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M.S. Ramaiah Institute of Technology
(Autonomous Institute, Affiliated to VTU)
Department of Computer Science and Engineering

Course Name: Object Oriented Programming
Course Code: CS33
Credits: 3:0:0

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Faculty:
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An Overview of Java

Object-Oriented Programming

- Object-oriented programming (OOP) is at the core of Java.
- In fact, all Java programs are to at least some extent object-oriented.

Two Paradigms

1. Process-Oriented Model
2. Object-Oriented Programming

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An Overview of Java

Process-Oriented Model

- *This approach characterizes a program as a series of* linear steps (that is, code).
- The process-oriented model can be thought of as *code acting on data.*

Object-Oriented Programming

- This approach organizes a program around its data (that is, objects) and a set of well-defined interfaces to that data.
- An object-oriented program can be characterized as *data controlling access to code.*

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Abstraction

Abstraction is a process where you show only "**relevant**" data and "**hide**" unnecessary details of an object from the user.

We use abstract classes and interfaces to achieve abstraction in java.

Ex: Working of a Car, Working of a Projector, Working of a Computer Working of an ATM.

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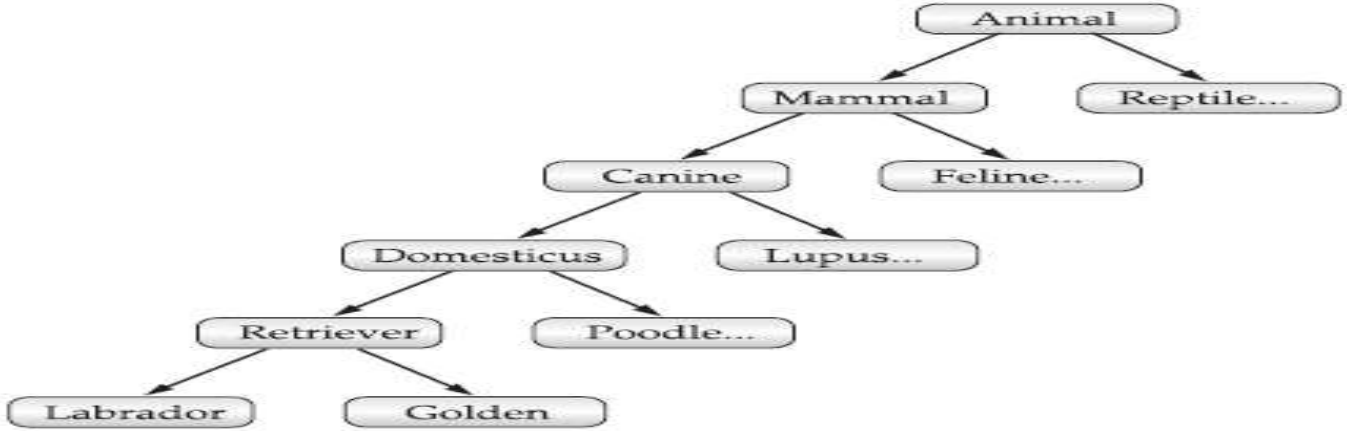
Three OOP Principles

1. Inheritance

- When one object acquires all the properties and behaviors of parent object i.e. known as inheritance.
- It provides code reusability.
- It is used to achieve runtime polymorphism.



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Three OOP Principles

1. Inheritance

- Without the use of hierarchies, each object would need to define all of its characteristics explicitly.
- However, by the use of inheritance, an object need only define those qualities that make it unique within its class.
- It can inherit its general attributes from its parent.
- Thus, it is the inheritance mechanism that makes it possible for one object to be a specific instance of a more general case.

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Three OOP Principles

2. Polymorphism

- Polymorphism is a feature that allows one interface to be used for a general class of actions.
- In java, we use method overloading and method overriding to achieve polymorphism.
- Ex: Your mobile phone, one name but many forms: as phone, as camera, as mp3 player, as radio.

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Three OOP Principles

3. Encapsulation

- Binding (or wrapping) code and data together into a single unit is known as encapsulation.
- Access to the code and data inside the wrapper is tightly controlled through a well-defined interface.
- A java class is the example of encapsulation.
- Ex: capsule, it is wrapped with different medicines.

