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Grow With Us

Course: Java Programming

Course Description:

This course provides a comprehensive introduction to the Java programming language, focusing on fundamental concepts and techniques for building software applications. Students will learn the syntax, principles, and best practices of Java programming through hands-on exercises and projects.

Course Objectives:

- Understand the core principles and features of the Java programming language.
- Gain proficiency in Java syntax, data types, and control structures.
- Develop skills to design and implement object-oriented programs.
- Learn how to work with Java libraries and APIs.
- Explore best practices and coding standards for Java programming.

Course Outline:

Week 1: Introduction to Java, Syntax and language Fundamentals

- Overview of Java and its role in software development.
- Setting up the Java development environment.
- Introduction to Java development tools (e.g., Eclipse, IntelliJ).
- Variables, data types, operators, and expressions.
- Control structures: if-else, loops, switch-case.
- Input/output and exception handling.

Week 2: Object-Oriented Programming in Java & Java Collections Framework

- Principles of object-oriented programming (OOP).
- Classes, objects, and methods.
- Encapsulation, inheritance, and polymorphism.
- Introduction to the Java Collections Framework.
- Working with lists, sets, and maps.
- Iteration and manipulation of collection elements.

Week 3: Input/Output and File Handling as well as GUI Programming with Swing

- Reading from and writing to files.
- Streams and serialization.
- Working with directories and file systems.
- Introduction to graphical user interface (GUI) programming in Java.
- Designing and building Swing-based user interfaces.

- Event-driven programming and event handling.

Week 4: Exception Handling and Debugging along with Multithreading and Concurrency

- Understanding exceptions and exception handling in Java.
- Techniques for effective error handling and debugging.
- Logging and error reporting.
- Introduction to multithreading in Java.
- Synchronization and thread coordination.
- Handling concurrent programming challenges.

Week 5: Database Connectivity with JDBC along with Java Libraries and APIs

- Introduction to database concepts and SQL.
- Connecting Java applications to databases using JDBC.
- Performing database operations and handling result sets.
- Working with commonly used Java libraries and APIs.
- String manipulation, date/time, regular expressions.
- Introduction to networking and web services.

Week 6: Java Best Practices and Design Patterns

- Coding standards and best practices in Java programming.
- Introduction to design patterns and their application in Java.
- Writing efficient and maintainable code.

Week 7: Project Development

- Applying learned concepts and techniques to develop a Java application.
- Collaborative project development in teams.
- Project management and software development lifecycle.

Grading Criteria:

- Quizzes and Assignments: 40%
- Java Programming Projects: 50%
- Class Participation: 10%