
Haaris Infotech
Driven by Technology
Java Full Stack
Week 2

# Agenda

**Objective**

**Become A Programmer**

## 01 Variables

Types of Variables, Type Casting

## 02 Conditional Branching

If-else-if, switch case, ternary operator

## 03 Looping Constructs

For Loop, while loop, doWhile loop.

## 04 Arrays

Single dimension, Two dimension, Looping, Nested Loops

# JAVA

## INTRODUCTION TO JAVA

An object-oriented, multi-threaded programming language developed by Stanford University Network (SUN) in 1991 by James Gosling, Patrick Naughton, Chris Warth, Mike Sheridon.

Designed to be small, simple & portable across different platforms as well as OS.

POPULARITY

1. Usage of Applets
2. Powerful Programming language constructs
3. Rich set of significant object classes

## Features of Java

Reason why Java is Famous

1. Platform Independent.
2. Simple & Powerful
3. Secure
4. Portable
5. Object-oriented
6. Robust
7. Multithreaded
8. Architecture-neutral
9. Interpreted & High Performance
10. Distributed
11. Dynamic

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# PROGRAMMING

## Basic Programming Constructs

- Data types & variables
- Operators
- Control Statements
- Arrays
- Strings

## Writing Program in Java

Java

Java programs are a collection of whitespace, identifiers, comments, literals, operators, separators, & keywords.

Whitespace → Java is a free-form language. It is not needed to follow any rules. (i.e.) The program can be written in one line. Whitespace is a space, tab, or new line.

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# PROGRAMMING

## DATATYPES & VARIABLES

Java is a very strongly typed language.

Java defines 4 types of data.

1. Integers → byte, short, int, & long.
2. Floating-Point → float, double.
3. Characters → char.
4. Boolean → True or False.

*What we Infer from Lab?*

1. *Valid Identifier Names*
2. *Variable Declaration*
3. *Variable Initialization*

**INTEGERS**

**long 64 bit -9,223,372,036,854,775,808 to +9,223,372,036,854,775,807**

**Int - 32 bit -2,147,483,648 to +2,147,483,647**

Java

| | | |
|---|---|---|
| **short** | **16 bit** | **-32,768 to + 32,767** |
| **byte** | **8 bit** | **-128 to +127** |

**FLOATING-NUMBERS**

| | | |
|---|---|---|
| **double** | **64 bit** | **1.7e-308 to 1.7e+308** |
| **float** | **32 bit** | **3.4e-308 to 3.4e+038** |

**Ex: float f=3.7f**

**CHARACTERS - ex: char c='a';**
**range of char is 0 to 65,535**

**BOOLEAN - ex: boolean b=true;**
**Only 2 possible values. TRUE or FALSE.**

# PROGRAMMING

## Type Conversion and Casting

**When one type of data is assigned to another type of variable, an automatic type conversion will take place if the following two conditions are met**

**1. The two types are compatible**

**2.The destination type is larger than the source type.**

Automatic type promotion –
for ex:

```
byte b=10;
byte c=2;

int a=b*c;
```

## Casting Incompatible Types

**To cast incompatible types**

**use (typecasting)**

**For ex:**

```
Int I=257;
byte b=(byte)I;
```

**** b will be equal to 1**
**(257 is divided by 256)and the remainder is assigned.**

```
int value = (int) 3.89;
```

*Output:* 3

# PROGRAMMING

Identifiers → class names, method names & variable names. Identifier can be descriptive sequence of LC or UC letters, numbers or anything valid.
Literals → A constant value is created by using a literal representation.
Comments → Display some message related to the program for understanding the program.
Separators → ( ), { }, [ ], ;, , .; -- are the most commonly used separators in java.

Java

Keywords → abstract, boolean, const, finally, int, public, this, return, throw, throws, implements, package, final, class, catch, byte etc.
These keywords cannot be used as names for a variable, class or method.

# PROGRAMMING

## OPERATORS

Java provides a rich operator environment. There are 4 groups of operators,

1. Arithmetic Operators
2. Relational Operator
3. Logical Operator

## OPERATORS

### Arithmetic Operators

| | | | | |
|---|---|---|---|---|
| +, | -, | *, | /, | %, |
| = | ++ | | -- | |
| += | -= | *= | /= | %= |

### Relational Operators

| | | | |
|---|---|---|---|
| == | != | > | < |
| >= | <= | | |

### Logical Operators

An operator used to create complex Boolean expressions.

| | | |
|---|---|---|
| && | \|\| | ! |

# PROGRAMMING

## CONTROL STATEMENTS

**If statement**

General Form

```
if (condition)
        statement
```

**If – else – if**

General Form

```
if (condition)
        statement
else
if (condition)
        statement
….
```

Ternary Operator

```
String s=2>3?"success":"failure";
```

Sample

```
public static void main(String[] args) {
int i=100;

if(i==100) {
  System.out.println(" is Hundred");
}
else if(i==200) {
  System.out.println("i is two Hundred");
}
}
```

# PROGRAMMING

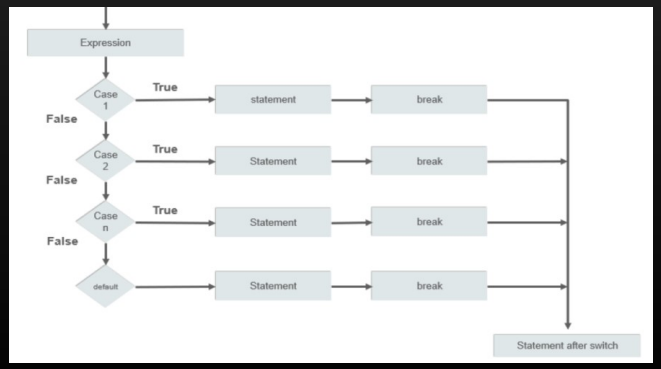
## CONTROL STATEMENTS

**Switch**

It is a branch statement.

