Syllabus

API Classes

1* JUnit / Test NG

2* Ant Tool

3* Log4j

4* Html/CSS

5 - 6 classes

SELENIUM

1* Introduction to Selenium IDE & Selenium RC

2* Intro Selenium WebDriver

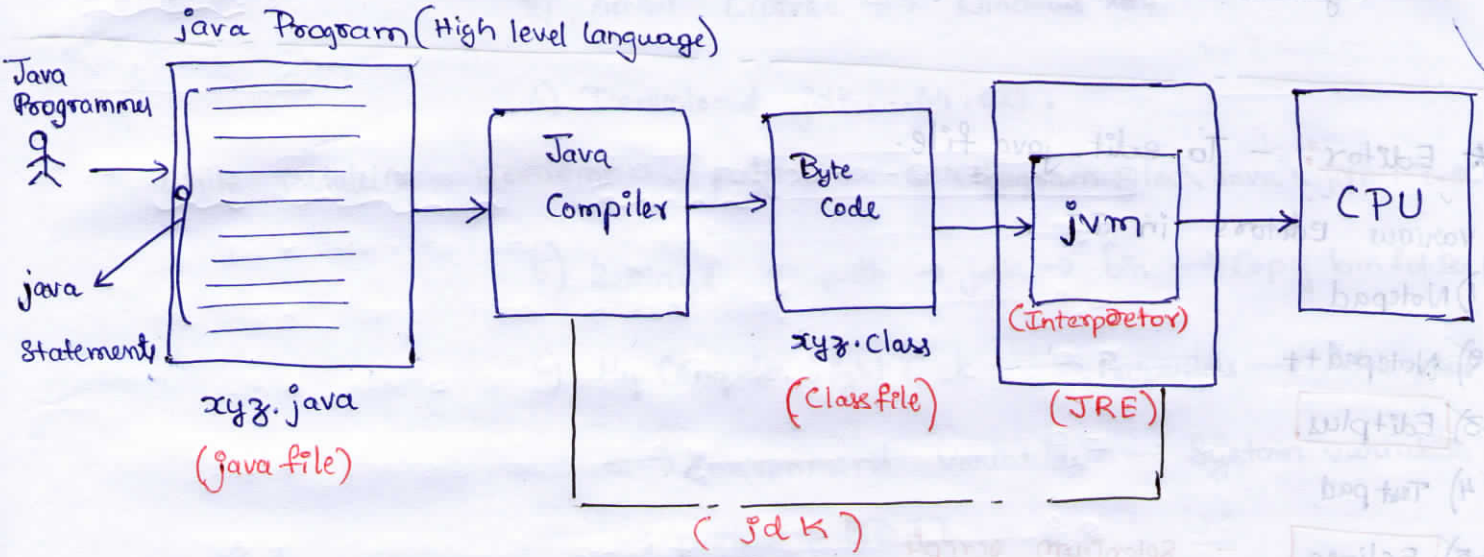
3* Frameworks

20 - 25 classes

08-01-2013 | Tuesday

CORE JAVA

CHAPTER 1 : BASICS



NOTES :

1) * All java statements are saved as javafile with extension '.java'.

2) * Java Compiler generates Classfile based on javafile.

3) * Class file contains bytecode, which is understood only by jvm [Java Virtual Machine].

4) * jvm is a interpretor, it converts byte code line by line into Machine Level Language (M.L.L) during execution.

5) * Java compiler and Jre (Java runtime Environment) together is called jdk.

6) * Java is platform independant i.e only needs classfile, only condition it needs jvm.

Interview Questions

1*) What is executable format of Java?

A: Bytecode i.e classfile (only need jvm, i.e Jre).

---

* **Editors:** - To edit java file.

various editors in IT :

1) Notepad
2) Notepad++
3) Editplus
4) Test pad
5) Eclipse - Selenium scripts
6) NetBeans

2*) **How To Install :**

Step1 : To Install 1) Editor - editplus
2) Java Compiler
3) Jre
] — Jdk [Java development Kit]

Step2: Version : jdk - 1.5
jdk - 1.6
jdk - 1.7 - latest

Step3: Types of Releases :

Selenium - 1) J2SE - Java 2 Standard Edition [Standalone, Client server applications]

2) J2EE - Java 2 Enterprise Edition [Web Applications]

3) J2ME - Java 2 Micro Edition [Mobile Applications]

Step 4: Install : 1) Google → jdk 1.7 download → Java SE Downloads

2) Java SE → Latest Release → Java Platform

3) Accept License → Windows X64

4) Download jdk...64.exe.

While installing remember path i.e C:\Program Files\Java\jdk1.7.0_01\

5) Settings → path → jdk → bin → Copy bin folder path

6) My Computer right click → Properties → Advanced → Environment Variables → System variables → path → EDIT

7) Variable Value → scroll to end → put ; & then paste copied bin folder path → OK ↵

6) Command prompt : java -version ↵

If errors: path error 'java' is not recognised as an internal or external Command (put ; and then paste correct path).

1*) Program Statements contains

1.1) Keywords

1.2) Identifier

1.3) Literals

2*) Keyword : * pre defined reserved word.

* All keywords in java are in lowercase.

Ex: int, if, switch, void, class, final

3*) Identifier : * are the names given/provided in program by programmer.

* Rules to be followed to give names:

* Keyword should not be used.

* Use alphanumeric characters.

* Always starts with Alphabets / starting character should be alphabet only.

Ex: 1) int age; } all variable names, method names, program names are identifiers

2) double salary1;

4*) Literals : * Values provided in program

Generally 3 types:

* numeric literals

* Character literals

* String literals.