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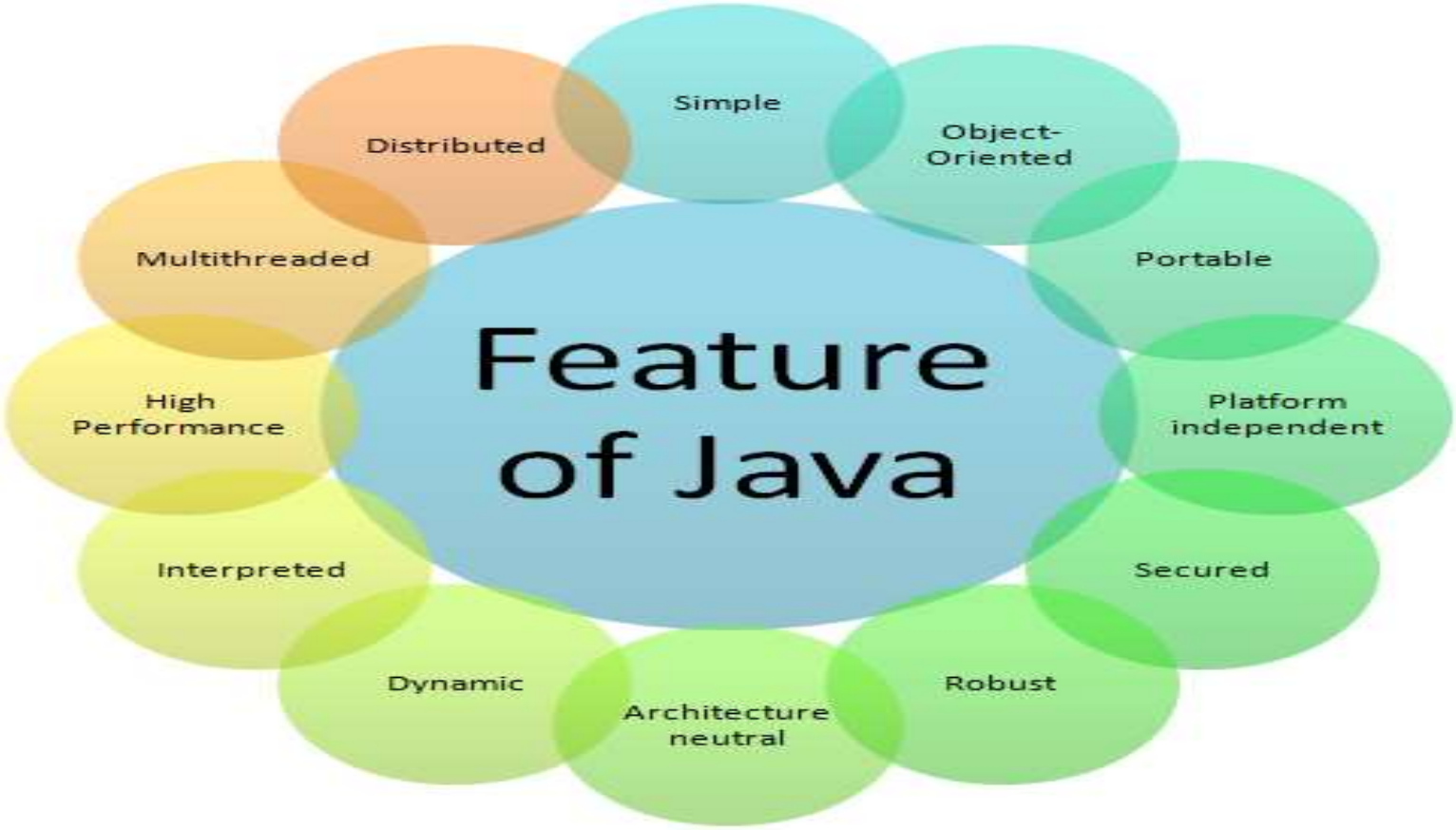
Java Buzzwords



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Java Buzzwords

Simple

- Java is a simple Language because it contains many features of other Languages like C and C++ and removes complexity because it doesn't support pointers, storage classes, goto statements and multiple inheritances.

Object Oriented

- Java is purely an Object Oriented Programming language i.e., all the code of the Java language is written into the classes and objects.

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Java Buzzwords

Distributed

- Java is a distributed language because, because of its ability to share the data and programs over the LAN.
- Access remote objects.

Multithreaded

- A Java program can be divided into multiple threads assigning different tasks for different threads and have all the threads executing in parallel.

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Java Buzzwords

Dynamic

- The JVM maintains a lot of runtime information about the program and the objects in the program.
- Libraries are dynamically linked during runtime.

Architecture Neutral

- Java follows “Write-once-run-anywhere” approach.
- Java programs are compiled into byte code format which does not depend on any machine architecture but can be easily translated into a specific machine by a JVM for that machine.

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Java Buzzwords

Portable

- In Java the size of the primitive data types are machine independent.
- Int in Java is always a 32-bit integer, and float is always a 32-bit IEEE 754 floating point number.

Interpreted & High Performance

- Java programs are compiled to portable intermediate form known as byte codes, rather than to native machine level instructions and JVM executes the byte codes on any machine on which it is installed.
- Just-in-time compiler.

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Java Buzzwords

Robust

- A Program or an application is said to be robust (reliable) when it is able to give some response in any kind of context.
- Java's features help to make the programs robust. Some of those features are: type checking, exception handling, etc.

Secured

- Java provides data security through encapsulation.

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Thank you