

CSC152 – Spring 2009

Midterm review topics (**Midterm date: 03.19.09**)

- Arithmetic operators: - + / * %
Make sure you understand % and you can identify integer division
- Relational operators: > < <= >= != ==
- Increment and decrement operators: ++, --
- Shorthand (compound operators): +=, -=, *=, /=, and %=
- Numeric data types (int, long, float, double)
Ranges, precision, and variable declarations
- println statement using a combination of string literals, numerical values and variables:
int x = 3, y = 5;
System.out.println("here they are: " + x + y);
System.out.println("here they are: " + (x + y));
- Implicit type conversion with expressions of mixed types:
double x = 1 / 3.0; // x will be 0.3333
double x = 1 / 3 * 1.54; // x will be 0.0
- Explicit type conversion (type casting). Examples:
int sum = (int) (1.2 + 1.8); // sum will be 3
int sum = (int) 1.2 + 1.8; // error because (int) has higher precedence than +.
System.out.println((int) 'a'); // convert the 'a' to its integer representation
- Obtaining input from the user: create a Scanner object and invoke its methods (nextInt, nextDouble)
- Creating a Board object, understanding board coordinates, and invoking its methods
- Invoking methods of the Math class (e.g. Math.pow(2,3))
- The notion of arguments/parameters and return values
Understand that the return value of a method may either be saved to a variable or printed out (not saved). Examples:
double result = Math.sqrt(5); // answer is saved in 'result'
System.out.println(Math.sqrt(5)); // sqrt is computed and answer is only printed out
- Arguments to a method as expressions: double results = Math.pow(5%3, 5.2/6);
- RGB color concepts (primary color components and their intensity values)
- Creating a color object and using it to fill a board cell
- The while loop: what are its essential elements? How can I get a set of statements to repeat a given number of times? When does a loop execute infinitely? Examples? When does the body of a loop not execute?
- Given a code segment with a while loop, can I step through its execution and understand how the values of its variables change with every iteration (refer to quiz for examples)?
- Given a problem, can I recognize which operations are repeated and what the stopping condition is? Examples: summing a series of numbers, prompting the user for input repeatedly until a condition occurs, interest computation.
- The do-while loop: how is it different from the while loop. Can I think of an example where it's better to use a do-while loop?
- The for loop: its structure and how its equivalence to a while loop. Can I express a problem of repetition using a for loop? How about loops with multiple variable declarations and updates: e.g. for (int i = 9; j = 5; i >= 0; i--, j++)
- Variable scope: what is the scope of a variable? What does it mean? Can I access a variable declared in the for loop outside the loop?
- Random number generation: how to create an object of the Random class and invoke its method nextInt to obtain a random integer. How can I obtain a random integer within a range? Examples: simulating the roll of a die.
- The char type and its numeric representation (the ASCII code). How can I use a Random object to generate random characters?