

Outline for Java Boot Camp

This is the first week of the three week Java boot camp for IBM

Intro to Java

This introductory module Jqvae, how it came into being, the reasons for its development and the design approaches taken. Since this iss old programming languages, it can be confusing for students to understand why the code works the say it does.

This module covers:

- The language ecosystem architecture.
- The basics of writing and running a program in Java
- Basic workflow using and IDE.
- Basic program structure and design concepts
- Compiled code, intermediate code, write once run anywhere, interpreters

Language Basics

- Data types and variables
- Operators, statements and expressions
- Control structures: conditionals and loops
- Arrays and iterators
- Higher dimensional arrays
- Strings and encodings

Error Handling

- Exception approach to handling errors
- Try-Throw-Catch-Finally construct
- Throwing exceptions and Rethrowing exceptions
- Checked versus unchecked exceptions
- Try with resources

Packages

- Code modularization – motivation
- Code organization, coupling and cohesion
- Java packages
- Using packages
- Access control

Object Oriented Programming 1

- OOP principles, Iconicity and Recursive Design
- Class definitions and creating objects
- Encapsulation: instance variables and properties
- Methods and functions
- Access modifiers and data hiding.

Functions and Methods

- Defining methods
- Constructors
- Return values, arguments and method signatures
- Overloading methods
- Local variables and the 'this' variable

Object Oriented Programming 2

- Static methods and variables
- Inheritance
- Abstract classes and methods
- final and sealed keywords
- Overriding methods
- Polymorphism: up and down casting
- Constructors and inheritance

Interfaces

- The purpose and role of interfaces
- Defining interfaces
- Implementing interfaces
- Default and static methods in interfaces
- Properties in interfaces
- Using interfaces to simulate multiple inheritance
- Interface types for variables

Generics and Collections Basics

- Generics as type placeholders
- Data structures
 - Dynamic array list
 - Linked list
 - Hash table
 - Sorted dictionary
 - Set (unordered)
 - Set (ordered)
 - Queue
- Iterators and working with collection objects