Basic Of Java Programming

Features Of Java :-

- o Java is an <u>object-oriented</u> programming language.
- o Java is open source.
- o Java is Platform Independent.
- o Java is designed for the distributed environment of the internet.

Java Language :-

- Character set
- Keywords
- User defined words
- Data types
- Variables
- Constants
- Literals
- Operators
- o Control Statements
- Arrays

Character set

- o Digits(0-9)
- Alphabets(A-Z, a-z)

Keywords

 Keywords are predefined code which has a specific meaning and that meaning cannot be changed. They are total 53 in number and cannot be used elsewhere.



List of Keywords

Data Types	Access Modifiers	Control Stmt	Object & classes	Modifiers	Exceptions
Byte	Private	Else	Class	Static	Try
Short	Protected	Switch	Interface	Abstract	Catch
Int	Public	Case	Extends	Synchronized	Finally
Long	Default	Default	Implements	Volatile	Throw
Float		For	This	Native	Throws
Double		While	Super	Transient	
Char		Do	New	Strictfp	
Boolean		Continue		Final	
		Break			
		Goto(reserved)			

User defied words

- They will be used as names to variables, methods, classes, etc. When you are defining user defined words, you need to remember the following point/rules:
 - User defined words can contain all the digits, all the alphabets and only two special Symbols, which are, '_'(underscore) and '\$'(dollar)
 - The first character must be an alphabet, underscore or dollar
 - Keywords can be used as user defined words.

Data Types

There are two categories of data types:

- Primitive data type
- User defined data type

Primitive data types

Primitive data types is a predefined type of data, and is supported by java. They are eight in Number.

A] Integral Data Types:-

I] Byte:-

- Bytes is 8-bit long (1 byte).
- Max value =127.
- Min value = -128.
- For eg:- byte b=125 //Allowed

byte b=133 //Not Allowed. Exceeds range.



II] Short:-

- Short is 2-byte long(16 bits).
- Max size = $32767 (2^{15}-1)$.
- Min Size= -32768 (-2¹⁵).

III] Int:-

- Int is 4-bytes long(32 bits).
- Most commonly used.
- Max Size = $2,147,483,647 (2^{31}-1)$.
- Min Size = -2,147,483,646 (-2³¹).
- Ex. int a = 10, b = 5; //Allowed.

IV] Long:-

- Long is 8-byte long(64 bits).
- Max Size= 9,223,372,036,854,775,807 (2⁶³-1).
- Min Size= -9,223,372,036,854,775,806 (-2⁶³).
- It is used where int is not sufficient to store data.
- Ex. Calculate number of seconds in10 years. (10x365x24x60x60).

B] Floating Point Data type: -

1. Float:-

- Float data type is used for 5 to 6 decimal places of accuracy.
- Size-4 byte
- Range- -3.4e38 to +3.4e38
- Ex. float p= 5.18f//append f at the last

2. Double: -

- If we want 14 to 15 decimal places of accuracy, then we should go for double.
- Size-8 byte
- Range:- -1.7e38 to 1.7e38
- Ex. Double d=9.3254768.

C] Non-Numeric Data Type:-

1. Char:-

- Size- 2 byte
- Java uses *Unicode* to represent characters.
- It's range is 0 to 65,536
- Ex. char ch= 'S' //Value should be declared in single quotes



2. Boolean: -

- Size virtual machine dependent.
- It save only two values true and false.
- Ex. boolean b=true;boolean b = false;

Variable :-

- A variable in java is a selection of memory that contains or many contain a data value. Therefore, it can be said that is a name allotted to the location of memory.
- O Syntax:-

Data type var_name = value;

- o Example:-
- Int a;
- Int b = 20;

Types of variable :-

- Global Variable: -
 - Global variable should be declare with in the class directly but outside of any method or block or constructor.
 - Global variable will be created at the time of object creation and discard at the time of object discard.
 - Global variable also known as Instance variable or object level variable.

Static Variable: -

- If value of a variable is not change object to object then it's not recommended to declare variable as instance variable, we have to declare such type of variable at class level using static modifier.
- Static variable only single copy will be created at class level.
- Static variable is also known as class level variables.
- We can declare static variable using 'static' modifier.

Local Variable: -

- To meet temporary requirement of programmer we can declare variable inside a method or block or constructor such types of variables are called Local Variables.
- The only allowed modifiers for local variable are 'default' and 'final'. Public, private, protected, static are not allowed.
- Local variable's scope is limited to the method, block or constructor inside which it is defined.



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For example :-
public class Test
        {
                   Static int x=11; //Static Variable
           int y=10; //Global Variable
        public void m1()
           {
               int z=20;
                                 //Local variable
       Public static void main(String[] args)
                  Test t1=new Test();
                  System.out.println(x);//11
                  System.out.println(t1.y);//10
                  System.out.println(Test.x);//11
                 System.out.println(z);//Compile Time Exception
          }
}
```

Operators :-

- Operators are special symbols that perform operations.
- Listed below are the types of operators :
 - Arithmetic Operators (+,-,*,/,%)
 - Relational Operators (>,>=,<,<=)
 - Logical Operators (&&, | |, \)
 - Assign Operators (=,+=,-=,*=,/=,&=)
 - Increment / Decrement Operator (++,--)
 - Ternary Operator (?:)
 - Bitwise Operator (&,\,^)
 - Equality Operator (==,!=)
 - Unary Operator (\,++,--,~)
 - Shift Operator (>>,<<)</p>
 - Instance Of Operator (instanceof)
 - New Operator (new).



Practical Assesment

- ♣ Write a program to print "Hello World " on console and then print your name on separate line.
- Write a program to addition of two numbers.
- ♣ Write a program to read the number entered by user.
- ♣ Write a program to calculate Area of Ractangle.
- ♣ Write a program to calculate Area of Square.
- Write a program to calculate Area of Circle.
- Write a program to take three number from user & find the minimum & maximum. (By using ternary operators).
- ♣ Write a program to take two number from user & swap this two numbers.
- Write a program to convert given no. of days into months and days. (Assume that each month is of 30days)

Input: 69

Output: 2 month and 9 days.

- Write a program to convert seconds to hours/minutes/seconds.
- Write a program to print a percent sign % using printf.
- Write a program to show how to display ASCII code instead of character.

