

## Items to study for COMP 170 Exam 1, November 26 –

### Chapters 1 - 4

Java constants and literal values like 2, 3.14159, and "abc"; also Java variables of various types

- Java numeric assignment statements and expressions using operators like +, -, \*, /, and %
  - Be able to distinguish between integer division and decimal division
  - Remember that a%b means the modulus or remainder after dividing a by b
  - Remember that \*, /, and % are done before + and - unless there are parentheses
  - Remember about automatic conversions, for example from char to int, int to double, ...
- The difference between System.out.print and System.out.println, and how to use each of them
  - How to print a blank line using System.out.println: System.out.println();
  - What is printed for each data type; in particular, chars print their character value if you print them with System.out.print/println, just as though they were string values
- Strings, string indexing, string methods like length, substring, indexOf, ...
  - String assignments and using + with strings (and “adding” strings to other types)
  - What are valid indexes – where do they start and stop? [start at 0, go to length - 1]
  - The two different versions of substring and what they mean (1 parameter vs. 2)
  - Escape characters used with Strings (and chars): \n, \t, \", \', \\, ...
- If and else statements, if logical conditions, and which statements are controlled by each
  - Using curly braces to delimit the statements under control of an if/else if/else
  - Use of *else if* – what it means and how it goes together with other parts of an if
  - Nesting of if statements inside each other (and also nesting inside / around loops)
- While, for, and do-while loops and the conditional/logical expressions that they depend on
  - Understand how many times a while/for/do-while loop executes based on its condition
  - Understand what happens inside the “body” of a loop vs. before or after it executes
  - Possibly for-each loops – may be useful, but not required
- For boolean expressions in general, know how to use relational operators like ==, <, >=, etc, and how to use logical operators like && and ||
  - Remember that && and || are done after all other numeric and relational operators unless there are parentheses
  - Remember that && and || “short-circuit” and understand what that means
- Reading keyboard input using Scanner
  - The requirement for import java.util.Scanner; (or java.util.\*;) at the top of your program
  - The need to create a Scanner object before reading input:  
Scanner keyboard = new Scanner(System.in);
  - The various methods you can use with a Scanner object:
    - nextInt, nextDouble, nextBoolean, ... → read and return values of those types
    - next → read a single “word”, delimited by whitespace (space, tab, Enter, ...), and return it as a String
    - nextLine → read the rest of the line up to Enter and return it as a String, but without the ending newline character that Enter sends in

**From Chapters 5 and 6: Classes and objects study items Instance variables and how they are accessed (read and written)**

- **Constructors and what they do, including their parameters (but no return types!) Multiple constructors**
- **Instance methods and how they are accessed (with an object reference and a dot .)**
  - **How to code standard “getter” and “setter” methods for instance variables**
- **The use of “this” in referencing an object variable.**

**You may create and reference two 8.5x11 inch single-sided pages of notes (or one double-sided page) for use during the Exam, typed or hand-written, but you may not use your computer. The exam is paper-based.**