5*) Developing a java program involves 3 steps

5.1) Coding

5.2) Compilation

5.3) Execution

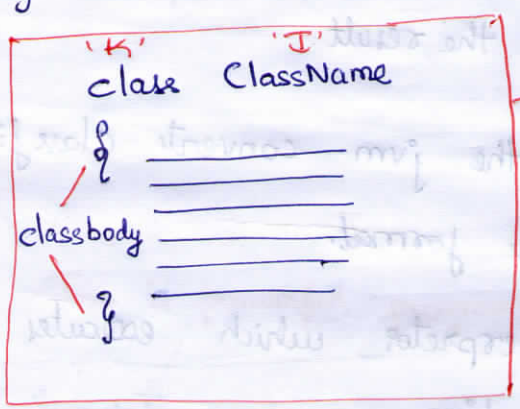
6*) Coding :

Writing a java program is known as Coding. Here we write programmes using java statements.

The program written should be saved with extension '.java'. This file is known as javafile.

A javafile should have class definition block.

The syntax to write class definition block is



Its by convention the classname should begin Upperaase. The java statements has to be written inside the class body.

7*) While saving the java program, the filename should be same as Classname.

8.*) Compilation :

8.1*) Is process of converting java file into class file.

8.2*) The class file containe bytecode.

8.3*) Java Compiler translates java statements into bytecodes at the time of compilation.

8.4*) Java Compiler generates the classfile and saves the classfile in the location where javafile is available.

8.5*) The Syntax to compile any javafile is

```
javac filename.java
```

9*) Execution :

9.1*) Running the classfile is known as execution.

9.2*) The jvm executes the bytecodes present in the classfile and gives the result.

9.3*) During execution the jvm converts classfile into CPU understandable format.

9.4*) Jvm is an interpretor which executes the statements line by line

9.5*) Syntax to execute classfile is

```
java classname
```

NOTE

10*) jvm starts execution only if java class containe main method otherwise jvm throws error.

11*) A java class which doesn't have a main method connot be executed.

12*) To compile a javafile change the working directory to location where javafile is saved.

Example:

1) P1:

```
class SampleProgram
{
  public static void main(String[] args)
  {
    System.out.println("Hi, Welcome to java");// displays the message on the screen, print new line char
    System.out.println("Java is powerful programming Language");
  }
}
```

O/p: Hi, Welcome to Java
Java is powerful programming Language

---

2) P2:

```
class SampleProgram1
{
  psvm(String[] args)
  {
    System.out.print("Hi, Welcome to java \n"); // \n is to print in newline
    System.out.print("Java is powerful programming language");
  }
}
```

P3:

```
class SampleProgram2
{
  psvm (String[] args)
  {
   System.out.println("Hi, Welcome Again " + "and again to Java");
                                    // '+' To join two String data with
                                       seperate " "
  }
}
```

O/P:-

Hi, Welcome again and again to Java

P4:

```
class Demo1
{
  psvm( )
  {
   Sop (10 + 10);      // here + adds 10+10 first and then
                          displays the result
  }
}
```

O/P:- 20

P5:

```
class Demo2
{
   psvm(String[] args)
   {
    Sop ("Program starts...");
    int id;  // declaration
    id = 2012345; //initialization
    Sop (id);  // prints id value
    Sop ("Program ends...");
   }
}
```

O/p:-

```
Program starts...
2012345
Program ends...
```

NOTE:- 13*) Before using a variable, we need to initialize, before initializing we need to declare the variable.

P6:

6)

```
class AssignProgram1
{
  public static void main(String[] args)
  {
    Sop("Program starts...");
    int num1;
    int num2;
    int sum;
    num1 = 10;
    num2 = 20;
    sum = num1 + num2;
    Sop(sum);
    Sop("Program ends...");
  }
}
```

O/p:

```
Program starts...
30
Program ends...
```

P7:

7)

```
class Demo4
{
  psvm( )
  {
    Sop("Program starts...");
    final int empID; // final
    empID = 12973;
    Sop("empID is "+empID);
    Sop("Program ends...");
  }
}
```

O/p:

```
Program starts...
empID is 12973
Program ends...
```

P8

8)

```
class Demo3
{
  psvm( )
  {
    Sop("Program starts...");
    double salary = 15000.98;
    Sop("Salary is "+salary);
    salary = 25128.54;
    Sop("Salary is "+salary);
    salary = 35978.54;
    Sop("Salary is "+salary);
    Sop("Program ends...");
  }
}
```

O/p:

```
Program starts
Salary is 15000.98
Salary is 25128.54
Salary is 35978.54
Program ends
```

14*) If we need to initialize a variable only once, the such variable has to be declared as final by using final keyword

11-01-2013 | Friday

Variables

15*) In java variables are used to store the data of programmes

16*) The variable has to be declared first before initializing. &

16.1*) The syntax to declare a variable

```
datatype Variablename;
```

17*) Datatype: indicates the type of value that we assign to the variable. Java supports 8 type of datatypes,

1. byte
2. short
3. int
4. long
5. float
6. double
7. char
8. boolean

NOTE 18*) In java there is no string variable. Inorda to store string value java provides a class String, StringBuffer & StringBuilder.

19*) Every variable has to be initialized before using in any operation. The syntax to initialize variable is

```
Variablename = value;
```

20*) If any variable is used without initialization, then compiler throws an error.

21*) A variable can have diff values initialized, throughout the program execution.

