length of rectangle:");
                double length1 = scanner.nextDouble();
                System.out.print ("Enter the width of rectangle:");
                double width1 = scanner.nextDouble();
                double area1 = length1 * width1;
                System.out.println ("The area of the rectangle is: " + area1);
            break;
        }
    }
}
```



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Output:

choose a shape:

1. Rectangle

2. square

3. circle

Enter your choice (1/2/3):

Enter your the length of the rectangle: 12

Enter the width of the rectangle: 13

The area of the rectangle is: 156.0



CASE 2:

```
System.out.print("Enter the side length of the square:");  
double side = scanner.nextDouble();  
double area2 = side * side;  
System.out.println("The area of the square is: " + area2);  
break;
```

CASE 3:

```
System.out.print("Enter the radius of the circle: ");  
double radius = scanner.nextDouble();  
double area3 = Math.PI * radius * radius;  
System.out.println("The area of the circle is: " + area3);  
break;
```

default:

```
System.out.println("Invalid choice. Please choose  
1, 2, or 3");
```

3

3

3



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Output:

Enter the end of the range: 10

2 3 5 7

conditional statements

Aim: Write a java program that prompts the user for an integer and then prints all the prime numbers up to that integer.

Program:

```
import java.util.Scanner;
public class PrimeNumbers{
    public static void main (String [ ] args) {
        Scanner sc = new Scanner (System.in);
        System.out.print ("Enter the end of the range: ");
        int n = sc.nextInt ();
        for (int i = 2; i <= n; i++) {
            int count = 0;
            for (int j = 1; j <= i; j++) {
                if (i % j == 0) {
                    count++;
                }
            }
            if (count == 2) {
                System.out.print (i + " ");
            }
        }
    }
}
```



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2D Arrays

Aim: Write a java program that calculates and displays the total price of all the medicines stored in a box. This box is divided into numRows and numcols columns. Each medicine inside the box has a label indicating its price.

Program:

```
import java.util.Scanner;
public class sumof2DArray {
    public static void main (String [] args) {
        Scanner sc = new Scanner (System.in);
        System.out.print ("Enter the no. of rows: ");
        int numRows = sc.nextInt();
        System.out.print ("Enter the no. of columns: ");
        int numcols = sc.nextInt();
        int [][] matrix = new int [numRows] [numcols];
        System.out.println ("Enter the prices of each medicine:");
        for (int i=0; i<numRows; i++) {
            for (int j=0; j<numcols; j++) {
                matrix [i] [j] = sc.nextInt();
            }
        }
    }
}
```



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Output:

Enter the no. of rows : 3

Enter the no. of columns : 3

Enter the prices of each medicine

856 698 547

693 574 693

569 658 547

Total amount: 5835



```
int sum=0;  
for (int i=0; i< numROWS; i++) {  
    for (int j=0; j < numCOLS; j++) {  
        sum = sum + matrix[i][j];  
    }  
}
```

```
System.out.println("Total amount: " + sum);
```

```
}
```

```
}
```

Output

cmd Args : madam

The given string madam is a palindrome



palindrome or not

Aim: Write a java program that receives one command argument and check whether the given argument is a palindrome or not.

Program:

```
import java.util.Scanner;
class PalindromeOrNot{
    public static void main(String[] args){
        Scanner sc = new Scanner(System.in);
        String a = args[0];
        String b = "";
        int n = a.length();
        for (int i = n - 1; i >= 0; i--) {
            b = b + a.charAt(i);
        }
        if (a.equals(b)) {
            System.out.println("The given string " + a + " is a palindrome");
        } else {
            System.out.println("The given string " + a + " is not a palindrome");
        }
    }
}
```



Output

Printing a message once:

command line args: Hello World!

Hello World!

Printing a message with a specified no. of times:

command line args: Hello World! 3

Hello World!

Hello World!

Hello World!



Method Overloading

Aim: Write a java program for implementing a feature in the chat application that allows users to send both single messages and broadcast messages to multiple recipients.

Program:

```

public class MessagePrinter{
    public static void printMessage(String message){
        System.out.println(message);
    }

    public static void printMessage(String message, int times){
        String Builder result = new String Builder();
        for (int i=0; i<times; i++) {
            result.append(message + "\n");
        }
        System.out.println(result);
    }

    public static void main (String [ ] args) {
        String message = args[0];
        if (args.length == 1) {
            printMessage (message);
        } else if (args.length == 2) {
            int times = Integer.parseInt(args[1]);
            printMessage (message, times);
        }
    }
}

```



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CONSTRUCTOR OVERLOADING

Aim: Write a java program that takes command line arguments and display orders for a fast-food restaurant.

Program:

