

Study guide for CS160 final exam

You should be able to interpret or write Java code that uses any of the items shown below. The study guide for the programming quiz is identical, except that we will not ask you questions on algorithms, searching or sorting.

- 1) Java Programs
 - a. Writing a **class** with a **main** method
 - b. Declaring, initializing, and assigning variables
 - c. Assignment statements
 - d. Numeric, character, and string literals
- 2) Data types
 - a. **int, double, boolean, char, String**
- 3) String functions
 - a. **length, charAt, indexOf**, concatenation (+)
 - b. **toUpperCase, toLowerCase**
 - c. **equals**, and know why `==` doesn't work!
- 4) Expressions
 - a. Primitive operators (`*`, `/`, `+`, `-`, `%`, `++`, `--`)
 - b. Order of operations, parentheses
 - c. Mixed types and type casting
- 5) Control Statements
 - a. **if, if-else**, and **else** statements
 - b. **switch** statements
 - c. **while, do while, for**
- 6) Write to the console
 - a. Using **System.out.print/println**
 - b. Combining literals and variables
 - c. Formatted output using **DecimalFormat**
- 7) Read from the console
 - a. Declaring and using a **Scanner** object
 - b. **nextLine, next, nextInt, nextDouble**
 - c. **hasNextLine, hasNext, hasNextInt, hasNextDouble**
- 8) Wrapper Classes
 - a. **Character.isLetter, Character.isDigit**
 - b. **Integer.parseInt, Double.parseDouble**
- 9) Arrays
 - a. Declaring, allocating, initializing arrays
 - b. Array indexing, array access, **length**
 - c. Arrays as method parameters and return values
 - d. 2-Dimensional arrays
- 10) File Input/Output
 - a. Creating and using **File** objects
 - b. Using a **Scanner** and to read a file
 - c. Using a **PrintWriter** to write a file
- 11) Exceptions
 - a. Using a **try/catch** block to handle exceptions
- 12) Methods
 - a. Defining and calling methods
 - b. Argument values and types
 - c. Return values and types, including **void**
 - d. Pass by reference vs. pass by value
- 13) Classes
 - a. **static** versus non-static data and methods
 - b. **public** versus **private** data and methods
 - c. Instantiating an **object** from a class, constructors
- 14) Algorithms
 - a. Algorithm Complexity
 - b. Searching an array (linear/binary search)
 - c. Sorting an array (bubble/insertion/selection sort)