P9

9) class AreaOfCircle

```
{
psvm(String[] args)
 {
  Sop("Program starts...");
  final float PI;
  PI = 3.14f;
  double r;
   r = 2.5;
  float Area;
  Area = PI*r*r;
  Sop("Area of Circle" + Area);
  Sop("Program ends...");
 }
}
```

O/p: Program starts...
Area of Circle -
Program ends...

```
// float variablename = value f;
   long variablename = value l;

final double PI = 3.14;
   double radius = 10.0;
   double Area;
   Area = PI * radius * radius;
Sop("Area of Circle with radius " + radius + "is"
   + Area);
Sop("Program ends...");
}
}
```

P10

10) class AssignSimpleInterest

```
{
 psvm(String[] args)
 {
  Sop("Program starts...");
  double Interest;
  long Principle = 10000 l;
  double Rate = 0.15;
   int Time = 2;
   Interest = Principle * Rate * Time;
  Sop("The Simple Interest for " + Principle + " amount at the rate of "
      Rate + " for " + Time + " years duration is " + Interest);
  Sop("Program ends...");
 }
}
```

O/p:- Program starts...
The Simple Interest for 10000 amount at the rate of 15% for 2yrs
duration is 3000
Program ends...

11) P11

```
class AssignDegToFahrenheit
{
    psvm(String[] args)
    {
        Sop("Program starts...");
        double Fahrenheit;
        double DegreeCelsius = 28;
        Fahrenheit = (DegreeCelsius * 1.8) + 32;
        Sop( DegreeCelsius + "Degree Celsius is equal to " + Fahrenheit + " Fahrenheit");
        Sop ("Program ends...");
    }
}
```

O/p :-

```
Program starts...
28 Degree Celsius is equal to 82.4 Fahrenheit
Program ends...
```

******

15-01-2013 | TUESDAY | Condition Statements

P12

1) If - Else Statements

```
1. class Demo3
{
   public static void main(String[] args)
   {
     S.o.p("Program Starts...");
     final int empID=1029;
     If (empID == 1021);
      {
        S.o.p("This empID belongs to Project manager");
      }
     else{
        S.o.p("This empID doesn't belongs to Project manager");
     }
     S.o.p("Program ends...")
   }
```

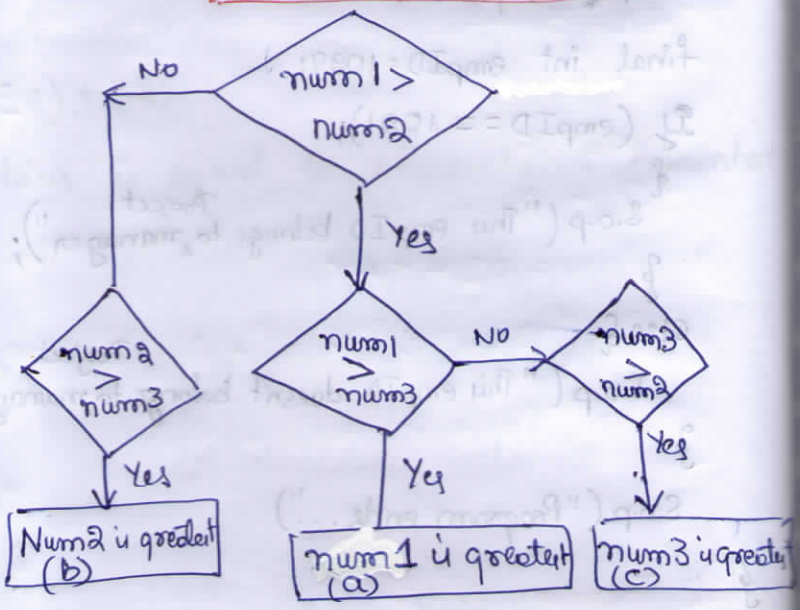
P13

```
2. Class Demo4
   psvm ( String[] args)
{  S.o.p ("Program Starts...");
   final int empID = 1026;
   if (empID == 1021)
   {
     S.o.p ("This empID belongs to Project Manager");
   } else if (empID==1022)
          {
            S.o.p ("This empID belongs to Team Lead");
   } else
   {
     S.o.p ("This empID doesn't belong to PM or TL");
   }
     S.o.p ("Program ends...");
}
```

Assign

1. Declare 3 variable integer type and display higher of the three.

		(And) &&	(or) ||
T	T	T	T
T	F	F	T
F	T	F	T
F	F	F	F



P14

3. class Demo4

```
{
  psvm(String[] args)
  {
   S.o.p("Program starts...");
   int a =223;
   int b = 34;
   int c =183;
   if ( a >b && a>c) // T&&T
   {
    S.o.p (a+" is highest");
   }
   else if ( b>a && b>c) // T&&T
   {
    S.o.p (b+" is highest");
   }
   else
   {
    S.o.p(c+"is highest");
   }
  }
   S.o.p ("Program ends...");
}
```

(or)

```
if( a >b)
{   if( a>c)
    {   (a is highest);
    } else if (c>b)
    {   (c is highest);
    }
else
{   (b is highest);
}
```

P15

Loops

for loop:- [execute intended number of times]

```
class Demo5
{
psvm (String[] args)
{
S.o.p ("Program starts...");
int empID = 10213;
// loops
for (int i=0; i<5 ; i++)
{
S.o.p ("value of empID i " +empID);
}
S.o.p ("Program ends...");
}
```

```
for (initiale ; condition ; inc/dec)
{
  //tasks
}
```

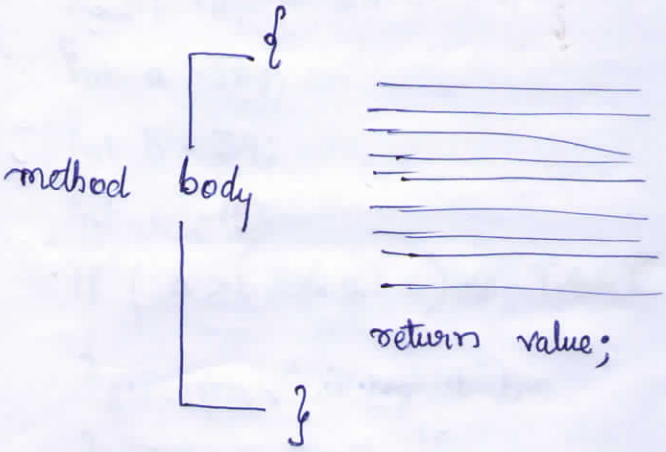
16-01-2013 WEDNESDAY

* Modification of Code line number 6

METHODS :

SYNTAX:

modifiers returntype methodName (arg0, arg1, arg2) ← data passed



// Mandatory Statement

Example:

P16

```
class Demo1
{
  psvm (String[] args)
  {
   S.o.p ("Program Starts...");
6. Sample ();          // invoking method (or) Calling method
   S.o.p ("Program ends...");
  }
}

Static int sample();
{
  S.o.p ("running Sample method");
  return 10;
}

}
```

O/P - Program Starts...
running Sample method
Program ends...

