

Input

In any programming language input means to feed some data into program. This can be given in the form of file or from command line. JAVA programming language provides a set of built-in methods to read given input and feed it to the program as per requirement.

Scanner Class

The Scanner class is used to get user input, and it is found in the *java.util* package. The Scanner class input of the primitive types like int, double, etc. and strings. It is the easiest way to read input in a Java program.

To create an object of Scanner class, we usually pass the predefined object *System.in*, which represents the standard input stream. We may pass an object of class File if we want to read input from a file.

To use the Scanner class, create an object of the class and use any of the available methods found in the Scanner class documentation. In our example, we will use the `nextLine()` method, which is used to read Strings:

Syntax: `variable = nextLine()` or `variable = nextInt()` or `variable = nextLong()` etc.

Some Common Input Scanner class Methods in Java Console environment:

Function	Purpose
<code>next()</code>	Reads a any String value from the user
<code>nextLine()</code>	Reads a String value from the user
<code>nextInt()</code>	Reads a integer value from the user
<code>nextFloat()</code>	Reads a float value from the user
<code>nextLong()</code>	Reads a long integer value from the user
<code>nextBoolean()</code>	Reads a Boolean value from the user
<code>nextBoolean()</code>	Reads a byte value from the user
<code>nextShort()</code>	Reads a short integer value from the user

Example

```
import java.util.Scanner;

class Main
{
    public static void main(String[] args)
    {
        int Roll;
        String Name;
        float Per;

        Scanner input = new Scanner (System.in);
        System.out.println ("Enter Roll Number : ");
        Roll = input.nextInt(); // Integer number input
        System.out.println ("Enter Student Name : ");
        Name = input.nextLine(); // Integer number input
        System.out.println ("Enter Percentage : ");
        Per = input.nextFloat(); // Integer number input
        // Output input by user
        System.out.println("Roll Number : " + Roll);
        System.out.println("Name: " + Name);
        System.out.println("Student Percentage is : " + Per);
    }
}
```

Output:

In any programming language output means to display some data on screen, printer or in any file. JAVA programming language provides a set of built-in functions to output required data. we can use **System.out.println** to display the value of **System.out**:

Some Common Output Method / Functions in Java of `System.out` class:

Function	Purpose
<code>void print(String s)</code>	Prints a string.
<code>void print(Object obj)</code>	Prints an object.
<code>void print(double d)</code>	Prints a double -precision floating-point number.
<code>void print(float f)</code>	Prints a floating-point number.
<code>void print(int i)</code>	Prints an integer.
<code>void print(char c)</code>	Prints a character.

`print()` The only difference between `println()` and `print()` method is that `println()` throws the cursor to the next line after **printing** the desired result whereas `print()` method keeps the cursor on the same line.

Type Casting

In Java, type casting is a method or process that converts a data type into another data type in both ways manually and automatically. The automatic conversion is done by the compiler and manual conversion performed by the programmer. In this section, we will discuss type casting and its types with proper examples.

1. Widening Type Casting
2. Narrowing Type Casting

1. Widening Type Casting

In Java Language Converting a lower data type into a higher one is called widening type casting. It is also known as implicit conversion or casting down. It is done automatically. It is safe because there is no chance to lose data.

`byte -> short -> char -> int -> long -> float -> double`

Example

```
public class TypeCasting{
    public static void main(String[] args){
        int numberInt = 24;
        double numberDouble = numberInt; // Automatic casting: int to double

        System.out.println("display Integer value is "+numberInt); // Outputs 9 4 bytes ocupied
        System.out.println("display double Value is "+numberDouble); // Outputs 9.0 8 bytes ocupied
    }
}
```

```
}
```

2. Narrowing Type Casting

In Java Converting a higher data type into a lower one is called narrowing type casting. It is also known as explicit conversion or casting up. It is done manually by the programmer. If we do not perform casting then the compiler reports a compile-time error.

```
public class NarrowingTypeCasting {
    public static void main(String[] args) {
        double numberDouble = 1939.5678;
        int numberInt = (int) numberDouble; // Manual casting: double to int

        System.out.println(myDouble); // Outputs 1939.5678
        System.out.println(myInt);    // Outputs 1939
    }
}
```

Some cases we input data different numeric data type like integer, long, float and double etc. but input data in string or text form and after input we have convert data into required different numeric data types there for in this situation example are following.

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

        int roll;
        float per;
        String text;

        Scanner input = new Scanner (System.in);

        System.out.print(" Enter Student Roll Number .... :");
        text = input.nextLine();
        roll = Integer.parseInt(text);

        System.out.print(" Enter Student Percentage ..... :");
        text = input.nextLine();
        per = Float.parseFloat(text);

        System.out.println(" Student Roll Number is s "+roll);
        System.out.println(" Student Percentage is "+per);
    }
}
```

Exercise

Theory Question

- Q1) what do mean by input data in programming.
- Q2) what is difference between the ***System.out.println()*** and ***System.out.print()***.
- Q3) what is Type Casting and its types in java languages.

Practical Question

Q1) Write a simple program of following using input and output methods/ functions:

Enter Student G.R Number:

Enter Student Name:

Enter Student Percentage:

Enter Student Class Section:

// Output below will display on the screen

Q2) Input a string "I Love Programming" using: ***next()*** and ***nextLine()*** Methods / Functions.

Q3) Write a program to input radius and calculate area of circle (Formula: Area = PI x Radius²).

Q4) Write name and purpose three input method of java language.

Objective MCQ's

1. Which of the following methods we can use to input any type of values?
 - a) `nextInt()`
 - b) `nextLine()`
 - c) `nextFloat()`
 - d) `nextShort()`
2. Which of the following operators we use concatenation in Java language?
 - a) `.` (dot)
 - b) `&`
 - c) `=`
 - d) `+`

3. Which of the following methods we can use to input any type of integer values?
 - a. nextInt()
 - b. nextLine()
 - c. nextFloat()
 - d. nextShort()

4. The automatic conversion is done by the compiler conversion.
 - a. Narrowing type casting.
 - b. Simple type casting.
 - c. Widening Type Casting
 - d. Automatic Type Casting

5. The Converting a lower data type into a higher one is called.
 - a. Narrowing type casting.
 - b. Simple type casting.
 - c. Widening Type Casting
 - d. Automatic Type Casting

6. Converting a higher data type into a lower one is called narrowing type casting. It is also known as.
 - a. Implicit conversion.
 - b. Simplest conversion.
 - c. Explicit Conversion.
 - d. Automatic conversion.

7. Which of the following methods we can use to input decimal point type of values?
 - a. nextInt()
 - b. nextLine()
 - c. nextFloat()
 - d. nextShort()

8. Which of the following methods we can use to 16 bit integer values?
 - a. nextInt()
 - b. nextLine()
 - c. nextFloat()
 - d. nextShort()