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# OOP with JAVA

Short Questions

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## Chapter No 01

# Introduction to Java

## Short Questions

**Q1: What is OPP(Object oriented programming)?**

OPP (object oriented programming) is a programming style that is associated with the concept of classes, objects and various other concepts revolving around these two.

**Q2: When was Java introduced?**

The JAVA was developed by **Sun Microsystems** in 1991 and named as OAK. It was named as **JAVA** in 1995. The first stable version, JDK 1.0.2, is called Java 1. The latest version of java at this time is **JAVA SE 8**.

**Q3: Who made Java?**

Java was developed by **Sun Microsystems** in 1991. Java was created by **James Gosling** who was a best Canadian computer scientist. According to the Sun Microsystems, three billion devices are using Java.

**Q4: What do you know about the security of Java?**

Java is a powerful general-purpose programming language environment. It is one of the most used programming language in the world. Java is robust, secured and object oriented programming language. It is guaranteed to write once run anywhere (WORA).

### Q5: What is JVM(Java Virtual Machine)?

The JVM (java virtual machine) is a program that provides the runtime environment necessary for Java programs to execute. JVM is a machine within a machine. Java programs cannot run unless there is a JVM available for the appropriate operating system platform we wish to execute.

**Syntax:**      java<arguments><program name>

### Q6: What are program execution phases?

There are three phases for a program execution:

1. Writing a Program. (A programmer writes a code to make a program)
2. Compilation of Program. {This is done by **javac** (java compiler) }
3. Running the Program.

### Q7: What is Byte Code?

A halfway house between source code and object code is called byte code. Byte code is a format that can be executed efficiently by the **JVM's** interpreter.

### Q8: What is JRE (Java Runtime Environment)?

JRE is used to provide a java runtime environment at runtime. It contains a set of libraries (.h) in combination with core classes and various other files that are used by **JVM** at runtime. JRE is a part of **JDK (Java Development Kit)**.

### Q9: State components of JRE?

- Java webstart and plugin.
- User interface kit (AWT, Swing, Image input/output).
- JRE includes JDBC (Java Database Connectivity).
- IDL (Interface Development Language) and JNDI (Java Naming Development Interface) and RMI (Remote Method Invocation).

### Q10: What is JDK (Java Development Kit)?

JDK contains everything that is required to compile and run a java program. JDK is a software kit in java, when you download JDK, JRE is also downloaded. In addition to JRE, JDK contains a number of development tools (compilers, debuggers, Javadoc etc).

### Q11: What is IDE (Integrated Development Environment)?

An IDE (integrated development environment) is a software suit that consolidates the basic tools developers need to write and test software.


**Q12: How to create a new project in Netbeans (IDE)?**

1. File -> New project.
2. Then select "Java" under category
3. Select "java application" under project and click next.
4. Enter a project name.
5. Select project location and check "create main class" then click finish.

**Q13: How to add Class or Package in java program?**

1. File -> Newfile.
2. Select "java" under category.
3. Select "java class" under file type and click next.
4. Type name for class or package.
5. In case for class,select the desired package also and click finish.

**Q14: How to build a project in java?**

1. In netbeans IDE,after writing code click the "hammer" icon to build the project.
2. Click the green arrow  or press F6 to run the project.
3. Output should be at the bottom of screen.

**Q15: What is the structure of a java program?**

The structure of java program contains:

1. Package
2. .Class
3. Classname
4. Data members
5. Methods
6. Comments

**Q16: What is package?**

A package is a collection of classes,interfaces and sub-programs.

e.g `Java.lang.*;`

This package is imported by default.

**Q17: What is .class?**

**.Class** is a keyword used for developing user defined data type and every java program must start with the concept of class.

**Q18: Define classname?**

Classname represent a valid java variable name treated as the name of class.Each and every classname in java is a user defined data type.

**Q19: What are data members?**

Data members are variables declared inside a class.Data members maybe private or public.

**Q20: Define methods?**

The function declared inside a class are called member functions.These are also called methods and user defined functions.

