CREDO SYSTEMZ
Simplifying IT

Core Java Training Course Content

SECTION 1: INTRODUCTION

- ➢ Introduction about Programming Language Paradigms
- ➢ Why Java?
- ➢ Flavors of Java.
- ➢ Java Designing Goal.
- ➢ Role of Java Programmer in Industry
- ➢ Features of Java Language.
- ➢ Installing Java
- ➢ Difference between JDK,JRE and JVM
- ➢ JVM –The heart of Java .
- ➢ Java Architecture
- ➢ Java's Magic Bytecode.

SECTION 2: JAVA SAMPLE PROGRAM

- ➢ Java Program Development.
- ➢ Java Source File Structure.
- ➢ Compilation & Execution
- ➢ Rectifying common errors
- ➢ Lexical Tokens
- ➢ Identifiers
- ➢ Keywords
- ➢ Literals and Comments
- ➢ Command Line Arguments

Lab Task:

Print Hai! in the first line and print Hello how are you !! in the second line using single print statement.

Get the Input 10 25 a 1.2 Rama via command line arguments and print the values one by one.

SECTION 3: PROGRAMMING FUNDAMENTALS

- ➢ Data types
- ➢ Difference between Primitive & Non Primitive Datatypes
- ➢ Variable Declaration & Initialization

➢ Type Casting
➢ Operators and its types

Lab Task:

Swap the values with using temporary variable and without using temporary variable.

Find the maximum of two numbers and three numbers using ternary operator.

SECTION 4: CONTROL STRUCTURE AND LOOPING STATEMENTS

➢ IF conditions
➢ IF-ELSE conditions
➢ Nested IF conditions
➢ ELSE-IF Ladder conditions
➢ SWITCH-CASE statements
➢ The "break" and "continue" keywords
➢ "FOR" Loop
➢ Different forms of FOR Loop
➢ "WHILE" Loop
➢ "DO-WHILE" Loop
➢ ENHANCED "FOR" Loop
➢ Nested Loops

Lab Task:

Find the maximum of 2 numbers and 3 numbers without using ternary operator.

Print the factorial of 5!

SECTION 5: OOPS INTRODUCTION AND BASICS

➢ What is OOPS?
➢ Necessity and Advantage of OOPS
➢ OOPS Designs with real-time examples.
➢ What is mean by class and object?
➢ Relation between a Class and an Object
➢ How to create class and object
➢ User-defined / Custom Datatypes

Lab Task:

Give the real time example for Object and describe its properties and functionalities.

Analyse the OOPs Concepts and give real-time examples of all OOPS concepts in your own thinking.

SECTION 6: OOPS BASICS (CLASSES & OBJECTS)

- ➢ Components of a Class
- ➢ Types of Variables and its uses.
- ➢ Method Advantages, Categories and Types
- ➢ Constructor advantages and its types
- ➢ Ways to initialize the Object
- ➢ "this" keyword
- ➢ Static Block & Instance Block
- ➢ Nested classes

Lab Task:

Get the real time examples for static variables, final variables and instance variables in your own thinking.

Create the Class Student with School name – "Gandhi School", roll_no and name. Create the objects and assign the roll_no and name values using the constructor and display the student details using methods.

SECTION 7: OOPS CONCEPTS – INHERITANCE

- ➢ Inheritance and its advantages
- ➢ The "extends" keyword
- ➢ Types of Inheritance
- ➢ Single Inheritance
- ➢ Multilevel Inheritance
- ➢ Multiple Inheritance
- ➢ Hierarchical Inheritance
- ➢ Hybrid Inheritance
- ➢ Difference between IS-A and HAS-A relationship
- ➢ Use of "super" keyword and forms of "super" keyword

Lab Task:

Try to get the real time scenarios for all kinds of inheritance in your own thinking.

In College, We are having 3 kinds of Teachers. For Ex: English Teacher, Tamil Teacher, Maths Teacher. These Teachers having different main subjects but their designation is 'Teacher', college is 'Nehru College' and functionality is 'teaching'. Achieve this using Inheritance and display the details of 3 teachers.