---

*

```
6. int ret = sample();
7 S.o.p ("value of ret is "+ret);
```

O/P = Program starts...
running Sample method
value of ret is 10
Program ends...

Example 2:

P17

```
class Demo2
{
    psvm (String[] args)
    {
     Sop ("Program starts...");
     sample();
     Sop ("Program ends...");
    }
    static void sample()
    {
      Sop. out. println ("running sample method");
      // compiler writes return statement here
    }
}
```

I.Q

Is return statement mandatory in a method in java?

Ans:- Yes, but incase of a void method [compiler writes return statement] No.

O/P: Program starts...
running sample method
Program ends...

Example 3:

P18

```
class Demo3
{
    psvm (String[] args)
    {
     Sop ("Program starts...");
     int res = sample (12, 34);
     S.o.p ("result is "+res);
     S.o.p ("*********");
     int res = sample (23, 64);
     Sop ("result is "+res);
     Sop ("Program ends...");
    }
```

PTO

```
Static int sample (int a, int b)
{
  Sop("running sample method");
  Sop ("value of a is" +a);
  Sop ("Value of b is"+b);
  int sum = a+b;
  return sum;
}
}
```

O/P:

```
Program starts...
running sample method
Value of a is 12;
Value of b is 34
value of res is 46
* * * * * * * * *
running sample method
Value of a is 23
Value of b is 64
Value of res is 87
Program ends...
```

NOTES

22*) While developing programs the repeatative tasks/operation are develop as method.

23*) method is a block when invoked executes all the statements of method body.

24*) The Syntax to develop a method in java is

```
modifiers returnType methodName (arg0, arg1, arg2)
{
  ____
  ____
  return value;
}
```

25*) In every method return statement is mandatory

26*) A return statement indicates the type of value the method has to returned.
return value should match return type.

27*) Args are variable used to store data passed for method.

28*) A void return type indicates that method returns nothing.

29*) If a method return type is declared as void it is not mandatory to write return statement, in such case compiler writes return statement at the time of compilation.

Assign

1. S.I , Degree to F , Area of Circle using method.

P19

```
class AssignCombine
{ psvm(String[] args)
  {
    sop("Program starts...");

    double res = SimpleInterest(10000, 0.15, 2);
    Sop("Simple Interest is "+res);
    Sop("* * * * * * * * * * * * * *");
    double res = degreeToFahrenheit(28);
    Sop("Fahrenheit is "+res);
    Sop("* * * * * * * * * * * * * *");

    double area = areaOfCircle(20);
    Sop("Area of Circle is "+area);
    Sop("* * * * * * * * * * * * * *");
    Sop("Program ends...");
  }
```

```
Static double simpleInterest (double a, double rate, int time)
{
 System.o.p("Running simpleInterest method");
 double interest = a*rate*time;
 Sop("The amount "+a+" at the rate of "+rate+" for "+time+" years,");
 return interest;
}
static double degreeToFahrenheit (double degreeCelsius)
 {
  Sop ("Running Degree Celsius to Fahrenheit");
  double res = (degreeCelsius *1.8) + 32;
  S.o.p (" degreeCelsius + " Degree Celsius is equal to ");
  return res;
  }
  static double areaOfCirde (double radius)
  {
    S.o.p ("Running area of Cirde method");
    final double PI= 3.14;
    double area = PI * radius * radius;
    S.o.p (" For radius "+radius);
    return area;
   }

}
```

17-01-2013 | THURSDAY

```
int i = 10;
```

```
i = i+1;
```
→ binary operator
operand

* Unary operator:

* on only one operand

++ → increment
-- → decrement
→ post [use current value first & then increment]
→ pre

Example 1:

P20

```
class Demo5
{
  psvm (String[] args)
  {
    System.o.p("Program starts...");
    int i = 1;
    Sop("i value bef inc "+i);
    ++i;                          // pre increment
    Sop("i value after inc "+i);
    S.o.p("Program ends");
  }
}
```

O/P:-
Program starts...
i value bef inc is 1
i value aft inc is 2
Program ends...

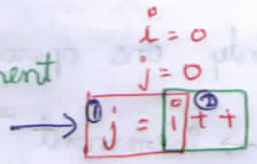
```
i++;                              // post increment
Sop("i value after inc "+i);
```

Example 2;

P21

```
class Demo6
{
    psvm (String[] args)
    {
        Sop ("Program starts...");
        int i=0;
        int j = 0;
        j = i++;
        Sop ("value of i "+i);
        Sop ("value of j "+j);
        Sop ("Program ends...");
    }
}
```

// post increment



1. j = 0
2. i ++ = 0+1 = 1
   ⇒ i = 1

O/P:

```
Program start...
value of i is 1
Value of j is 0
Program ends...
```

Example 3:

P22

```
class Demo7
{
    psvm (String[] args)
    {
        Sop ("Program starts...")
        int i=0;
        int j=0;
        j= i++ + 1;
        Sop("value of i is "+i);
        Sop ("value of j is "+j);
        Sop ("Program ends..."),
    }
}
```

//

j = i++ + 1
j = 0 + 1
j = 1

i = i++
= 0++
i = 1

O/P:

```
Program starts...
value of i is 1
Value of j is 1
Program ends...
```

Example 4:-

P23

```
class Demo8
{
psvm (String[] args)
 {
  Sop ("Program starts...");
  int i = 0;
  int j = 0;
   j = i++ + i;
   S.o.p ("Value of i " + i);
   Sop ("value of j " + j);
   Sop ("Program ends...");
 }
}
```

i = 0++ = 1

i = 1

j = 0++ + 1

j = 0 + 1

j = 1

O/P :- Program starts...
value of i is 1
value of j is 1
Program ends...

