

Java

Introduction of Java

- What is Java?
- How to Get Java
- A First Java Program
- Compiling and Interpreting Applications
- The JDK Directory Structure

Data types and Variables

- Primitive Datatypes ,Declarations
- Variable Names
- Numeric Literals,Character Literals
- String, String Literals
- Arrays, on-Primitive Datatypes, the Dot Operator

Operators and Expressions

- Expressions
- Assignment Operator
- Arithmetic Operators
- Relational Operators
- Logical Operators
- Increment and Decrement Operators
- Operate-Assign Operators (+=, etc.)
- The Conditional Operator
- Operator Precedence
- Implicit Type Conversions
- The Cast Operator

Control Flow Statements

- Statements
- Conditional (if) Statements
- Data types and Variables 3
- Adding an else if
- Conditional (switch) Statements
- While and do-while Loops
- for Loops
- A for Loop Diagram

Enhanced for Loop
The continue Statement
The break Statement

Methods

Methods
Calling Methods
Defining Methods
Method Parameters
Scope
Method Parameters
So, Why All the static?

Object-Oriented Programming

Introduction to Object-Oriented Programming
Classes and Objects
Fields and Methods
Encapsulation
Access Control
Inheritance
Polymorphism
Review -OOP as a programming style: manifestos -Encapsulation, Isolation, Abstraction
-Separating Interface and Implementation -constructors -destructors (lack of in Java) -
accessors and mutators (cloning issues on contained instances) -basic OOP design:
choosing class and method -Interfaces vs classes -Polymorphism and downcasting -more
examples

Objects and Classes

Defining a Class
Creating an Object
Instance Data and Class Data
Methods
Constructors
Access Modifiers
Encapsulation

Using Java Objects

Printing to the Console
Printf Format Strings
String Builder and String Buffer
Methods and Messages
toString

Parameter Passing
Comparing and Identifying Objects, Destroying Objects

Inheritance in Java

Inheritance
Inheritance in Java
Casting
Method Overriding
Polymorphism
super
The Object Class

Packages

The import Statement
Static Imports
Casting
CLASSPATH and Import
Defining Packages
Package Scope

Exception Handling

Exceptions Overview
Catching Exceptions
The finally Block
Exception Methods
Declaring Exceptions
Defining and Throwing Exceptions
Errors and Runtime Exceptions
Assertions

Input/Output Streams

Overview of Streams
Bytes vs. Characters
Converting Byte Streams to Character Streams
File Object
Binary Input and Output
PrintWriter Class
Reading and Writing Objects
Basic and Filtered

Collection Framework

The Collections Framework
The Set Interface
Set Implementation Classes
The List Interface
List Implementation Classes
The Map Interface
Map Implementation Classes

Inner Classes

Inner Classes
Member Classes
Local Classes
Anonymous Classes
Instance Initializers
Static Nested Classes

Introduction to Threads

Non-Threaded Applications
Threaded Applications
Creating Threads
Thread States
Runnable Threads
Coordinating Threads
Interrupting Threads
Runnable Interface, ThreadGroups

Interfaces and Abstract Classes

Separating Interface and Implementation
UML Interfaces and Realization
Defining Interfaces
Implementing and Extending Interfaces
Runnable Threads
Abstract Classes

Serialization

Object Serialization
Serializable Interface
Serialization API
ObjectInputStream and ObjectOutputStream
The Serialization Engine
Transient Fields
readObject and writeObject

Externalizable Interface

Generics

Using Generics

Type Erasure

Type Boundaries

Wildcards, Generic Methods

Strengths and Weaknesses of Generics

Legacy Code and Generics

Annotations

Uses for Meta-Data

The Annotations Model

Annotation Types and Annotations

Built-In Annotations

Annotations vs. Descriptors (XML)

Reflection

Uses for Meta-Data

The Reflection API, The Class Class

The java.lang.reflect Package

Reading Type Information

Navigating Inheritance Trees

Dynamic Instantiation, Dynamic Invocation

Reflecting on Generics

Error Handling

-Error handling strategies: return values vs exceptions -Basic Exception Handling -
try/catch/finally/throw -Debugging