SECTION 8: OOPS CONCEPTS – ABSTRACTION

- ➢ Abstraction and its advantages
- ➢ Abstract Class and Abstract Methods

- ➢ The "abstract" keyword
- ➢ Implementation of Abstract Methods
- ➢ Uses of Abstract Classes
- ➢ Interface and its advantages
- ➢ 'implements' keyword
- ➢ Achieve Multiple Inheritance with Interface
- ➢ Difference between Abstract Class and Interface

Lab Task:

Eating and traveling functionalities are mandatory for all Animals. But food and traveling paths are different. Display the food and traveling paths for different animals. (use interface)

All the banks should have a rate of interest. But it's varied from bank to bank. Display the rate of interest for all banks. (use interface)

SECTION 9: OOPS CONCEPTS – POLYMORPHISM

- ➢ Polymorphism and its advantages
- ➢ Types of Polymorphism
- ➢ Types of Binding
- ➢ Method Overloading and its uses.
- ➢ Conditions of Overloading
- ➢ Method Overriding
- ➢ Scenario of Overriding
- ➢ Difference between Overloading and Overriding
- ➢ About Class Casting
- ➢ About Design Patterns.

Lab Task:

Print the String, Integer, Float values using Method Overloading.

Create Superclass "Human" with eating functionality. Create subclasses Young Boy, Women, Baby etc., and Override the eating functionality. Print the favorite food for humans.

SECTION 10: OOPS CONCEPTS – ENCAPSULATION ALONG WITH PACKAGES

- ➢ What is package and its advantages
- ➢ Types of packages
- ➢ Static Import
- ➢ Access Modifiers
- ➢ Encapsulation

Lab Task:

We are having Class AOne. In this class create static variables and static methods. And try to access these variables and methods in Package B classes without using class name and creating any object.

Create the class Account with account number and account balance as private members. Set the Account number and deposit the amount. Show the Account Balance. Write the program to achieve this by using Data Encapsulation.

SECTION 11: ARRAYS AND STRINGS

- ➢ What is Array and its advantages
- ➢ Types of Array
- ➢ Jagged Array
- ➢ String, String Buffer, String Builder

Lab Task:

Matrix Addition, Multiplication, Transpose

Count the number of vowels, consonants, special characters in the following String: "-God is Great!-"

SECTION 12: LOGICAL PROGRAMMING ON ARRAYS AND STRINGS

Interview related logical programs:

- ➢ Rotate the Array Elements

Input – {1,2,3,4,5}

Output – 5 1 2 3 4

4 5 1 2 3

3 4 5 1 2

2 3 4 5 1

1 2 3 4 5

- ➢ Sort the Array using different algorithms. (Bubble Sort, Selection Sort, Insertion Sort, Quick sort, Merge Sort)
- ➢ Searching the value in Array (Linear Search & Binary Search)
- ➢ Find the Median value and Mode value in Array
- ➢ Find the Second highest and Second smallest value in array
- ➢ Find and print the duplicate elements in array

SECTION 13: LOGICAL PROGRAMMING

Interview related logical programs:

- Display Prime Numbers, Armstrong numbers, Perfect Numbers, Strong Numbers up to range or between the ranges
- Sum of Digits/ Reverse a number
- Convert decimal number to binary format

SECTION 14: EXCEPTION HANDLING

- What is Exception and its types
- How to handle exception?
- Multiple catch blocks
- Finally block
- Difference between throw and throws
- Custom Exception

Lab Task:

Write a program to generate the Null Pointer Exception and Number Format Exception. Handle these exceptions with multiple catch blocks.

Create the custom exception called "AgeExceedException".

Get the age from user. If age exceeds 35 then throw the AgeExceedException with message "You are not eligible candidate to apply for this position".

