Java I - Programming Fundamentals

This is an introductory course in programming using Java and an IDE (such as VS Code or Eclipse). Students will gain foundational understanding of programming concepts including data types, variables, functions, conditionals, loops, data structures, and debugging techniques. Students will practice writing code with small exercises for each concept, and also complete more challenging exercises that combine multiple concepts. By the end of the course, students should understand fundamental programming concepts and will apply them to create a simple text-based adventure game.

Vocabulary Terms - Java I

Unit 1: Introduction - Data Types, Variables, Operators

- Video - How I would learn to code (If I could start over)
- What is Java?
    - Download and install Java SE Development Kit (JDK)
- What is an IDE? (Introduction to Eclipse/IntelliJ)
    - Download and install Eclipse/IntelliJ or VS Code
- Hello World
- Basic Java syntax
    - Comments
- Where to find assignments - Github repository
- Data types: integers, floats, strings, and booleans
- Variables: declaring, assigning, and reassigning
- Operators: assignment, arithmetic, logical, relational
- Input and output statements
- Basic string manipulation: slicing, concatenation, and formatting

Unit 2: Flow Control - Conditionals and Loops

- What is version control?
- Setting up a Github repository

- Functions: creating and calling functions, parameter passing, header, body, return
- What is flow control?
- Conditional statements: if, elif, and else statements
- Loops: for and while loops
- Arrays: creating, indexing, and slicing
    - Array methods: length(), sort(), binarySearch(), fill()
- Build a simple calculator

Unit 3: Best Practices and Advanced Topics

- Best practices - why do they matter?
- Code style and documentation
- Variable naming conventions and Java Code Conventions style guide
- Debugging techniques: using print statements and debugging tools
- Unit tests (JUnit)
- Exception handling: try-catch blocks
- File I/O: opening, reading, and writing to files
- Collections: creating and manipulating collections such as ArrayLists and HashMaps
- Text-based adventure game