Java

1 Introduction to Java Applications

Introduction

First Program in Java: Printing a Line of Text

Modifying Our First Java Program

Displaying Text with printf

Another Java Application: Adding Integers

Memory Concepts

Arithmetic

Decision Making: Equality and Relational Operators

2 Introduction to Classes and Objects

Introduction

Classes, Objects, Methods and Instance Variables

Declaring a Class with a Method and Instantiating an Object of a Class

Declaring a Method with a Parameter

Instance Variables, set Methods and get Methods

Primitive Types vs. Reference Types

Initializing Objects with Constructors

Floating-Point Numbers and Type double

3 Control Statements: Part I

Introduction

Algorithms

Pseudocode

Control Structures

if Single-Selection Statement

if...else Double-Selection Statement

while Repetition Statement

Formulating Algorithms: Counter-Controlled Repetition

Formulating Algorithms: Sentinel-Controlled Repetition

Formulating Algorithms: Nested Control Statements

Compound Assignment Operators

Increment and Decrement Operators

Primitive Types

4 Control Statements: Part 2

Introduction

Essentials of Counter-Controlled Repetition

for Repetition Statement

Examples Using the for Statement

do...while Repetition Statement

switch Multiple-Selection Statement

break and continue Statements

Logical Operators

Structured Programming Summary

5 Methods: A Deeper Look

Section 6.1. Introduction

Section 6.2. Program Modules in Java

Section 6.3. static Methods, static Fields and Class Math

Polymorphism Examples

Demonstrating Polymorphic Behavior

Abstract Classes and Methods

Case Study: Payroll System Using Polymorphism

final Methods and Classes

Case Study: Creating and Using Interfaces

(Optional) GUI and Graphics Case Study: Drawing with Polymorphism

10 Exception Handling

Section 11.1. Introduction

Section 11.2. Exception-Handling Overview

Section 11.3. Example: Divide By Zero Without Exception Handling

Section 11.4. Example: Handling ArithmeticExceptions and InputMismatchExceptions

Section 11.5. When to Use Exception Handling

Section 11.6. Java Exception Hierarchy

Section 11.7. finally block

Section 11.8. Stack Unwinding

Section 11.9. printStackTrace, getStackTrace and getMessage

Section 11.10. Chained Exceptions

Section 11.11. Declaring New Exception Types

Section 11.12. Preconditions and Postconditions

Section 11.13. Assertions

11 Files and Streams

Introduction

Data Hierarchy

Files and Streams

12 Generics