By Nancy

CHAPTER-1 :BASICS OF JAVA

Objective

- Java - What, Where and Why?
- History and Features of Java
- Internals of Java Program
- Difference between JDK, JRE and JVM
- Internal Details of JVM
- Variable and Data Type
- Naming Convention
- Access Modifiers
- Static keyword - variables

History

- Java is a High Level Programming Language.
- Developed by Sun Microsystems in 1991.
- Original name of java is OAK.
- OAK was designed for handheld devices and set top boxes.
- Sun changed the name to JAVA.
- In 2009 , Oracle acquire Sun Microsystems.
- Now the owner of java is ORACLE.
- Java is object oriented programming language.

Features of Java

The Java Features given below are simple and easy to understand…

- Simple
- Object-Oriented
- Platform independent
- Secured
- Portable
- High Performance
- Multithreaded

More information

- There are more than 9 million java developers worldwide.
- 3 billion mobile phones run JAVA.

Basic terminology

- **SOURCE CODE :** files with ‘.java’ extension.
- **BYTE CODE :** files with ‘.class’ extension.
- **COMPILER:** which convert source code into byte code.
- **INTERPRETER:** who executes the compiled java code directly .line by line. slow.
- **JIT COMPILER :** Just-In-Time compiler covert the byte code into machine code.JIT don’t do code compilation but the byte code compilation to a processor language.

Continue...

- JVM : This is a abstract computing machine. Java virtual machine is a ‘Machine in a machine’.
- It uses both Interpreter and JIT compiler.
- JVM exist for almost all OS like windows, UNIX , Macintosh OS. This makes the language ‘JAVA’ platform independent.
- JVM translates the programming language compiled source code(i.e. byte code) directly into machine code that is designed to run on specific OS such as windows and UNIX.SO it is a platform independent execution environment.

JDK,JRE and JVM

- **JRE** : **Java Runtime Environment**.
  - It is used to provide runtime environment.
  - It is the implementation of **JVM**.
  - It physically exists.
  - It contains set of libraries + other files that **JVM** uses at runtime.
- **JDK** : **Java Development Kit**.
  - It physically exists.
  - It contains **JRE** + development tools.
- **JVM : Java Virtual Machine**
  - It is an abstract machine.
  - It is a specification that provides runtime environment in which java byte code can be executed.

JRE

- JRE does not contain any development tools such as compiler, debugger, etc.
- Actually JVM runs the program, and it uses the class libraries, and other supporting files provided in JRE.
- If you want to run any java program, you need to have JRE installed in the system

JDK

- The JDK is a superset of the JRE, and contains everything that is in the JRE, plus tools such as the compilers and debuggers necessary for developing applets and applications.
- You need JDK, if at all you want to write your own programs, and to compile them. For just running java programs, JRE is sufficient.

JVM

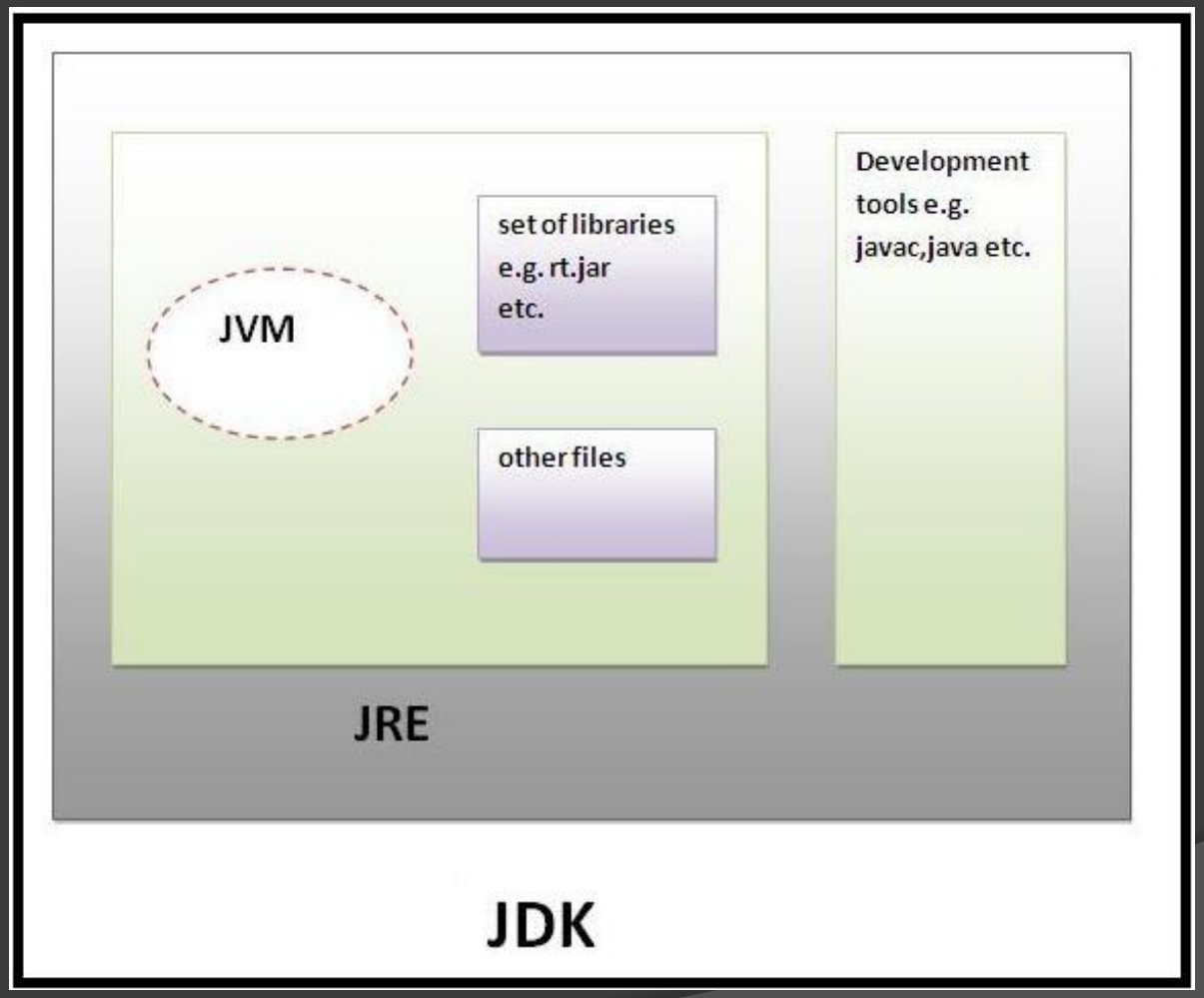
- we all know when we compile a Java file, output is not an ‘exe’ but it’s a ‘.class’ file.
- ‘.class’ file consists of Java byte codes which are understandable by JVM.
- Java Virtual Machine interprets the byte code into the machine code depending upon the underlying operating system and hardware combination.
- It is responsible for all the things like garbage collection, array bounds checking, etc
- Java Virtual Machine provides a platform-independent way of executing code.
- It executes the .class file which you get after you compile the Java program regardless of whether you compile it on Windows, Mac or Linux.