```
class Order {
```

```
    String name;
```

```
    double price;
```

```
    String specialInstructions;
```

```
    public Order (String name) {
```

```
        this.name = name;
```

```
        this.price = 0.0;
```

```
        this.specialInstructions = "null";
```

```
    }
```

```
    public Order (String name, double price) {
```

```
        this.name = name;
```

```
        this.price = price;
```

```
        this.specialInstructions = "null";
```

```
    }
```

```
    public Order (String name, double price, String special  
    Instructions) {
```

```
        this.name = name;
```

```
        this.price = price;
```

```
        this.specialInstructions = specialInstructions;
```

```
}
```

```
void displayOrder () {
```

```
    System.out.println ("Order: ");
```

```
    System.out.println ("Item: " + name);
```

```
    System.out.println ("Price: $" + price);
```

```
    System.out.println ("Special Instructions: "  
        + specialInstructions);
```



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Output

cmd args: classic cheese burger 6.99 Extra ketchup and
no pickles
order:
item: classic cheese burger
price: \$6.99
special instructions: Extra ketchup and no pickles

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```
public class RestaurantOrderSystem {
    public static void main (String [] args) {
        String itemName = args[0];
        Order order;
        switch (args.length) {
            case 1:
                order = new Order(itemName);
                break;
            case 2:
                double price = Double.parseDouble(args[1]);
                order = new Order(itemName, price);
                break;
            case 3:
                double price = Double.parseDouble(args[1]);
                String specialInstructions = args[2];
                order = new Order(itemName, price, specialInstructions);
                break;
            default:
                System.out.println("Invalid number of arguments");
        }
        return;
    }
}
```

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Method overriding

Aim: Write a Java program that takes two arguments, principle and time and returns the value of simple interest offered by different banks.

Program:

```
class Banks
```

```
    float calculateInterest(float principle, int time) {  
        return 0;
```

```
}
```

```
} class SBI extends Banks
```

```
    private static final float INTEREST_RATE = 10.8f;  
    float calculateInterest(float principle, int time) {  
        return (principle * INTEREST_RATE * time) / 100;
```

```
}
```

```
} class ICICI extends Banks
```

```
    private static final float INTEREST_RATE = 11.6f;  
    float calculateInterest(float principle, int time) {  
        return (principle * INTEREST_RATE * time) / 100;
```

```
}
```

```
} class AXIS extends Banks
```

```
    private static final float INTEREST_RATE = 12.3f;  
    float calculateInterest(float principle, int time) {  
        return (principle * INTEREST_RATE * time) / 100;
```



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Output:

SBI cmdArgs: 1000 5

SBI rate of interest = 540.0

ICICI rate of interest = 580.0

AXIS rate of interest = 615.0



3

3

```
public class Test_OVERRIDING{  
    public static void main (String [] args){  
        Bank SbiBank = new SBT();  
        Bank ICICIbank = new ICICI();  
        Bank axisBank = new AXIS();  
        float principal = FIDAT.parseFloat(args[0]);  
        int time = Integer.parseInt(args[1]);  
        float result1 = SbiBank.calculateInterest(principal, time);  
        float result2 = ICICIbank.calculateInterest(principal, time);  
        float result3 = axisBank.calculateInterest(principal, time);  
    }  
}
```

3

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Inheritance

Aim: Write a Java program that receives input from the students and displays the student information.

Program:

class Person{

private String name;

private int age;

public Person (String name, int age){

this.name=name;

this.age=age;

}

public void displayDetails(){

System.out.println("Name: "+name);

System.out.println("Age: "+age);

}

class Student extends Person{

private int studentId;

public Student (String name, int age, int studentId){

super(name, age);

this.studentId=studentId;

}

public void displayStudentInfo(){

super.displayDetails();

System.out.println("Student ID: "+studentId);

}

3



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Output:

Cmd Args: John Smith 22 23456

Student Information

Name: John Smith

Age: 22

Student ID: 23456



```
public class university{  
    public static void main (String [] args){  
        String name = args[0];  
        int age = Integer.parseInt(args[1]);  
        int student_id = Integer.parseInt(args[2]);  
        Student student = new Student(name, age,  
                                      student_id);  
        System.out.println("Student Information");  
        student.displayStudentInfo();  
    }  
}
```

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OUTPUT:

Hello I am a motor cycle. I am a cycle with an engine.
My ancestor is a cycle. who is a vehicle with Pedels.

Inheritance

Aim: Write a java program implementing the concepts of super keyword.

program:

```
import java.util.*;
import java.io.*;
class Bicycle {
    String define_mec() {
        return "a vehicle with pedals";
    }
}
class Motorcycle extends Bicycle {
    String define_mec() {
        return "a cycle with a engine";
    }
    Motorcycle() {
        System.out.println("Hello I am a motorcycle I am "+define_mec());
        String temp = super.define_mec();
        System.out.println("My ancestor is a cycle who is "+temp);
    }
}
class UsingSuper {
    public static void main(String[] args) {
        Motorcycle m = new Motorcycle();
    }
}
```



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