

Core Java COURSE

1) Basics of Java

- 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.

2) Class, Object, and Types of classes

- 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
- Class and Objects in Java with Realtime Example

3) Packages in Java

- 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

4) Data types in Java

- Data types in Java
- Primitive data types
- Non-primitive data types

5) Variables, Constants, and Literals

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

6) 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.

7) Constructor in Java

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

8) Modifiers in Java

- What is Access modifier and Non-access modifier in Java?
- Types of access modifiers like private, default, protected, and public
- Types of Non-access modifiers like abstract, final, native, static, Strictfp, synchronized modifier, transient, volatile.

9) Static Keyword

- Static variable
- Static method
- Static block, Instance block
- Static Nested Class in Java

10) Final Keyword

- Final keyword
- Final variable
- Final method
- Final class.

11) Inner Class in Java

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

12) Super and this Keyword

- Super keyword
- Calling of superclass instance variable
- Superclass constructor

- Superclass method.
- This keyword
- Calling of current class constructor, and method.

13) OOPs concepts

- class and object
- encapsulation
- inheritance
- polymorphism
- abstraction

14) 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

15) Inheritance

- Inheritance in Java
- Is-A Relationship
- Aggregation and Composition(HAS-A)
- Types of inheritance:
 1. Single level
 2. Multilevel
 3. Hierarchical
 4. Multiple
 5. Hybrid inheritance

16) Polymorphism

- Types of polymorphism
- Static and Dynamic Binding
- Method overloading
- Method overriding
- Rules of method overloading and method overriding
- Covariant Return type

17) Abstraction

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

18) Garbage Collection

19) Input Output Stream

- FileOutputStream, FileInputStream
- BufferedOutputStream, BufferedInputStream
- SequenceInputStream
- ByteArrayOutputStream, ByteArrayInputStream
- DataOutputStream, DataInputStream
- Java FilterOutputStream, Java FilterInputStream
- Java ObjectStream, Java ObjectStreamField
- Console
- FilePermissionWriter, Reader, FileWriter, FileReader
- BufferedWriter, BufferedReader
- CharArrayReader, CharArrayWriter

- `PrintStream`, `PrintWriter`
- `OutputStreamWriter`, `InputStreamReader`
- `PushbackInputStream`, `PushbackReader`
- `StringWriter`, `StringReader`
- `PipedWriter`, `PipedReader`
- `FilterWriter`, `FilterReader`, `File FileDescriptor`, `RandomAccessFile`, and `java.util.Scanner`.

20) Collections Framework

- 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.

21) Serialization & Deserialization

22) 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

23) Java Annotations

- Types of annotations
 1. @Override
 2. @SuppressWarnings
 3. @Deprecated

24) Reflection in Java

- Reflection API
- newInstance() & Determining the class object
- Javap tool, Creating javap tool
- Creating applet viewer
- Accessing private method from outside the class

25) Java Array

- Types of array:
 1. single dimensional array
 2. multidimensional array
- Passing array to a method
- Anonymous array in Java
- Cloning an array in Java

26) String, String Buffer, String Builder

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

- toString method
- StringTokenizer class

27) 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

28) JDBC

- JDBC Drivers
- Steps to connect to Database
- Connectivity with MySQL
- 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

29) Generics

- Simple generic example
- Generic class with multiple arguments
- Bounded generics
- Wildcard arguments
- Bounded wildcard
- Generic method
- Static generic method
- Erasure
- Generic with inheritance
- Bridge Methods
- Restrictions on generics
- Raw types

30) Explore util package

- Utility methods of the array
- Date & time
- Scanner class

31) I/O Programming in java

- File class
- Stream classes
- Reader/writer classes and Random access files

32)GUI programming

- GUI Basics
- GUI components – AWT
- Layout manager in JAVA
- Adding menus to window
- Introduction to Swing
- Images in java

33)Event handling

- Event-driver programming
- The delegation model
- Event classes & listeners
- Adapter classes