SECTION 15: JAVA UPDATED FEATURES AND OOPS MISC

- Varargs
- Autoboxing and Autounboxing
- EnumType
- Annotation
- Custom Annotation and its types
- Assertion

OOPS MISCELLANEOUS

- Object Class
- Object Cloning (Shallow Copy and Deep Copy)
- Wrapper Class
- Java Recursion

Lab Task:

Get the Age from user. If age is less than 18 then display "You are not eligible for voting" using assertion.

Print 1 to 10 using recursion

Print Fibonacci Series using recursion

SECTION 16: IO PACKAGE

- ➢ Stream and its types
- ➢ Read, Write and Copy Files
- ➢ Serialization
- ➢ Marker Interface
- ➢ "transient" keyword

Lab Task:

Get the console Input using BufferedReader.

Create the File having following Content :

Credo Systemz is best (way of teaching) and the study materials are really excellent.

Read the File and Find the String within the ( ) opening and closing paranthesis. And write the String in another File.

SECTION 17: DATABASE

- ➢ What is Database?
- ➢ What is MySQL?
- ➢ Parts of MySQL
- ➢ Operators and Clauses in MYSQL.
- ➢ Functions and procedures in MYSQL.

Lab Task:

Create a Database "shop" with tables and appropriate fields in your own thinking.

Create the Table Employee with Employee number, name and salary.

SECTION 18: JDBC

- ➢ What is JDBC?
- ➢ Types of Drivers
- ➢ Loading the drivers
- ➢ Connection, Statement, PreparedStatement, CallableStatement, ResultSet Interfaces
- ➢ Batch Updates

Lab Task:

Get the Employee details emp_no, name, salary, address from the user and store the values into database using Prepared Statement with batch update.

Display the Employee details from database those who are having salary more than 7000 using ResultSet.

SECTION 19: MULTITHREADING

- ➢ What is multithreading and advantages.
- ➢ What is Thread?
- ➢ Life Cycle of a Thread.
- ➢ Thread Classes and Methods
- ➢ "Runnable" Interface
- ➢ Creating Thread
- ➢ Working with multiple Threads.
- ➢ Java Synchronization
- ➢ Interthread Communication
- ➢ Dead Lock

Lab Task:

Create 3 threads. Each thread has to print Multiplication tables (2 tables, 3 tables, 4 tables) simultaneously.

Print 5 Divisables and 2 divisables upto 50 using synchronization.

SECTION 20: UTIL PACKAGE

- ➢ Regular Expression
- ➢ String Tokenizer
- ➢ Scanner & Date Classes
- ➢ Localization & Internationalization
- ➢ Java Collections Introduction

Lab Task:

Get the String "Java*programming*language" using Scanner Class. Split the String by using delimiter (*) and display the tokens and count the number of tokens using String Tokenizer.

Get the String "Java is my favourite language. Java is my profession" from user. Search and display the text java and index position of java using regular expression.

SECTION 21: UTIL PACKAGE – COLLECTIONS FRAMEWORK

- ➢ The "Collection" Interface
- ➢ List, Set and Map Interfaces
- ➢ Cursors in java and its differences
- ➢ Difference between the implementation classes of List, Set and Map

Lab Task:

Remove duplicate words and characters from String using Collections.

Get the employee names from the database and store the employee names in List. Display the names in ascending order and descending order using ListIterator.

SECTION 22: GENERICS IN COLLECTIONS FRAMEWORK

- ➤ Generics in Java
- ➤ Types of Generics
- ➤ Uses and Limitations of Generics
- ➤ Custom objects with Generic collections
- ➤ Sorting in Collections

Lab Task:

Create the class employee with name, employee_number, phone. And store the employee objects in generic collections.

Sort the custom object generic collection by employee name.

SECTION 23: NETWORKING & SWINGS

- ➤ Basic terms in networking
- ➤ Socket Programming
- ➤ Introduction about Swings
- ➤ Components in Swings
- ➤ Events Handling

Lab Task:

Get the Registration Details (Name, Gender, Phone_number, State, Country) from the user using Swings UI. And store the values in Database.

SECTION 24: ECLIPSE FEATURES AND LATEST JAVA VERSION FEATURES

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