General Form

```
switch (choice)
{
    case <value 1> :
        statements;
        break;
    .....
    default :
        default statement;
}
```




Sample

```
public static void main(String[] args) {
int i=100;

switch(i) {
  case 100:{
    System.out.println("value is Hundred...");
    break;
 }
   case 200:{
     System.out.println("value is Two Hundred...");
     break;
  }
    default:{
      System.out.println("The value is not valid..");
  }
}
```

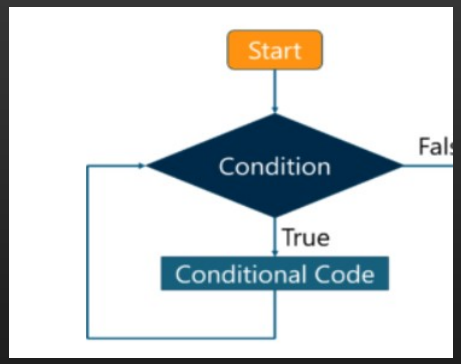
# PROGRAMMING

## CONTROL STATEMENTS

**While**

General Form

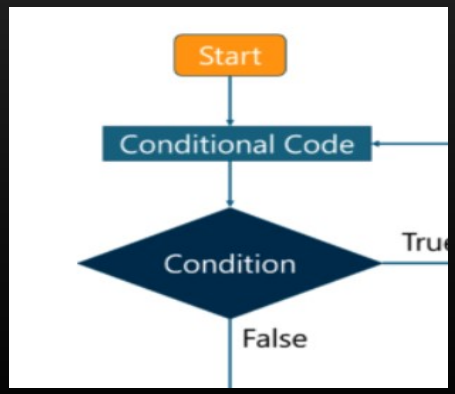
```
While (condition)
{
        body of loop
}
```




**Do-while**

General Form

```
Do
{
        body of loop
} while (condition);
```




Sample

```
public static void main(String[] args) {
int i=10;
while(i>0) {
--i;
System.out.println("value of i is...:"+i);
}
}
```

```
public static void main(String[] args) {
int i=10;
do {
--i;
System.out.println("value of i is...:"+i);
}while(i>0);
}
```

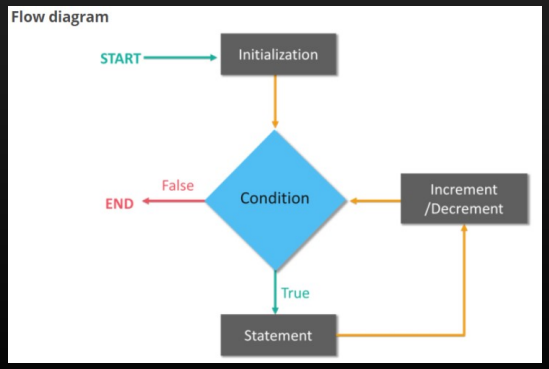
# PROGRAMMING

## CONTROL STATEMENTS

**For** loop

General Form

```
for (initialization; condition; iteration)
                {
                        body
                }
```




Sample

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

for(int i=10;i>0;i--) {
System.out.println("value of i..:"+i);
}
}
```

# PROGRAMMING

## CONTROL STATEMENTS

**Break**

**Continue**

Sample

```
public class Hotel
{
public static void main(String args[])
{
        a:{
        for(int i=0;i<10;i++)
        {
                b:{System.out.println(i);
                break a;
                //System.out.println(i);
                }
        }}
for(int i=0;i<10;i++)
        {
                if(i%2==0)
                {
                        continue;
                }
                System.out.print(i+":");
        }
}}
```

# PROGRAMMING

## Escape Sequence

\' – single quote
\" – double quote
\\ - backslash
\r – carriage return
\n – new line
\f – form feed
\t – tab
\b- backspace

Java

System.***out.println("Hello \n World");***

***Output***

***Hello***
***World***

# PROGRAMMING

## Arrays

Array is an object that stores a list of items of same data type.

In java, a variable to hold the array is declared, & a new object is created & assigned to it.

<data type> <array name> [] = new <data type> [size of the array];

<data type> <array name> [] = { array elements };

Java

```
public static void main (String args[])
{
int num[] = {21,5,78,56,59,23,19};
int n = num.length;
System.out.println ("The Numbers are : ");
for (int i=0;i<n ;i++)
{
        System.out.println (" "+num[i]);
}
```

# PROGRAMMING

## Arrays

### Multidimensional Arrays

<data type> <variable name> [] [] = new <data type> [row size of array] [column size of array];

EX

```
class Twod
{
public static void main(String args[]){
            int I = 0;
            int j = 0;
int matrix [][] = new int [3][3];
```

Java

```
for (int I = 0; i<3; i++)
   {
          for (int j = 0; j<3; j++)
            {
       System.out.println (" "+matrix [i] [j]+" ");
            }
    System.out.println (" ");
   }
}
}
```

# PROGRAMMING

## Arrays

### Multidimensional Arrays

<data type> <variable name> [] [] = new <data type> [row size of array] [column size of array];

EX

```
class Twod
{
public static void main(String args[]){
            int I = 0;
            int j = 0;
int matrix [][] = new int [3][3];
```

Java

```
for (int I = 0; i<3; i++)
   {
          for (int j = 0; j<3; j++)
            {
       System.out.println (" "+matrix [i] [j]+" ");
            }
    System.out.println (" ");
   }
}
}
```

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# THANK YOU

Concentrate – Understand - Practice

M.H. Shoiab