Example 5 :- P24

```
   j = i++ + i++ + i
```

j = 0 + 1 + 2

j = 3

O/P :- Program starts...
value of i = 2
value of j = 3
Program ends...

Example 6 :-

P25

```
class Demo9
{
  psvm (String[] args)
  {
  Sop ("Program starts...");
  int i = 0;
  int j = 0;
  j = ++i;                    // 1. ++i = 1  2. => j = 1
  Sop ("Value of i is "+i);
  Sop ("Value of j is "+j);
  Sop ("Program ends...");
  }
}
```

O/p :- Program starts...
Value of i is 1
Value of j is 1
Program ends...

Example 7 :- P26

8* j = i + ++i + i++ + ++i;

// = 0 + 1 + 1 + 3

(1+2)

j = 0 + 1 + 1 + 3 i = 3

O/p :- Program starts...
value of i is 3
value of j is 5
Program ends...

Example 8 :

P27

```
class Demo10
{
  psvm (String[] args)
  {
    Sop ("Program starts...");
    int i=12;
    test1 (i++);
    Sop ("i = "+i);
    Sop("Program ends...");
  }
  static void test1 (int a)
  {
    Sop ("a="+a);
  }
}
```

// 1. test1 (12) i

2. i = 12++
   i = 13

O/P :-
Program starts...
a = 12
i = 13
Program ends...

Example 9 : P28

```
test1 (++i);
```

O/P :-
Program starts...
a=13
i=13
Program ends...

Example 10 : P29

```
class Demo11
{
  public svm (String[] args)
  {
    Sop ("Program starts...");
    int i=1;
    int j = test1(i)
    Sop ("i= "+i);
    Sop ("j= "+j);
```

```
    Sop("Program ends...");
  }
  static int test1(int a)
  {
    System.out.println("a = "+a);
15*  return a++;          // returns current value of a i.e 1
  }                       // and then increments a but it cannot
}                         // be accessed as control goes to main
                          // method from test1 method
```

O/P :- Program starts...
a = 1
i = 1
j = 1
Program ends...

```
15*  return ++a;          // return value after increment a i.e 2
```

O/P :- Program starts...
a = 1
i = 1
j = 2
Program ends...

Example 11: P30

```
class Demo12
{ psvm(String[] args)
  {
    Sop("Program starts...");
    int i = 0;
    int j = i++ + ++i + test1(i++) + i;
        // 0  +  2  +  3      + 3
    Sop("i = "+i);
    Sop("j = "+j);
    Sop("Program ends...");
  }
```

```
Static int test1 (int a)
{
  Sop ("a = "+a) //2
  return ++a;
}
}
```

NOTES

30*) Unary operator works on single operand. Java supports two types unary operators

30.1*) Increment ++

30.2*) Decrement --

31*) These operators are again classified as

31.1) pre

31.2) post

32*) Post increment - means use current value for operation & increment variable value by 1.

33*) Pre increment - means increment current value & use final value after increment.

34*) Same for post decrement & pre decrement only diff value gets reduced by 1.

GLOBAL VARIABLE

P31

Example 1

```
class Demo13
{
  static int i ; // global variable & also for long, short, byte
  static double d;                    //also for float f
  static char c;
  static boolean b;
  psvm (String[] args)
  {
   Sop("Program starts...");
   Sop ("i ="+i);
   Sop ("d="+d);
   Sop ("c="+c);
   Sop ("b="+b);
   Sop ("Program ends...");
  }
}
```

O/p :- Program starts...

i=0

d=0.0

c=

b=false

Program ends...

Example 2:

P32

```
class Demo13
{
    static int i=12;
    psvm (String[] args)
    {
     Sop("Program starts ...");
     Sop(" i ="+i);    // referring global
     i=24;             // global
     Sop("i="+i);      // global
     int i=78;         // local variable declaration
     Sop("i="+i);      // local
     i=45;             // local
     Sop("i="+i);      // local
     Sop("i="+Demo13.i); // global
     Sop("Program ends...")
    }
}
```

O/P :

```
Program starts...
i =12
i =24
i =78
i =45
i =24
Program ends...
```

21-01-2013 / MONDAY

CLASS MEMBERS [Methods & Variables]

Static (single copy)

non static (multiple instance)

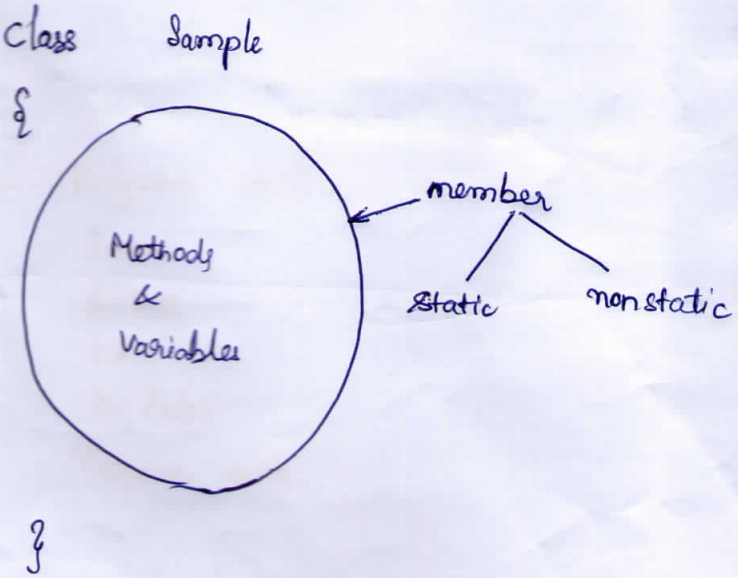
Members of Class:

1*) The members of class are catagerized as static members and non static members.

