

## Study guide for CS163/CS164 first midterm exam

By now, you should be able to interpret or write a Java program that uses any of the items shown below.

- 1) Java programs
  - a. Writing a **class** with **main** method
  - b. Importing packages
  - c. Declaring and initializing variables
  - d. Assignment statements
  - e. Numeric, character, and string literals
- 2) Data types (and size in bits)
  - a. **byte (8), short (16), int (32), long (64)**
  - b. **float (32), double (64)**
  - c. **boolean, char (16), String**
- 3) Expressions
  - a. Primitive operators: **\***, **/**, **+**, **-**, **%**, **++**, **--**
  - b. Integer versus floating point math
  - c. Relational operators: **==**, **!=**, **<**, **<=**, **>**, **>=**
  - d. Boolean operators: **&&**, **||**, **^**, **!**
  - e. Order of operations, parentheses
  - f. Mixed types and type casting
- 4) String functions
  - a. **length**, **charAt**, **indexOf**, **substring**
  - b. String concatenation: **concat**, **+**
  - c. String comparison: **equals** (**==** doesn't work!)
- 5) Writing to the console
  - a. Using **System.out.print/println/printf**
    - ✓ Differences between them
    - ✓ Formatters: **%f**, **%d**, **%c**, **%s**
    - ✓ Special Characters: **'\n'**, **'\t'**
  - b. Combining literals and variables
- 6) Reading from the console
  - a. Declaring and use a **Scanner**
  - b. Reading strings that are single tokens: **next**
  - c. Reading strings that are lines of text: **nextLine**
  - d. Reading integers and doubles: **nextInt**, **nextDouble**
- 7) Conditionals
  - a. **if**, **if-else**, and **else** statements
  - b. **switch** statements
- 8) Wrapper Classes
  - a. Integer: **parseInt()**
  - b. Double: **parseDouble()**
  - c. Character: **isUpperCase()**, **isDigit()**, **isLetter()**
- 9) Math
  - a. Math constants: **PI**
  - b. Math methods:
    - **sqrt()**
    - **sin()**, **cos()**
    - **pow()**, **exp()**, **log()**
    - **min()**, **max()**
    - **round()**, **floor()**, **ceil()**
- 10) Control Loops
  - a. **for** loops
  - b. **while** loops
  - c. **do/while** loops
  - d. **for each** loops
  - e. **break** keyword
  - f. **continue** keyword