Extra Information

Java Runtime Environment vs. Java Development Kit

- JRE = JVM + Java class libraries.
- JDK = Java compiler + JVM + Java class libraries.

Have a look...


JVM
set of libraries
e.g. rt.jar
etc.
other files
Development
tools e.g.
javac,java etc.
JRE
JDK

Get set go!

HelloJava.java - Notepad

File Edit Format View Help

```
public class HelloJava {

        public static void main(String[] args){
                System.out.println("\nHi Naren! I am your first JAVA program.");
        }
}
```

Name	Date modified	Type	Size
HelloJava.class	16-09-2015 12:41	CLASS File	1 KB
HelloJava.java	16-09-2015 12:16	JAVA File	1 KB

C:\windows\system32\cmd.exe

```
G:\demo>javac HelloJava.java

G:\demo>java HelloJava

Hi Naren! I am your first JAVA program.

G:\demo>_
```

You must know!

- Public : Public means that this method will be accessible to any class.
- Static : It can be accessed without creating the instance of Class.
- Void : Return Type, Which is void , it means that this method will not return any thing.
- Main : This method name is searched by JVM as starting point for an application.
- Arguments : Parameter to main method.

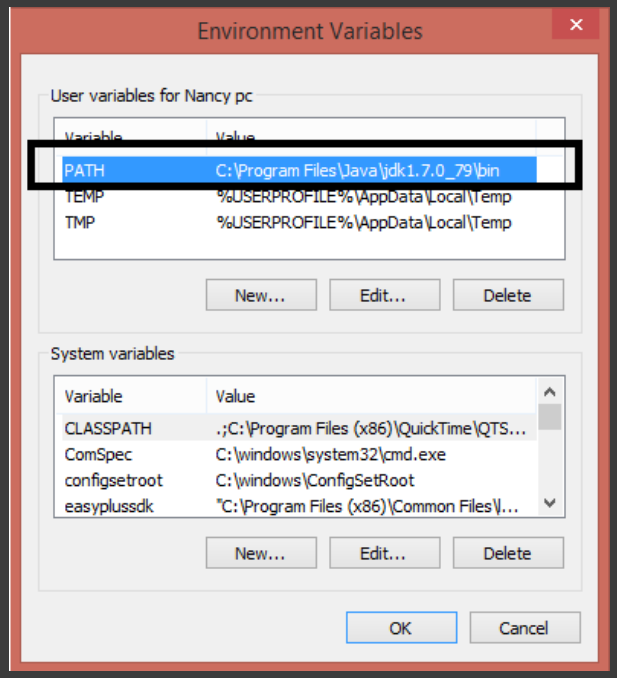
Lets starts Now...

- In my first few classes you are going to learn about
  - Java language structure,
  - Object Oriented programming language
  - Declarations and Access control .
- Lets start with basics structure of Java...

- To learn Java …. You can contact @8800405544

Troubleshooting

- Install java from http://www.oracle.com/technetwork/java/javase/downloads/jdk7-downloads-1880260.html
- Check PATH variable for jdk 1.7.0 path.



Thanks

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