uCertify

Starting out with Programming Logic & Design

Lesson Practice test Live-Lab

24 Mar 2023

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Get hands-on experience in complex programming with the Programming Logic & Design course and lab. The course provides a vivid introduction to current programming languages with clear and approachable code snippets and programs for better understanding. The course and lab offer easy-to-understand pseudocode, flowcharts, and other tools. It illustrates how to design the logic of programs with a firm emphasis on logical thought processes and models. Programming Logic & Design uses a language-independent approach to teach programming concepts and problem-solving skills.

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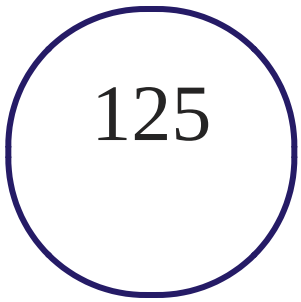

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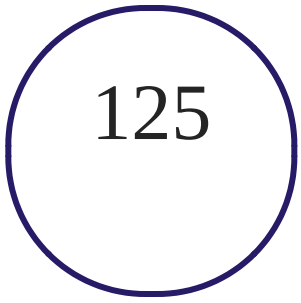

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1: Preface

- Changes in the Fifth Edition
- Brief Overview of Each Lesson
- Organization of the Text

- Features of the Text

2: Introduction to Computers and Programming

- Introduction
- Hardware
- How Computers Store Data
- How a Program Works
- Types of Software
- Review Questions

3: Input, Processing, and Output

- Designing a Program
- Output, Input, and Variables
- Variable Assignment and Calculations
- Variable Declarations and Data Types
- Named Constants
- Hand Tracing a Program
- Documenting a Program

- Designing Your First Program
- Focus on Languages: Java, Python, and C++
- Review Questions
- Debugging Exercises
- Programming Exercises

4: Modules

- Introduction to Modules
- Defining and Calling a Module
- Local Variables
- Passing Arguments to Modules
- Global Variables and Global Constants
- Focus on Languages: Java, Python, and C++
- Review Questions
- Debugging Exercises
- Programming Exercises

5: Decision Structures and Boolean Logic

- Introduction to Decision Structures
- Dual Alternative Decision Structures
- Comparing Strings
- Nested Decision Structures
- The Case Structure
- Logical Operators
- Boolean Variables
- Focus on Languages: Java, Python, and C++
- Review Questions
- Debugging Exercises
- Programming Exercises

6: Repetition Structures

- Introduction to Repetition Structures
- Condition-Controlled Loops: While, Do-While, and Do-Until
- Count-Controlled Loops and the For Statement
- Calculating a Running Total

- Sentinels
- Nested Loops
- Focus on Languages: Java, Python, and C++
- Review Questions
- Debugging Exercises
- Programming Exercises

7: Functions

- Introduction to Functions: Generating Random Numbers
- Writing Your Own Functions
- More Library Functions
- Focus on Languages: Java, Python, and C++
- Review Questions
- Debugging Exercises
- Programming Exercises

8: Input Validation

- Garbage In, Garbage Out

- The Input Validation Loop
- Defensive Programming
- Focus on Languages: Java, Python, and C++
- Review Questions
- Debugging Exercises
- Programming Exercises

9: Arrays

- Array Basics
- Sequentially Searching an Array
- Processing the Contents of an Array
- Parallel Arrays
- Two-Dimensional Arrays
- Arrays of Three or More Dimensions
- Focus on Languages: Java, Python, and C++
- Review Questions
- Debugging Exercises

- Programming Exercises

10: Sorting and Searching Arrays

- The Bubble Sort Algorithm
- The Selection Sort Algorithm
- The Insertion Sort Algorithm
- The Binary Search Algorithm
- Review Questions
- Debugging Exercise
- Programming Exercises

11: Files

- Introduction to File Input and Output
- Using Loops to Process Files
- Using Files and Arrays
- Processing Records
- Control Break Logic
- Focus on Languages: Java, Python, and C++

- Review Questions
- Debugging Exercises
- Programming Exercises

12: Menu-Driven Programs

- Introduction to Menu-Driven Programs
- Modularizing a Menu-Driven Program
- Using a Loop to Repeat the Menu
- Multiple-Level Menus
- Focus on Languages: Java, Python, and C++
- Review Questions

13: Text Processing

- Introduction
- Character-by-Character Text Processing
- Focus on Languages: Java, Python, and C++
- Review Questions
- Debugging Exercises

- Programming Exercises

14: Recursion

- Introduction to Recursion
- Problem Solving with Recursion
- Examples of Recursive Algorithms
- Focus on Languages: Java, Python, and C++
- Review Questions
- Programming Exercises

15: Object-Oriented Programming

- Procedural and Object-Oriented Programming
- Classes
- Using the Unified Modeling Language to Design Classes
- Finding the Classes and Their Responsibilities in a Problem
- Inheritance
- Polymorphism
- Focus on Languages: Java, Python, and C++

- Review Questions
- Programming Exercises

16: GUI Applications and Event-Driven Programming

- Graphical User Interfaces
- Designing the User Interface for a GUI Program
- Writing Event Handlers
- Designing Apps For Mobile Devices
- Focus on Languages: Java, Python, and C++
- Review Questions
- Programming Exercises

17: Appendix A: ASCII/Unicode Characters

18: Appendix B: Flowchart Symbols

19: Appendix C: Pseudocode Reference

20: Appendix D: Converting Decimal Numbers to Binary

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VIDEOS

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HOURS

12

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PRE-ASSESSMENTS QUESTIONS

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POST-ASSESSMENTS QUESTIONS

13 Live Labs

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Introduction to Computers and Programming

Input, Processing, and Output

- Creating a Flowchart for a Degree Program
- Creating a Pedometer Calculator
- Calculating Average

Modules

- Creating a Flowchart to Calculate Sales Tax
- Creating a Flowchart to Display Monthly Sales
- Using the if Statement
- Calculating the Retail Company's Tax Using Python
- Using the Python Conditional Statement
- Using Python Variables
- Using Python Functions

Decision Structures and Boolean Logic

- Creating a Flowchart to Display Store and Employee Bonuses
- Calculating the Total Meal Price Using the Python Operator
- Calculating the Retail Company's Bonus Using Python

Repetition Structures

- Creating a Flowchart Using Condition-Controlled Loops
- Creating a Flowchart to Print Seconds Using the Count-Controlled Loop
- Calculating Average Test Scores
- Using the for Statement

Functions

- Creating a Flowchart Using the RANDOM Function
- Solving Equations Using Python
- Creating a Dice Game

Input Validation

- Creating a Flowchart to Calculate the Average Test Score
- Calculating Call Over Minutes

Arrays

- Creating a Flowchart for the Blood Drive Program
- Calculating the Energy Savings Cost
- Creating the Blood Drive Program

Sorting and Searching Arrays

- Implementing Bubble Sort
- Implementing Selection Sort
- Implementing Insertion Sort
- Implementing Binary Sort

Files

Menu-Driven Programs

- Creating a Menu-Driven Program in Java

Text Processing

- Replacing Variables in C++

Recursion

- Creating a Recursive Function in Java

Object-Oriented Programming

- Creating an Object of the Class

GUI Applications and Event-Driven Programming

- Creating a German Translator

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LIVE LABS

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VIDEO TUTORIALS

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MINUTES

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