Assignment 1 (Java Basic):

1. What is programming language? What is Java and what is Java used for?
   1. Programming language instructs a computer or computing device to perform specific tasks.
   2. Java is a programming language that is object oriented, Java produces software for multiple platforms.
   3. Java is structured in such way that developers can write code anywhere and run it anywhere without worrying about the underlying computer architecture. It is also referred to as “write once, run anywhere” (WORA).
2. Which version of Java are you working with? How can you find out the version of Java you are working with?
   1. Version of Java I have installed in my machine is java version "1.8.0\_301"
   2. To know the version your machine has installed, open the command line app and type “java -version”.
3. What is IDE? Which IDE are you working with?
   1. IDE – stands for Integrated Development Environment.
   2. I have IntelliJ IDE Installed in my computer and that’s what I am using as well.
4. What is source code? What is file extension for Java source code?
   1. Source code is a list of commands that is written by programmer and later it is compiled and executed by machine.
   2. Source code file extension is (.Java)
5. What is the second stage of Java life cycle?
   1. Compiling the source code using Java compiler.
   2. After compiling the source code, the extension is (.class) file.
6. Which compiler is used for compiling java file?
   1. Java programming language compiler (javac) is used for compiling java file.
7. What files are the input and output of the compilation stage?
   1. The input of a Java compiler is Java source code file and the output is a Java class file.
8. Which command is used to call Java compiler in terminal or CMD?
   1. “javac” is used to compiler in terminal or CMD, javac followed by the program file name and .java an example is (javac myapp.java)
9. What is the third stage of Java life cycle?
   1. Third stage is the final stage where the compiled file gets executed into machine readable language.
10. At which stage class loader is used and what function does it perform?
    1. At run time class loader is used. Class loader loads the classes in to JVM and is used according to need.
11. Which unit is responsible for translating bytecodes into machine code?
    1. JVM- Java Virtual Machine is responsible for converting byte codes into machine specific code.
12. What is last stage of Java life cycle?
    1. Execution of the code is the last stage of Java life cycle. Byte code generated by the compiler will be executed by Java Virtual Machine (JVM).
13. Which command is used to run java program in terminal or CMD?
    1. Once your code is compiled using “javac (name of your application.java)” then all you need to do is, run the command “java (name of your application)” enter and your program should run as long path variable is set.
14. At what stage bytecode verifier is used?
    1. The bytecode verifier is used at the beginning of phase one.
15. What is JDK, briefly explain the components of JDK?
    1. JDK, is the Java Development Kit, it is a software development environment used for developing Java applications and applets.
    2. The JDK, includes the Java Runtime Environment (JRE), an interpreter/loader (JAVA), a compiler (JAVAC), an archiver (jar), a documentation generator (java doc) and other tools needed in java development.
16. Name main components present in JVM and write functions of each component.
    1. Class loader, Runtime memory/Data Area, Execution engine.
       1. Class loader- responsible for loading Java classes dynamically to the JVM during run time.
       2. Runtime memory- returns the maximum memory that the JVM will attempt to use. Once the JVM memory usage reaches this value, then it will not allocate more memory and instead it will garbage collect more frequently.
       3. Execution engine – is the central component of the Java Virtual Machine (JVM), it communicates with various memory areas of the JVM. Each thread of running application is a distinct instance of the virtual machine’s executions engine.
17. What is JRE? In which stage of Java life cycle JRE us used?
    1. Java Runtime Environment (JRE) – provide programming tools and deployment technologies.
    2. JRE – is the implementation of JVM and it is specially designed to execute java programs.
18. What is the syntax? Make a list of rules (you learned in class) you should always follow while creating your java application.
    1. Syntax in java: every line of code that runs in Java must be inside a class.
    2. A class should always start with uppercase first letter.
    3. NOTE: Java is case sensitive: “MyClass” and “myclass” has different meaning.
    4. The name of java file must match the class name.
19. How should we name our Java application?
    1. Java application/class should be in CamelCase convention.
    2. The file name must have the same name as the public class name in that file, which is the way to tell the JVM that this is an entry point.
20. Write a structure of a simple java application?
    1. Documentation section
    2. Package statement
    3. Import statements
    4. Interface statement
    5. Class definition
    6. Main method class
       1. Main method definition

Example of java application

Public class Helllo {

Public static void main (String[] args)

System.out.println(“Hello Java”); }

}

1. What is the importance of comments in the program? Mention different ways in which we can write comments in a program.
   1. Comments can explain what your application is about, or leave any value able comments without having an impact on the application.
2. Write a simple java program to print the “hello World” message. Keeping in mind stages of Java life cycle draw a flow chart to show journey of your first program.
   1. Public class HelloWord {

Public static void main (String [] args ); {

System.out.println(“Hello World”); }

}

1. What is file extension for Java executable code? At which stage of Java Life Cycle, we get executable code?
   1. .exe is the extension for executable code.
   2. Java codes are executed at last stage which is the third stage.
2. When does compile time starts?
   1. Compile time starts when the code is translated from a programming language to a language that machine understands.
3. Compile time ends with generation of which file?
   1. Compile file ends with generation of the Class file.
4. Can you run the program without compilation? Try running your first program without compilation and share result.
   1. Starting wit JAVA SE 11 and for the first time in the programming language’s history, you can execute a script containing Java code directly without compilation.
5. When does runtime start?
   1. Runtime is the final phase of the program lifecycle in which the machine executes the program’s code.
   2. Runtime starts after compilation of the code.
   3. Runtime is the period of time when a program is running a generally occurs after compile time.
6. During which phase .class file is loaded into memory runtime or compile time? Who loads .class file into memory?
   1. In phase 3, the JVM places the program in memory to execute it- this is known as loading; the JVM’s class loader takes the .class files containing the program’s bytecodes and transfers them to primary memory.