2*) Static members are declared with static keyword where as non static members are declared without any keyword.

3*) Static members of class can be accessed by using Classname.

4*) Non static members are accessed by using Referencevariable.



Example 1:

P33

```
class MemberA
{
  static int i;
  static double di
  psvm (String[] args)
  {
    Sop ("Program starts...");
    MemberA.display(); // Accessing static member of MemberA
    Sop ("----------");
MemberA.i = 10;
MemberA.d = 23.45;
    MemberA.display();
    Sop ("Program ends...");
  }
  static void display()
  {
    Sop ("i=" + MemberA.i);
    Sop ("d=" + MemberA.d);
  }
}
```

O/P: Program starts...

i=0

i=0.0

---

i=10

i=23.45

Program ends...

Variables

Primitive :

Stores only primitive value

Reference Variable

Reference Variable :

* A reference variables are created using Classname.

Syntax given below

```
Classname refvariable = new Classname();
```

```
refvariable.MemberName
```

① Create reference Variable

```
ClassName Ref VariableName;
```

declaration

```
Variablename = new classname();
```

Initialization

P34

```
Class ClassB
{
  int k;
  double s;
  psvm (String[] args)
  {
   Sop ("Program starts...");
   ClassB b1 = new ClassB();
   Sop ("k="+ b1.k);
   Sop ("s="+ b1.s);
   b1.test1();
   Sop ("Program ends...");
  }
  void test1()
  {
   Sop ("running test1()...");
  }
}
```

O/p:

```
Program starts...
k=0
s=0.0
running test1()...
Program ends...
```

P35

```
class ClassC
{
    static int a;
    double b;
    psvm (String[] args)
    {
     Sop ("Program start...");

Line#
9.  ClassC c1 = new ClassC();
10. Sop ("b = "+ c1.b);
11. Sop ("a = " + ClassC.a);
12. ClassC.sample1();
13. c1.sample2();
    Sop ("Program ends...");
    }
    static void sample1()
    {
      Sop ("running sample1()...");
    }
    void sample2()
    {
      Sop ("running sample2()...");
    }
}
```

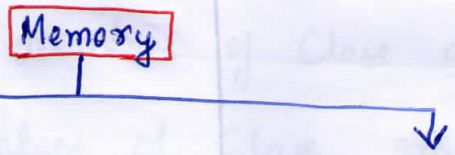
//Line# 10, 11 accessing static members

//Line# 9, 12 accessing non static members of ClassC

O/p :-

22-01-2013 | Tuesday

java = jvm



Read/write memory

* write/read multiple times.

Example: RAM, USB, HDD etc

Read only memory

* write once.
* read many times.

Example: cd ROM
DVD ROM
⋮

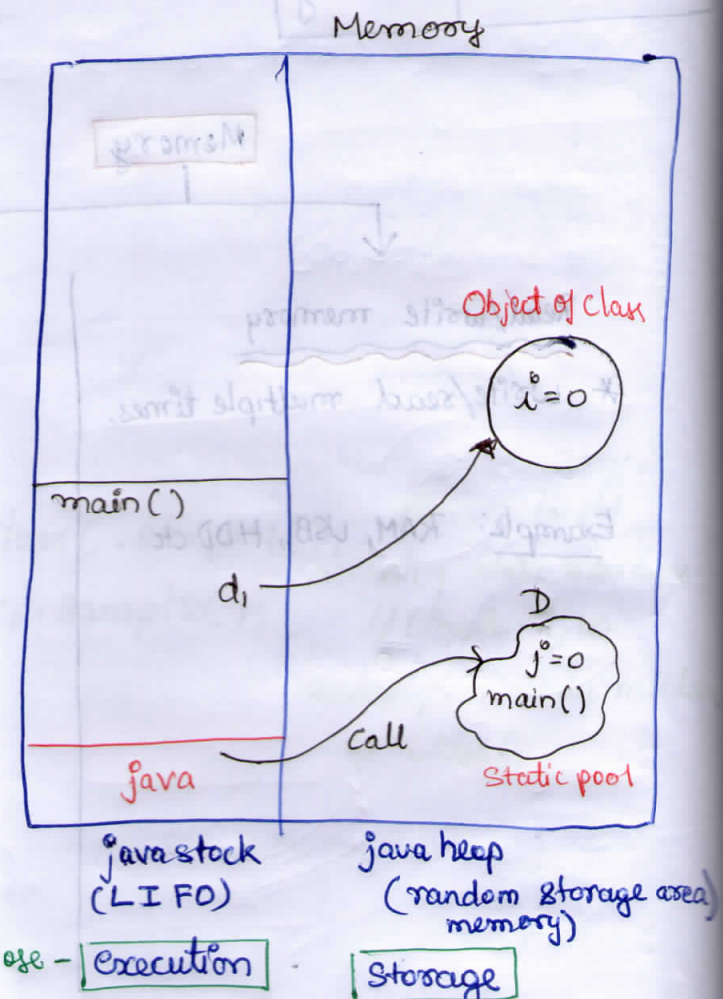
Read/write memory

RAM	HDD
1. volatile.	1. non volatile.
* Made of IC's	* Made of Magnetic type

Example 1 : P36

MEMORY MANAGEMENT IN JAVA

```
class D
{
    int i;
    static int j;
    psvm (String[] args)
    {
     Sop ("Program starts...");
     Sop ("j="+D.j);
     D d1 = new D();
     Sop ("i="+d1.i);
     Sop ("Program ends...");
    }
}
```



Memory Management in Java

1*) Whenever a java class is executed the memory get allocated. This memory is divided into 2 area
   1. java stack
   2. java heap

2*) Javastack is a Last In First Out implementation and this stack is used for execution purpose.