**Q21: What are comments?**

Comments are the statements that are not executed by compiler or interpreter.Comments are used to provide information or explanation about the variable,method,class or any other statements.It can be used to hide the program code temporarily.

**Q22: Define single line comment?**

These are used to comment only single line a time.

**For Example:** //sum is use to add;

**Q23: Define multiline comment?**

These are used to comment multilines at a time.

**For Example:** //subtract is use to minus

//this a calculator code

## Q24: Define documentation?

These type of comments are used to provide information about the code to the programmer.

**For Example:**

```
/**  
    Coded by M Bilal  
    Start date 12/08/17  
    End date 25/08/17  
*/
```

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# LONG QUESTIONS

## Explain Java Program Structure

Every Java program consists of a collection of *classes*--nothing else. A class is a template for creating a particular form of *object*. Each *object* created by the template contains the same *members*, each of which is either a *field* or a *method*. A *field* is a "container" that holds a value. A *method* is an operation on the fields of the object and any values that are passed as arguments to the method. The objects created by a particular class template are called the *instances* or *objects* of that class. Each instance contains the members specified in the class template.

Structure of java program:

package details	→	import java.io.*
class className	→	class Sum
{		
Data members;	→	int a, b, c;
user_defined method;	→	void display();
public static void main(String args[])		
{		
Block of Statements;	→	System.out.println("Hello Java !");
}		
}		

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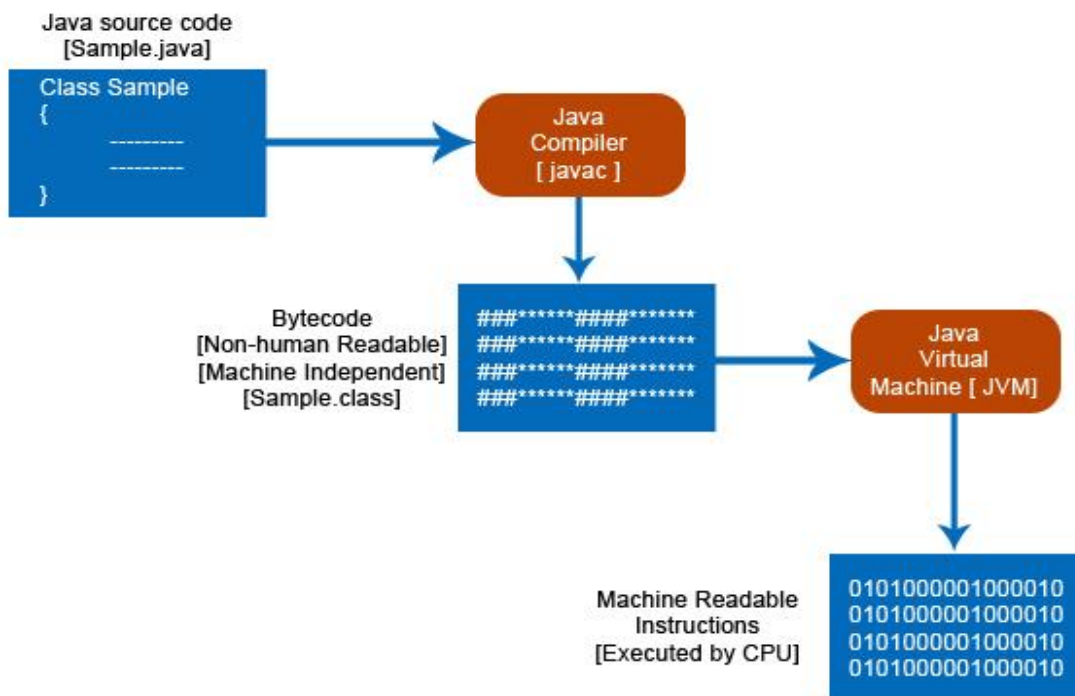
Java program involves following sections

- Documentation Section

- Package Statement
- Import Statements
- Interface Statement
- Class Definition
- Main Method Class
- Main method definition

## Explain life cycle of java program

Life cycle of a Java program.



