**CE251 JAVA PROGRAMMING**

**CHAROTAR UNIVERSITY OF SCIENCE & TECHNOLOGY**

**DEVANG PATEL INSTITUTE OF ADVANCE TECHNOLOGY & RESEARCH**

**Department of Computer Engineering**

**PRACTICAL - 1**

**Aim:**

**Introduction to Object Oriented Concepts, comparison of Java with other object-oriented programming languages. Introduction to JDK, JRE, JVM, javadoc, command line argument. Introduction to Eclipse or Netbeans IDE, or BlueJ and Console Programming.**

**CODE:**

* **Object Oriented Concepts:**
* Class
* Object
* Encapsulation
* Inheritance
* Polymorphism
* Abstraction
* **Comparison of Java with other object-oriented programming languages.**

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| **Java** | **C++** |
| No use of pointers. Supports references, thread and interfaces. | Use of pointers, structures, union. |
| Wide range of classes for various high level services. | Comparatively available with low level functionalities. |
| Multiple inheritance is partially done through interfaces. | Provide both single and multiple inheritance. |
| It doesn’t support this feature. | Supports operator overloading. |
| Platform independent, byte code generated works on every OS. | Platform dependent, must be recompiled for different platform. |

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| **Java** | **Python** |
| Java is both compiled and interpreted language, which is first compiled and then interpreted into a byte code. | Python is an interpreted programming language. |
| Define particular block by curly braces, end statements by ; | No need of semi colons and curly braces, uses indentation. |
| Strongly typed, need to define the exact datatype of variables. | Dynamic, no need to define the exact datatype of variables. |
| Multiple inheritance is partially done through interfaces. | Provide both single and multiple inheritance. |
| Java is much faster than python in terms of speed. | Expected to run slower than Java programs. |

* **Introduction to JDK, JRE, JVM, Javadoc:**
* **JDK** – **Java Development Kit** (in short JDK) is Kit which provides the environment to **develop and execute(run)** the Java program. JDK is a kit (or package) which includes two things
  1. Development Tools (to provide an environment to develop your java programs)
  2. JRE (to execute your java program).
* **JRE** – **Java Runtime Environment** (to say JRE) is an installation package which provides environment to **only run(not develop)** the java program(or application)onto your machine. JRE is only used by them who only wants to run the Java Programs i.e. end users of your system.
* **JVM** - **Java Virtual machine** (JVM) is a very important part of both JDK and JRE because it is contained or inbuilt in both. Whatever Java program you run using JRE or JDK goes into JVM and JVM is responsible for **executing the java program line by line** hence it is also known as interpreter.
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* **javadoc - javadoc tool is a document generator tool in Java programming language for generating standard documentation in HTML format. It generates API documentation. It parses the declarations ad documentation in a set of source file describing classes, methods, constructors, and fields.**

* **Command line argument.**
* The java command-line argument is an argument i.e. passed at the time of running the java program.
* The arguments passed from the console can be received in the java program and it can be used as an input.
* **Introduction to Eclipse or NetBeans** **IDE, or BlueJand Console Programming.**
* **Introduction to Eclipse:**  We use application Eclipse to edit, test, and run Java programs. It is called an IDE (Integrated Development Environment. In this little module, we introduce you to the basics of Eclipse. You will not completely understand the Java code we write; just concentrate on how we are using Eclipse. Besides showing you how to use the IDE in a basic fashion, we give instructions on how to set various preferences, e.g. ensuring that line numbers appear in the editing panel.
* **Introduction to NetBeans:**  NetBeans IDE is a free, open source, integrated development environment (IDE) that enables you to develop desktop, mobile and web applications. The IDE supports application development in various languages, including Java, HTML5, PHP and C++. The IDE provides integrated support for the complete development cycle, from project creation through debugging, profiling and deployment. The IDE runs on Windows, Linux, Mac OS X, and other UNIX-based systems.
* **Introduction to BlueJ:**  BlueJ is a windows based platform for Java Development Kit (JDK). It is a free Java environment started in 1999 by Michael Kolling and John Rosenberg at Monash University, Australia, as a successor to Blue. It requires to install JDK version 1.3 or more before installing BlueJ. It can be freely downloaded from its official website of BlueJ.
* **Introduction to Console Programming:** A console application is a program which runs in an command prompt window. An example of a console application is below: Console programs do not have the flash, nor the event-driven capabilities of a Windows application, however, they still have their place.