CORE JAVA MODULE

Contents

Basics of Java

The first chapter covers the fundamentals of the Java programming language, such as

- What is Java?
- History and Features of Java
- C++ vs Java
- Hello Java Program
- internal How to set the path?
- JDK, JRE, and JVM (Java Virtual Machine)
- JVM Memory Management
- Internal details of JVM
- Unicode System, Operators, Keywords, and Control Statements like if-else, switch, For loop, while loop, etc.

OOPs Concepts

The most essential topics in this chapter are object-oriented programming system (OOPs). You will learn about class, object, encapsulation, inheritance, polymorphism, and abstraction as part of the OOPs paradigm. For the objectives of the interview, all the issues are quite crucial.

Encapsulation

The following significant Topics are covered in this chapter.

- Encapsulation in Java
- How to achieve Encapsulation
- Data hiding
- Tightly encapsulated class
- Getter and setter method in Java
- Naming convention of getter and setter method

Inheritance

The following significant Topics are covered in this chapter.

- Inheritance in Java
- Is-A Relationship
- Aggregation and Composition(HAS-A)

- Types of inheritance: Single level, Multilevel, Hierarchical, Multiple, and Hybrid inheritance.

Polymorphism

The following significant Topics are covered in this chapter.

- Polymorphism in Java,
- Types of polymorphism: Compile-time polymorphism and Run-time polymorphism
- Static and Dynamic Binding
- Method overloading
- Method overriding
- Rules of method overloading and method overriding, various example programs related to rules of overloading and overriding.
- Covariant Return type

Abstraction

The following significant Topics are covered in this chapter.

- Abstraction in Java
- Abstract class
- Abstract method
- Interface in Java
- Nested interface, rules, and example programs.

Class, Object, and Types of classes

The most fundamental and core ideas of Java are covered in this chapter. They are as follows:

- Naming convention of Java
- Classes, Objects, and Features. It explains how to declare a class, how to create an object in Java.
- Object declaration and initialization
- Life cycle of an object
- Anonymous object in Java

Packages in Java

Packages in Java are covered in this chapter.

- How to declare package in a company project
- Package naming conventions
- Sub packages
- Types of packages such as user-defined packages, built-in packages
- Importing packages in Java

Data types in Java

The following Java concepts are covered in this chapter.

- Data types in Java
- Primitive data types
- Non-primitive data types
- Memory allocation of primitive and non-primitive data types, etc.

Variables, Constants, and Literals

Variables, constants, and literals are the three topics covered in this chapter and will cover the following subtopics.

- Variable declaration & initialization
- Naming convention
- Types of variables such as local variables, instance variables, and static variables
- Scope and memory allocation of variables.

Methods in Java

- Methods in Java
- Use of method in Java
- Method declaration, method signature
- Types of methods in Java: predefined method, user-defined methods: instance method, static method
- Calling of method
- Java main method
- Return type in Java.

Constructor in Java

You will learn about the following things in this chapter:

- What is Constructor in Java?
- Types of constructors: Default and Parameterized constructors
- Java constructor overloading
- Constructor chaining in java
- Copy constructor in Java

Modifiers in Java

This chapter covers Topics such as

- In Java, what is the difference between an access modifier and a non-access modifier?
- Private, default, protected, and public are examples of access modifiers.
- Types of Non-access modifiers like abstract, final, native, static, Strictfp, synchronized modifier, transient, volatile.

Static Keyword

The following significant Topics are covered in this chapter.

- What is Static keyword?
- Static variable
- Static method
- Static block, Instance block
- Static Nested Class in Java
- Difference between static variable and instance variable, static method and instance method, static block, and instance block.

Final Keyword

The following significant Topics are covered in this chapter.

- Final keyword
- Final variable
- Final method

- Final class.

Inner Class in Java

The following significant Topics are covered in this chapter.

- What is Inner class in Java?, Properties of the inner class, Instantiating inner class.
- Types of inner class in Java: Normal inner class, Method local inner class, Anonymous inner class, and Static nested class.

Super and this Keyword

The following significant Topics are covered in this chapter.

- Super keyword
- Calling of superclass instance variable
- Superclass constructor
- Superclass method.
- The second section deals with
- This keyword
- Calling of current class constructor, and method.

Garbage Collection

In this chapter, you'll learn about garbage collection in Java

Collections Framework

The following significant Topics are covered in this chapter.

- What is Collections Framework?
- List, Set, SortedSet, Queue, Deque, Map, Iterator, ListIterator, and Enumeration.
- ArrayList, LinkedList, HashSet, LinkedHashSet, TreeSet, ArrayDeque, PriorityDeque, EnumSet, AbstractCollection, AbstractList, AbstractQueue, AbstractSet, and AbstractSequentialList.
- Map, Map Entry, SortedMap, and NavigableMap
- HashMap, LinkedHashMap, TreeMap, IdentityHashMap, WeakHashMap, and EnumMap.

- Comparator, RandomAccess interfaces as well as Observable class.

Serialization

Serialization, Deserialization, and the Java temporary keyword are all covered in this chapter.

Exception Handling in Java

This chapter is extremely necessary for any Java technical exam or interview. This chapter will introduce you to

- Exception Handling in Java
- Try-catch block
- Multiple Catch Block
- Nested try block
- Finally block
- Throw Keyword
- Throws Keyword
- Throw vs Throws, Final vs Finally vs Finalize
- Exception Handling with Method Overriding Java Custom Exceptions

Java Annotations

This chapter deals with Java annotations, Built-In Java annotations like @Override, @SuppressWarnings, @Deprecated, @Target, @Retention, @Inherited, @Documented, Java custom annotations, and types of annotations.

String, String Buffer, String Builder

This is the most crucial chapter in the whole Java core curriculum. It will primarily cover three subjects, namely

- String,
- Immutable String
- String Comparision, String concatenation
- Substring
- StringBuffer class
- StringBuilder class

- To String method
- StringTokenizer class

Java Thread

- Java multithreading
- Multithreading life cycle of a thread creating
- Thread scheduler
- Sleeping a thread, Start a thread twice
- Calling run() method
- Joining a thread
- Naming a thread
- Thread priority,
- Daemon thread
- Thread pool
- Thread group
- Shutdownhook
- Java Synchronization: synchronized method, synchronized block, static synchronization
- Deadlock
- Inter-thread Communication
- Interrupting Thread

JDBC

This chapter is about

- JDBC Drivers
- Steps to connect to Database
- Connectivity with Oracle
- Connectivity with MySQL
- Connectivity with Access without DSN

- DriverManager
- Types of JDBC statements: Statement, Prepared statement, Callable statement
- Database Metadata, Resultset Metadata
- ResultSet, types of ResultSet,
- Storing image, Retrieving image
- Storing file, Retrieving file, Stored procedures, and functions
- Transaction Management
- Batch Processing
- JDBC New Features, Mini Project, and interview questions.