

Java

Candidates for this exam are application developers working with Java 6 SE or later, secondary and immediate-post-secondary students of software development, or entry-level software developers.

Candidates should have at least 150 hours of instruction or hands-on experience with Java, be familiar with its features and capabilities, and understand how to write, debug and maintain well-formed, well-documented Java code.

To be successful on the test, the candidate is also expected to have the following prerequisite knowledge and skills:

- 8th grade reading skills
- Algebra II
- Basic computer operating system skills
- Command-line interface experience

1. Java Fundamentals

- 1.1 Describe the use of main in a Java application
 - Signature of main, how to consume an instance of your own class, command-line arguments
- 1.2 Perform basic input and output using standard packages
 - Print statements, import and use the Scanner class
- 1.3 Evaluate the scope of a variable
 - Declare a variable within a block, class, or method
- 1.4 Comment and document programs
 - Evaluate the syntax of Javadocs, write syntactically correct code comments

2. Data Types, Variables, and Expressions

- 2.1 Declare and use primitive data type variables
 - Data types, including byte, char, int, double, short, long, float, Boolean; identify when precision is lost; initialization; how primitives differ from wrapper object types such as Integer and Boolean
- 2.2 Construct and evaluate code that manipulates strings
 - String class and string literals, comparisons, concatenation, case, and length; String.format methods; string operators; the immutable nature of strings; initialization; null
- 2.3 Construct and evaluate code that creates, iterates, and manipulates arrays and array lists
 - One- and two-dimensional arrays, including initialization, null, size, iterating elements, accessing elements; array lists, including adding and removing elements, traversing the list
- 2.4 Construct and evaluate code that performs parsing, casting, and conversion
 - Cast between primitive data types, convert primitive types to equivalent object types, parse strings to numbers, convert primitive data types to strings

IT SPECIALIST EXAM OBJECTIVES

- 2.5 Construct and evaluate arithmetic expressions
- Arithmetic operators, assignment, compound assignment operators, operator precedence

3. Flow Control Implementation

- 3.1 Construct and evaluate code that uses branching statements
- if, else, else if, switch; single-line vs. block; nesting; logical and relational operators
- 3.2 Construct and evaluate code that uses loops
- while, for, for each, do while; break and continue; nesting; logical, relational, and unary operators

4. Object-Oriented Programming

- 4.1 Construct and evaluate class definitions
- Constructors, constructor overloading, one class per .java file, this keyword, basic inheritance and overriding
- 4.2 Declare, implement, and access data members in classes
- private, public, protected; instance data members; static data members; use static final to create constants; describe encapsulation
- 4.3 Declare, implement, and access methods
- private, public, protected; method parameters; return type; void; return value; instance methods; static methods; overloading
- 4.4 Instantiate and use class objects in programs
- Instantiation, initialization, null, access and modify data members, access methods, access and modify static members, import packages and classes

5. Code Compilation and Debugging

- 5.1 Troubleshoot syntax errors, logic errors, and runtime errors
- Print statements, javac command output, logic errors, console exceptions, stack trace evaluation
- 5.2 Implement exception handling
- try, catch, finally; Exception class; exception class types; display exception information



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