3*) Java heap are random storage area, is used for storing members of Class.

4*) After memory allocation java enters into stack and calls ClassLoader.

5) ClassLoader is a java Class which loads the members of the Class which is needs to be executed.

6) While static members of Class are loaded into heap.

7) All static members of Class resides in the common area known as static pool.

8) After ClassLoading step, java calls main() method for execution. main() enters into stack on top of java and Executes all the statements of main() line by line.

9) Whenever jvm encounters Object creation Statement, the Objects are created in the heap. An Object is an instance of Class, this object is referred by reference variable

10) Whenever an Object is created, the non static members of the class are loaded into Object memory.

11) The members available in static pool, should be accessed through Classname. This is also known as Class reference.

12) The members loaded in the Object [non static] can be accessed by using Reference Variable, this is also known as Object reference.

13) Once the main() completes all the statement, the main() gets out of the stack and control returns back to java [jvm].

14) The java calls Garbage Collector, which cleans the

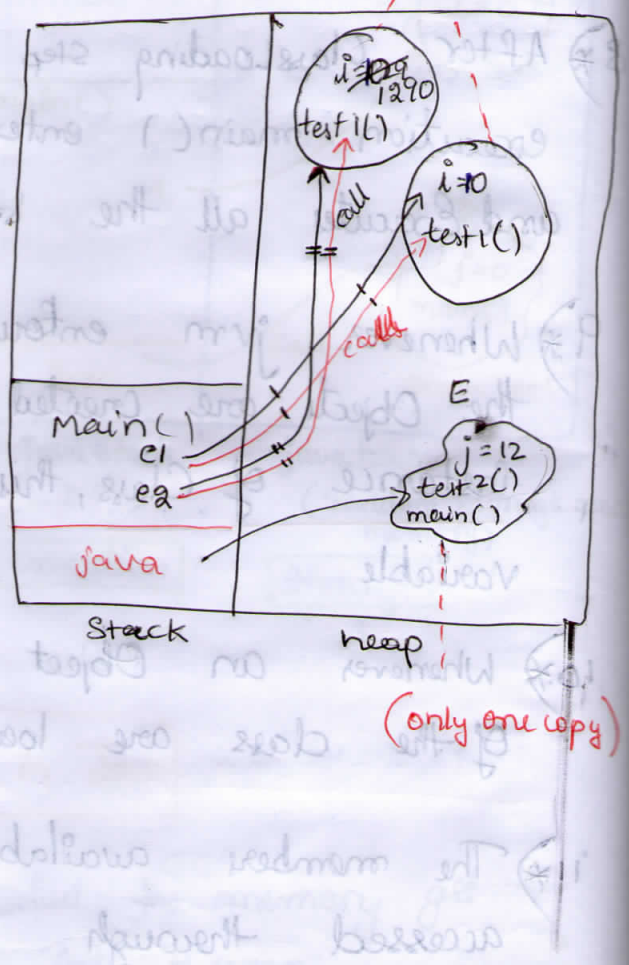
heap memory. After this java get out of stack and releases the memory back to Main Memory [RAM].

Example 2 P37

(multiple instances of class)

[Object/instance of Class]

```
class E
{
    int i=10;
    static int j = 12;
    void test1()
    {
        Sop ("running test1()...");
    }
    static void test2()
    {
        Sop ("running test2()...");
    }
    psvm(String[] args)
    {
        Sop ("Program starts...");
        // accessing static members
        Sop ("j = "+E.j);
        E.test2();
        Sop ("* ** *** **** *");
        // non static members
        E e1 = new E();
        Sop ("i = "+e1.i);
        e1.test1();
        Sop("* ** *** **** *");
        E e2 = new E();
        Sop ("i=
```



(only one copy)

```
        e2.i = 1290;
        Sop ("i = "+e2.i);
        e2.test1();
        Sop ("Program ends...");
    }
}
```

O/P:

```
Program starts...
j=12
running test2()...
* * * * * * * * *
i=10;
running test1()...
* * * * * * * * *
i=1290
running test2()...
program ends.
```

Example 3: P38

```
class F
{
  int i=120; // Global variable, non static member
  void test1()
  {
    Sop("running test1()...");
    int i = 187; // local variable
    Sop("i = "+i);
  }
psvm(String[] args)
{
  Sop("Program starts...");
  F f1 = new F();
  Sop("i = "+f1.i);
  f1.test1();
  Sop("Program ends...");
  }
}
```

