Java + DSA Training by Regex (45-60 days)

Module 1- Introduction

- Types of Programming language and Paradigms.

- Java – what, where and why?

- Platform independency

- Comparison in Java with C and C++

- Role of Java Programmer in Industry.

- Java Evolution and History Features of Java Language.

- The Java Virtual Machine (JVM) – The heart of Java.

- Java's Magic Byte code

- JDK , JRE and JIT

Module 2– Language Fundamentals or Grammar of Java

- Java Source File Structure

- Introduction to VI, notepad, edit plus editor and Net beans, Eclipse IDE.

- Compilation and Executions procedure using different editor and IDE. Reference parameters, Output parameters.

- Access specifiers and its requirement in java.

- Naming conventions

Module 3- Reserve / Keywords present in Java

- Lexical Tokens, Identifiers

Module 4- Primitive Data types and Block in java

- Data types int , char , float , double , Boolean , short , long , byte

- UNICODE system Value type, Reference type.

- Types and Scope of variables Static variables, Instance variable, Local variables, final variable, transient variable, volatile variable.

- Static block and Non-static block.

- Static,non-static,final,abstract, native and synchronized Communicate java application with other language using java native interface

Module 5- Java Operators

- Arithmetic operators,

- Relational operators,

- Logical operators,

- Shift operators

- Assignment Operators,

- Unary operator

- Bitwise operators,

- Special operators.

- Ternary operator

- Instanceof operator and typecasting.

Module 6- Wrapper Class

- Integer

- Character

- Float Double

- Boolean Short Long

- Type conversions Implicit conversion, Explicit conversion

Module 7- Decision making and branching
PROGRAMMING WITH JAVA

- If statement

- If....Else statement and if....else ladder.

- Nested if Multiple if Switch...

- case statement Conditional operator vs.

- if statement

- Break and continue in java

Module 8- Decision making and looping

- While

- Do

- For

- For each

Module 9- Object Oriented Programming

- Class Fundamentals.

- Object & Object reference.

- Life time of object & Garbage Collection.

- Creating with Operating reference and Objects.

- Constructor & initialization code block.

- Access Control, Modifiers, methods Nested, Inner Class & Anonymous Classes Abstract Class & Interfaces

- Defining Methods, Argument Passing Mechanism

- Method Overloading,

- Recursion.

- Dealing with Static Members.

- Finalize () Method.

- Native Method.

- Use of ″this″ reference.

- Use of Modifiers with Classes & Methods.

- Design of Accessors and Mutator Methods

- Cloning Objects, shallow and deep cloning

- Generic Class Types

Module 10- Extending Classes and Inheritance

- Aggregation (HAS-A) and its uses.

- Use and Benefits of Inheritance

- (IS-A) over aggregation in OOP.

- Types of Inheritance in Java Role of Constructors in inheritance

- Polymorphism in OOP.

- Overriding Super Class Methods.

- Use of ″super″ keyword.

- Restriction in case of method overriding.

- Type Compatibility and Conversion

- Implementing interfaces.

- Dynamic method dispatching by down-casting and up-casting

Module 11- Package

- Organizing Classes and Interfaces in Packages.

- Package as Access Protection Defining Package.

- Advantage of package Sub-Package CLASSPATH Setting for Packages.

- Making JAR Files for Library Packages

- Import and Static Import

- Creating .EXE and jar executable file.

Module 12- Exception Handling

- The Idea behind Exception
- Exceptions & Errors
- Types of Exception
- Checked and Un-Checked Exceptions
- Control Flow in Exceptions
- Use of try and catch block
- Multiple catch block
- Nested try
- finally block
- throw keyword
- Exception Propagation
- throws keyword
- Exception Handling with Method Overriding
- In-built and User Defined Exceptions
- Exception handling rule in case of method overriding.
- How to handle unreachable statements using finally.

Module 13- Array & String

- Defining an Array
- Single–Dimensional Array Initializing & Accessing Array Multi – Dimensional Array
- Jagged Array
- Arrays class Methods in Arrays class
- Sorting the elements of Array Searching, insert, delete dynamically. Matrix multiplication, addition, transpose, upper triangular, lower triangular, sparse matrix.

- String – what and why Operation on String Immutable String String comparison and concatenation Method of String class StringBuffer class and its methods.

- StringBuilder class in java. Creating Immutable class like String.

- Using Collection Bases Loop for String Tokenizing a String Object comparisons using Comparator and comparable interface

Module 14- Dancing and Singing together "Multithreading "In Java

- Understanding Threads and process.

- Multithreading – what and why Creating Thread Thread Life-Cycle

- Thread Priorities

- Daemon thread Performing multiple job by multiple Thread.

- Runnable class.

- Synchronizing Threads – what and why Synchronized method

- Synchronized block

- Inter Communication of Threads Producer & Consumer problem without balancing

- Producer & Consumer problem with balancing using wait() & notify().

Module 15- Input/output Operation in Java (java.io Package)

- Streams and the new I/O Capabilities Understanding Streams File class and its methods.

- Creating file and folder using java code.

- The Classes for Input and Output

- FileOutputStream & FileInputStream

- FileWriter & FileReader

- Input from keyboard by InputStreamReader

- Input from keyboard by Console Input from keyboard by Scanner
  PrintStream class

- PrintWriter class

- BufferedReader and BufferedWriter class.

- Compressing and Uncompressing File.

- Reading and Writing data simultaneously

- DataInputStream and DataOutputStream

- The Standard Streams

- Working with File Object

- Java & XML Data Binding

Module 16- Database Programming using JDBC

- Introduction to JDBC
- Steps to connect to the database JDBC Drivers & Architecture
- Types of JDBC Drivers.
- Connectivity with Oracle
- Connectivity with MySQL

Module 17- The Collection Frameworks

The Collection Interfaces
The Collection Interface
The List Interface
The Set Interface
The SortedSet Interface
The NavigableSet Interface
The Queue Interface

The Deque Interface

The Collection Classes

The ArrayList Class

The LinkedList Class

The HashSet Class

The LinkedHashSet Class

The TreeSet Class

The PriorityQueue Class

The ArrayDeque Class

The EnumSet Class

Accessing a Collection via an Iterator

Using an Iterator

The For-Each Alternative to Iterators

Storing User-Defined Classes in Collections

The RandomAccess Interface

Working with Maps

The Map Interfaces

The NavigableMap Interface

The Map Classes

Comparators

Using a Comparator

The Collection Algorithms

The Enumeration Interface Vector

Stack

Dictionary

Hashtable

Properties

Using store( ) and load( )