There are three main stages in the life cycle of a java program. They are:

- Editing the program



- Compiling the source code
- Executing the byte code

In the first step we will edit the program and save it with *.java* extension

Second step is compilation. The name of the Java compiler is *javac*. The input to the compiler is Java source code. The output of the compiler is **machine independent or platform independent** code, which is known as *bytecode*. The file, which is generated after compilation, is *.class* file.

Last step is execution. Java Virtual Machine (JVM) will execute the bytecode generated by the compiler. Input to the JVM is bytecode and output is machine code (0's and 1's) which will be executed by the CPU of the local machine.

## Setup environment variable

**Step 1:** Right Click on My Computer and click on properties.

**Step 2:** Click on Advanced tab

**Step 3:** Click on Environment Variables

**Step 4:** Create a new class path for JAVA\_HOME

**Step 5:** Enter the Variable name as JAVA\_HOME and the value to your jdk bin path ie ;c:\Programfiles\Java\jdk-1.6\bin and

**Step 6:** Follow the Above step and edit the Path in System Variables add the following; ;c:\Programfiles\Java\jdk-1.6\bin:\Programfiles\Java\jdk-1.6\bin in the value column.

**Step 7:** You are done setting up your environment variables for your Java

## Instal NetBeans

## STEP 1: INSTALL JDK

To use NetBeans for Java programming, you need to first install Java Development Kit (JDK).

## STEP 2: DOWNLOAD

Download "NetBeans IDE" from <http://netbeans.org/downloads/index.html>. There are many "bundles" available. For beginners, choose the 1st entry "Java SE" (e.g., "netbeans-8.2-javase-windows.exe" 95MB).

## STEP 3: RUN THE INSTALLER

Run the downloaded installer.

## Integrated Development Environment

An integrated development environment (IDE) is a software application that provides comprehensive facilities to computer programmers for software development. An IDE normally consists of a source code editor, build automation tools, and a debugger. The mostly used IDE for coding in java are Eclipse and NetBeans.

## Java Virtual Machine

JVM is an abstract machine. It is a specification that provides runtime environment in which java byte code can be executed.

JVM are available for many hardware and software platform.

JVM perform following operations

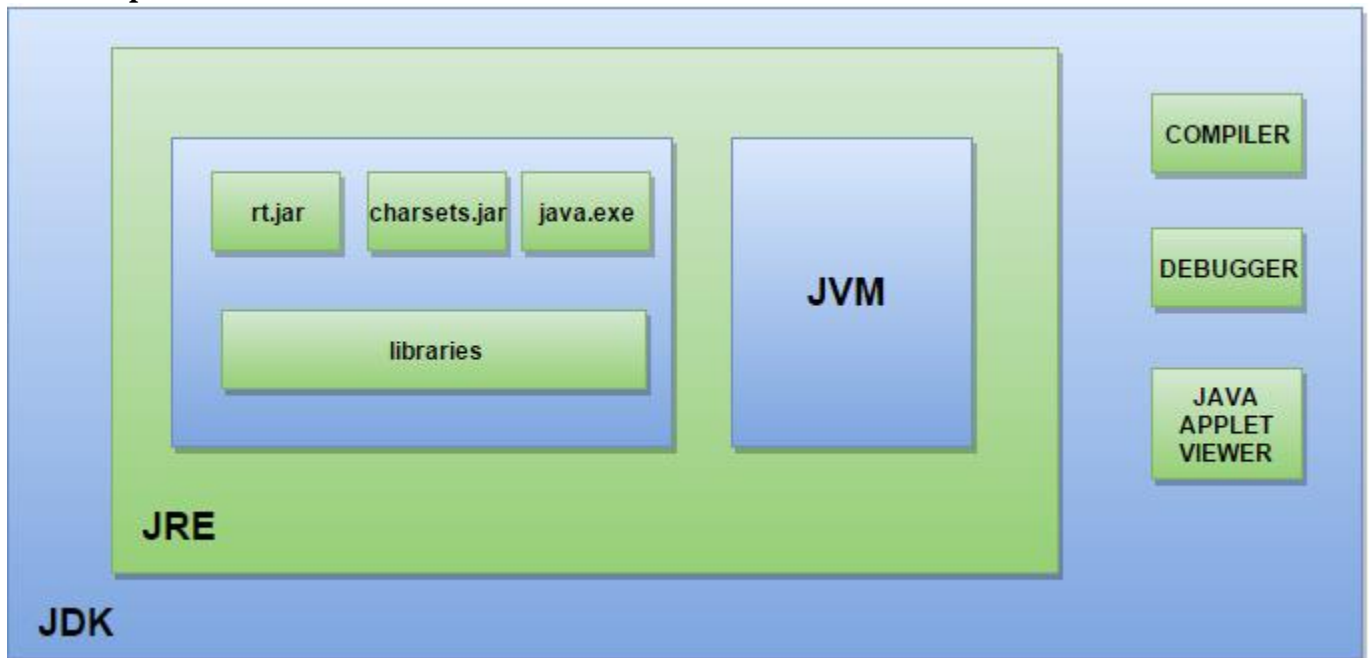
- Load code
- Verifies code
- Execute code

