

Core Java Syllabus

1. Introduction of Java

- What is Java?
- Why Java ?
- Setting up the environment in Java
- A First Java Program
- Java Naming Conventions
- How JVM Works – JVM Architecture?
- Differences between JDK, JRE and JVM
- Run Program in Different IDE(Eclipse , NetBeans) and Command Prompt.

2. OOP concept

- Introduction to OOP Concept
- Inheritance in Java
- Encapsulation in Java
- Abstraction in Java
- Polymorphism in Java
- Why Java is not a purely Object-Oriented Language?

3. Data types , Variables and Arrays

- Java Identifiers
- Data types
- How to define our own data type in java(enum)
- Literals in Java (Numeric Literals, Character Literals, String Literals)
- Variable & Declarations of Variable
- Scope of Variables
- Final Variable
- Type Conversion and Casting
- Arrays

4. Operators and Expressions

- Expressions
- Arithmetic Operators
- Bitwise Operators
- Relational Operators
- Logical Operators
- Assignment Operator
- Increment and Decrement Operators
- The Conditional Operator
- Operator Precedence

5. Control Flow Statements

- Selection Statement (if , Switch)
- Iteration Statements (while, do-while , for , for each & Nested Loop)
- Jump Statements (break , Continue, Return)
- Does Java support goto?

6. Important Keywords

- List of all Java Keywords
- Important Keywords in Java
- this keyword
- super Keyword
- static keyword
- final keyword
- final, finally and finalize in Java
- abstract Keyword
- transient keyword in Java
- volatile keyword in Java
- strictfp keyword

7. Classes and objects

- Classes and Objects
- Java object storage
- Different ways to create objects in Java
- Association, Composition and Aggregation
- Access and Non-Access Modifiers in Java
- Access Modifiers
- this reference
- Object class
- Static class in Java
- Method Overloading
- Method Overriding
- Understanding “static” in “public static void main” in Java
- Overloading or Overriding static methods
- Shadowing of static methods(Also called Method Hiding)
- Static methods vs Instance methods in Java
- Assigning values to static final variables in Java
- Covariant return types
- Flexible nature of java.lang.Object
- Overriding equals method of Object class
- Overriding toString() method of Object class

- Instance Variable Hiding
- Static blocks in Java
- initializer block in java
- instance initializer block in java(non-static block)
- Static vs Dynamic Binding

8. Constructor in Java

- Constructors
- Constructors in Java
- Default constructor
- Assigning values to static final variables
- Copy Constructor
- Constructor Chaining
- Private Constructors and Singleton Classes
- Singleton Class
- Constructor Overloading

9. Inheritance in Java

- Inheritance in Java
- Multiple Inheritance
- Why Java doesn't support Multiple Inheritance – The Diamond Problem
- Java Object Creation of Inherited Class
- Inheritance and constructors
- Interfaces and Inheritance
- Using final with Inheritance
- Override private methods
- More restrictive access to a derived class method in Java
- Parent and Child classes having same data member
- Object Serialization with Inheritance
- Referencing Subclass objects with Subclass vs Superclass reference
- Does overloading work with inheritance

10. Packages

- Packages Introduction
- java.io package
- java.lang package
- java.util package

11. Exception Handling

- Exceptions
- OutOfMemoryError Exception

- Different ways to print Exception messages in Java
- flow control in try-catch-finally
- Types of Exceptions
- Catching base and derived classes as exceptions
- Checked vs Unchecked Exceptions
- Throw and Throws
- User-defined Custom Exception
- Infinity or Exception?
- Multicatch
- Chained Exceptions
- Null Pointer Exception

12. Input/output Streams

- Character Stream Vs Byte Stream
- DoubleStream mapToObj() in Java
- Command Line arguments
- Scanner Class
- Scanner and nextChar()
- Scanner vs BufferedReader Class
- Formatted output
- Fast I/O for Competitive Programming
- Reading input from console

13. Collection Framework

- The Collections Framework
- The Set Interface
- Set Implementation Classes
- The List Interface
- List Implementation Classes
- The Map Interface
- Map Implementation Classes

14. Interfaces and Abstract Classes

- Interfaces
- Access specifier for methods in interfaces
- Access specifiers for classes or interfaces
- Abstract Classes
- Difference between Abstract Class and Interface in Java
- Comparator Interface
- Java Interface methods
- Nested Interface

- Nested Classes in Java
- Inner class in java
- Local Inner Class in Java
- Anonymous Inner Class in Java
- Functional Interfaces
- What is a Marker interface
- Questions on Abstract Classes and Interfaces
- Static method in Interface in Java
- Function Interface in Java

15. Multithreading

- Introduction to Multithreading
- Lifecycle and states of a thread
- Main thread
- Methods to prevent thread execution
- inter thread communication
- Java.lang.Thread class
- Start() function in multithreading
- Java Thread Priority
- Joining Threads in Java
- Naming a thread and fetching name of current thread in Java
- Synchronization
- Method and Block Synchronization
- Producer-Consumer solution
- Thread Pools in Java
- Semaphore in Java
- Java.util.concurrent.Semaphore class in Java
- CountdownLatch
- Deadlock in java
- Daemon thread
- Reentrant Lock
- Cyclic Barrier in Java
- Callable and Future in Java
- Runtime Class

16. File Handling in Java

- File class
- Ways of Reading a text file in Java
- file permissions in java

17. Strings in Java

- String Class
- StringBuffer Class
- StringBuilder Class
- StringTokenizer class
- StringJoiner in Java8

18. Reflection

- Reflection in Java
- Method Class in Java
- Reflect Array class in Java
- util.Arrays vs reflect.Array in Java
- new operator vs newInstance()
- instanceof operator vs isInstance()

19. Annotations in Java

- Introduction
- Built-In Java Annotations
- Java Custom Annotations

20. Useful and/or Advanced Features

- Generics
- Wildcards in Java
- Assertions
- Annotations
- Serialization and Deserialization
- Lambda Expressions – Java 8
- Stream
- BigInteger Class

21. Applets , AWT and Swing in Java

- Introduction to applets
- Architecture of Applets
- Event Handling in Applets
- AWT Controls
- Event Handling in AWT
- Basic Difference Between Swing and Applets
- Swing Controls
- Event Handling in Swing

22. JDBC

- Introduction to JDBC
- Architecture of JDBC
- Type of JDBC Architecture
- Difference Between ODBC and JDBC
- Driver Types
- Statement Objects
- Resultset
- Transaction Processing

Selenium Testing

Oops concepts –

Selenium:

Architecture of Selenium Webdriver

Architecture of Webdriver API

WEB ELEMENT:

Locators

SYNCHRONIZATION

1. Implicit Wait
2. Explicit Wait

Few Sample Codes

Handling Listbox

POM Concept in selenium

TestNG

TestNG Suit

POM: Page Object Model

Page Factory in Selenium

Framework

AUTOMATION FRAMEWORK DESIGN

Steps to configure Automation Framework

JENKINS

Architecture of the framework

Automation Framework Design Details:

Architecture Details

Handling Pop-up's

List of Exceptions