

OOP Labsheet-1

Prof.R.Gururaj

Simple Java program and its working

```
class FirstJavaProgram
{
    public static void main(String args[])
    { System.out.println("This is my First Java Program");}
}
```

Compilation and Execution

> javac FirstJavaProgram.java

> java FirstJavaProgram

Output: This is my First Java Program

Java Class: The class forms the basis for object oriented programming in Java.

Class is a template for an object, and object is an instance of a class.

General form of a class:

```
class classname
{
    type instance-variable1;
    type instance-variable2;
    ....
    type instance-variableN;
}
```

type methodname1(parameter-list)

{ body }

.....

type methodnameN(parameter-list)

{ *body* }

}

Members of a class

instance variables

methods

A simple class:

class *Box*

{

int width;

int length;

int depth;

}

To instantiate an object of Box

```
Box myBox=new Box();
```

To access variables of an object

```
myBox.length=12;
```

Java Keywords:

abstract

boolean

break

byte

case

catch

char

class

const

continue

default

do

double

else

extends

final

finally

float

for

goto

if

implements import

instanceOf

int

interface	long	native	new	
package	private		protected	public
return	short	static	super	switch
synchronized	this	throw	throws	transient
try	void	volatile		while
true	false	null		

Java Identifiers- can contain all characters, numeric chars, in any case, '\$', '_'

but can't start with a numeric character, '-'(hyphen), '/' not allowed

Valid: length, length2, box_length, box\$length etc.

Invalid: 2length, my-box, box/length etc.

Java Control statements

'if' conditional statements

1) if statement

if (condition) statement;

2) if - else statement

if (condition) statement;

else statement;

if - else if - else

if (condition) statement;

else if(condition) statements;

else if(condition) statement;

.....

else statement;

for loop

```
for (initialization; condition; iteration)
```

```
    {   body  
    }
```

switch - case

```
int month;
```

```
...
```

```
switch (month) {
```

```
    case 1: System.out.println("January"); break;
```

```
    case 2: System.out.println("February"); break;
```

```
    case 3: System.out.println("March"); break;
```

```
    default: System.out.println("April and beyond");
```

```
}
```

while loop

```
while(expression){
```

```
    statements
```

```
}
```

do – while loop

```
do {
```

```
    statements
```

```
} while (booleanExpression);
```

Java Data Types

<i>Type</i>	<i>Size/Format</i>	<i>Description</i>
		(integers)
byte	8-bit	Byte-length integer
short	16-bit	Short integer
int	32-bit	Integer
long	64-bit	Long integer
		(real numbers)
float	32-bit	Single-precision floating point
double	64-bit	Double-precision floating point
		(other types)
char	16-bit Unicode character	A single character
boolean	true or false	A boolean value (true or false)

Java Literals

- Integer literals
- Floating-point literals
- Boolean literals
- Character literals
- String literals

Java Type conversion

- If two types are compatible, then Java will perform the conversion automatically.
- Ex: assign an *int* value to *long* *//widening*
- However not all types are compatible.
- Ex: Conversion from double to byte.

- ❑ We need to do casting for this conversion of incompatible types.

Java automatic Type conversion

It is done when following two conditions are met.

1. Two types are compatible
2. Destination type is larger than the source

Ex: Byte to int.

There is no auto conversion numeric types to char or Boolean.

Java automatic Type Promotion

```
byte a=40;
```

```
byte b=50;
```

```
byte c=100;
```

```
int d= a*b/c;
```

(byte/short/char) → int → long → float → double

Single-dimensional Arrays:

```
int[] arrayOfInts;
```

```
int[] arrayOfInts = new int[10];
```

```
elementType[] arrayName = new elementType[arraySize];
```

```
String[] arrayOfStrings = new String[10];
```

```
int intarray[]={2,5,6};
```

Two dimensional

```
int marks[] [] = new int[3][4];
```

Taking input from the user: Using Scanner class of util packages

```
int a,b; String s;  
Scanner sc=new Scanner(System.in);  
a=sc.nextInt();  
b=sc.nextInt();  
s=sc.next();  
System.out.println("Values are :"+a+ " " +b+ " "+s);
```

Exercise Problems:

Exercise 1: Write a Java program to convert temperature from Fahrenheit to Celsius degree.

Formula $(0^{\circ}\text{C} \times 9/5) + 32 = 32^{\circ}\text{F}$

Test Data

Input Fahrenheit value 212

Expected Output

Equivalent Celsius value 100

Exercise 2: Write a Java program to display the Diameter, Circumference and Area of a circle, if radius is given as input.

Test Data

Radius value: 6

Expected Output

Diameter of a circle : 12.0

Circumference of a circle: 37.68

Area of a Circle: 113.04

Exercise.3 Write a java program that has 2X4 2D array of integers as below.

1 2 3 4

10 20 30 40

Define, assign and then print the array elements.