→ Here 'i' is local variable, which gets load into stack memory when

O/P:

```
Program starts...
i=120
running test1()...
i=187
Program ends...
```

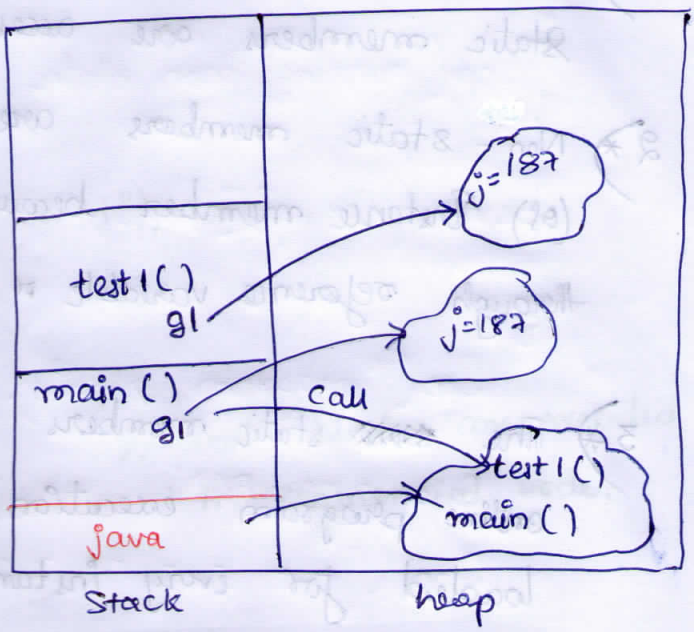
Abundant Object

Example 4: P39

```
class G
{
    int j = 187;
    static void test1()
    {
        Sop("running test1() method...");
        G g1 = new G();  // local
        Sop("j = "+g1.j);
    }

    psvm (String[] args)
    {
        Sop ("Program starts...");
        G.test1();
        Sop ("Program ends...");
    }
}
```

```
[ G g1 = new G();
  Sop("j = " + g1.j); ]
```



* Any object which doesn't have a reference variable is called ~~abandant~~ abuntant object.

Summary:

1 *) Static members are also known as Class member because Static members are accessed through class.

2 *) Non - static members are also known as Object members (or) Instance member because these member are accessed through reference variable or Objects.

3 *) The static members will be loaded only once for entire program execution, whereas non-static members are loaded for every instance of the Class.

4 *) If a member of an instance is changed that changes will not reflect in the other instance.

5 *) The static members can be shared across the Objects.

6 *) During execution a method enters into stack to execute all the statements of method. The local variables will be residing inside stack memory.

7 *) The life of local variable, is as long as the method stays in stack.

8 *) All objects will be created in heap, the reference to the object can be in the heap or in the stack.

9 *) If any Object exist without reference variable then such objects are known abundant Variable

Blocks:

Jspiders\Selenium\corejava\ blocks ← create new folder.

Example P40

```
Class A
{
    static
    {
        Sop("running static block-1");
    }

    psvm(String[] args)
    {
        Sop("Program starts...");
        Sop("Program ends...");
    }
    static
    {
        Sop("running static block-2");
    }
}
```

// static blocks are executed in sequencial order

O/P:

```
running static block-1
running static block-2
Program starts
Program ends
```

* When

P41

```
class B
{
    {
     Sop("running non static block-1");
    }

    psvm ( String[] args)
    {
      Sop("program starts...");
      B b1 = new B();          // non static blocks are executed during object creation
      Sop ("- - - - - - - - -");
      B b2 = new B();
      Sop ("program ends...");
    }

    {
      Sop ("running non static block-2");
    }
}
```

O/P:

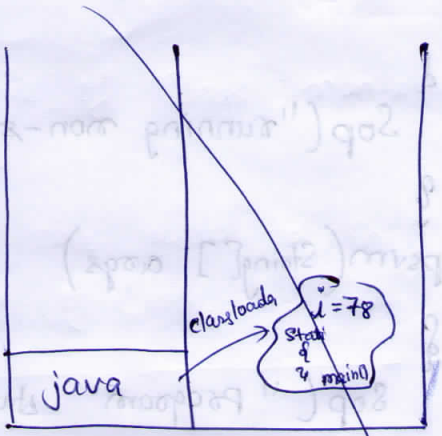
```
Program starts...
running non static block-1
running non static block-2
- - - - - - - - - - -
running non static block-1
running non static block-2
Program ends...
```

```
class C
{
  {
    Sop("running non-static block");
  }
  psvm(String[] args)
  {
    Sop("program starts...");
    C c1 = new C();
    Sop("program ends...");
  }
  static
  {
    Sop("running static block");
  }
  static
  {
    Sop("running static block");
  }
}
```

O/P:

```
running static block
running static block
Program starts...
running non-static block
Program ends...
```

```
class D
{
  static int i=78;
  static
  {
    i=29;
  }
  psvm (String[] args)
  {
    Sop ("program starts...");
    Sop ("i = "+D.i);
    Sop ("program ends...");
  }
}
```



P43

```
class D
{
  static int i=78;
  int j = 557;
  static
  {
    i = 29;
  }
  {
    j= 4354
  }
  psvm ( )
  {
    Sop ("Program starts...");
    Sop ("i = "+D.i);
    Sop ("_ _ _ _ _ _ _ _");
```

```
        D d1 = new D();
        Sop ("j= " + d1.j);
        Sop ("Program ends...");
    }
}
```

O/P:

```
Program starts...
i=29
- - - - - - - -
j= 4354
Program ends...
```

Summary :-

1*) blocks are classified into 2 types;

1.1) static block

1.2) Non-static block

2*) static block: 2.1*) gets executed before running the main() in a sequential order.

2.2*) We can develop multiple static block, all static blocks will be executed in a sequential order.

2.3*) Static block are used to initialize the static variable of Class.

3*) Non-static block: 3.1*) gets executed at the time of Object creation.

3.2*) We can develop multiple non-static blocks in Class

3.3*) All non static blocks gets executed in a seq order.

3.4*) For every instance of Class non-static block gets executed.

3.5*) Non static blocks are used to initialize non static variables of Class.

---

* * * * * * * *

P44

```
class E
{
    int i;
    double d;
    void print()
    {
      Sop("i=" + i);
      Sop ("d=" + d);
    }
    psvm(String[] args)
    {
      Sop("program starts...");
      E e1 = new E();
      e1.print();
      Sop("program ends...");
    }
    {
      i = 218;
      d = 876.23;
    }
}
```

O/p :

```
Program starts...
i = 218
d = 876.23
Program ends...
```