## Java Runtime Environment

Java runtime environment (JRE) is a set of software tools for development of java application. It combines the java virtual machine platform, core classes and supporting libraries. JRE is a part of the java development kit but can be download separately.

## Java Development Kit

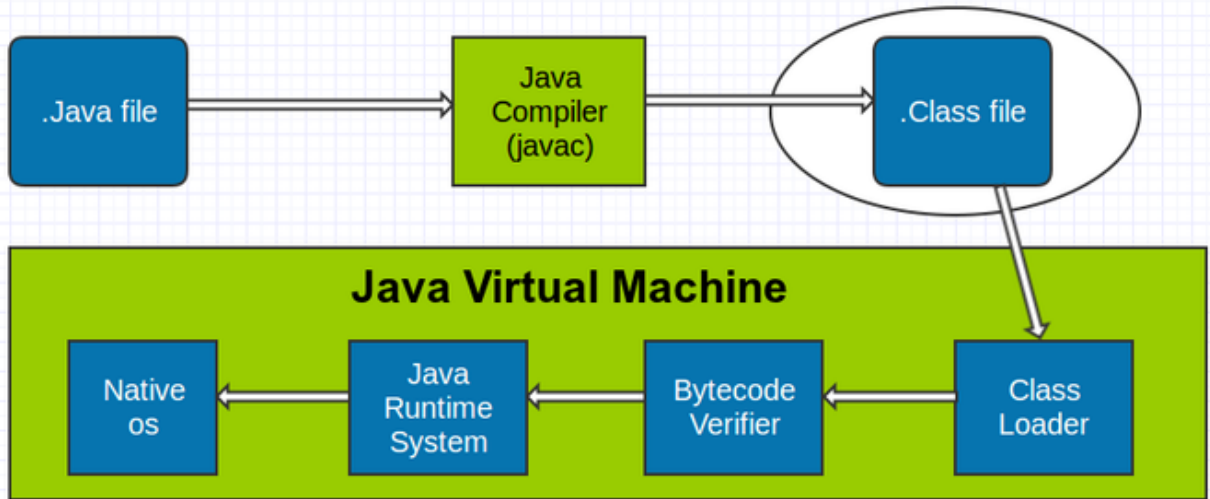
JDK is a software development environment used for developing java applications and applets. It includes the java runtime environment, an interpreter/loader, compiler, an archiver, a documentation generator (Javadoc) and other tools needed in java development.



## Byte Code

Byte code is computer object code that is processed by a program usually referred to as virtual machine rather than by the real computer hardware processor. The best-known language that use the byte code and virtual machine approach is java.

## Bytecode in Java



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