



J1 - Version: 1
22 September 2021

java fundamentals



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 6 days Course

Description:

This course introduces the participant to the fascinating and dynamic world of Java Object Oriented programming.

The first part of the course focuses on object-based concepts. We begin by exploring the history and origins of the Java programming language. From there, we go on to understanding the structure of the Java platform by focusing on its ability to write and compile only once, and still run on various machines using different Java Virtual Machines (JVM). The Object Oriented part of the course goes through inheritance concepts and implementations, the collections framework, handling exceptions and running multiple threads applications. We conclude the course by delving into the IO capabilities of Java as well as their usage in networking.

Intended audience:

Non-programmers who wish to learn how to program in java

Prerequisites:

A good working knowledge of at least one programming Object Oriented language
For student who has experience with non-object oriented programming language must take the 1 day course introduction to object oriented, usually this day course preformed before this course in few days

Objectives:

Upon completion of this course, the participant will be able to develop complicated Object Oriented Java applications including client-server programs.

Topics:

Introduction to Java

- History
- Key Features
- Java platform independence
- Hello world example
- Eclipse workshop
- packaging and compiling

Variables

- Units of memory
- Representation of Numbers
- What are Variables?
- When Do We Need Variables?
- Variable Definition
- Variable Types
- Displaying Variable's Value
- Mathematical Expressions
- Assigning a Value to a Variable
- Integer Division and Modulo
- Expressions
- Assignment Operators
- Increment Operators
- Variable Naming Rules
- Type Conversion
- Mixed Type Operation
- Switching Values Between Two Cells
- Class Math
- Summary

Introduction to Classes

- Classes
- Class Declaration

- Class Data Members
- Methods
- Method Declaration
- Methods and Events
- Public \ Private
- Summary

Conditions

- Boolean Logic
- Conditions
- if
- Logical Operators
- Nested Conditions
- Indentation
- Input Validation Check
- Switch Case
- Summary

loops

- The problem
- The solution
- While loop
- Limit the while loop
- For loop
- Controlling steps size
- Careful! Infinite loops
- Do while loop
- The break statement in a for structure
- The continue statement
- Nested loops
- Summary

Arrays

- What Is An Array?
- Array Declaration
- Array Instantiation
- Array Initialization
- Access Elements
- Arrays – Length
- Arrays vs. simple variables
- Finding the largest value in array
- The ListBox control
- Arrays synchronization
- Sorting arrays: Bubble sort
- Searching elements in arrays: Binary search vs. sequential search
- Multi-dimensional arrays
- Summary

More About Methods

- What is a method?
- Why are methods so important?
- Adding a method to the window
- Method parameters
- Calling a method
- Passing arguments to methods by reference vs. by value
- Receiving value type parameters as reference – ref keyword
- ref and out keywords
- Summary

Roni The Robot Tutorial

- Using Object Example
- Illustrate the Power of the Object-Oriented Programming

OOP

- What is Object-Oriented Programming?
- What is an object?

- Object declaration
- Classes
- What is a class?
- Data member declaration
- Object state and behavior
- Object operation
- Method declaration
- Public and private – the accessibility keywords
- Public and private - why?
- Properties
- Object interface and implementation
- Object structure
- Constructors
- Object interactions
- Object system
- Summary

Inheritance and Polymorphism

- Paradigm introduction
- Inheritance
- Using a derived class
- Constructors and inheritance
- Virtual methods
- The problem of derived classes accessibility
- The “protected” accessibility level
- Polymorphism
- The root of all classes: Object
- Summary