

COSC 201 Prep Topics  
Updated: Summer 2013

Here's what I expect students should be comfortable with before starting in 201. I've included at least one sample question for each. Note: I encourage you to seek out answers on your own!

0.) User input and output.

Q0: Get an integer from the user and print it with some sort of informative message. For instance, if the user inputs 4, the output should be "The user input the integer 4".

1.) Declaring variables of various types, both primitive (like int) and reference (like ArrayList).

Q1: Declare a variable of the following types: int, float, String, an ArrayList of Integers.

2.) Basic arithmetic and Boolean operations.

Q2a: Be able to adequately describe the following operations: +, -, \*, /, ++, --, %. What is the result of  $14\%3$ ?

Q2b: Be able to construct the truth table for the following operations: &&, ||, !, ^.

3.) Declaring and using Arrays and ArrayLists.

Q3a: Create an ArrayList of Strings and initialize it with 5 strings (your choice).

Q3b: Create an Array of ints and initialize it with 10 ints. Print that list, with each element on its own line.

4.) Use branching control structures.

Q4a: Using an if statement, determine the smallest of three integers a, b, and c.

Q4b: Create a short snippet of code that gets two integers (a and b) from the user, as well as a char (choice) that represents the operation to be done on the two integers. The valid options are +, -, \*, /. Using a switch, output the result of applying the operation to the two integers. If the char inputted by the user is not one of the four operators, it should output a helpful error message.

5.) Use looping control structures.

Q5a: Create a for loop that will print out the numbers 0 through 9 using a for loop.

Q5b: Create a while loop that does the same thing as 5a.

Q5c: Create an ArrayList of Integers and add 5 integers to that ArrayList. Using an enhanced for loop (also known as a for-each loop) print each of elements in the ArrayList.

6.) Use the main method.

Q6: Create a simple main method that gets a number from the user, squares it, then outputs the answer.

7.) Creation and use of methods/functions.

Q7a: Create a function that will take in three integer values and return the sum of those values. No user input is allowed in the function. In the main method, call that function with three integers of your choosing and output the returned value. Don't cheat by having the function be static!

Q7b: Create a function that prompts the user for 10 integers, puts them in an array and returns that created array.

8.) Creating classes and objects.

Q8: Create a class Student, with three fields: id, name, gpa. Create mutators and accessors (set and get functions), two constructors, and a toString method. In main, instantiate Student and use the toString method to print the Student.

9.) Using the Random class.

Q9: In main, create an instance of Java's Random class and use it to print 10 random integers from 1 to 100.

10.) Using file input/output.

Q10: In main, pull in the Strings from a file temp.txt, store them in an ArrayList and print them out.

11.) Implementing recursive functions.

Q11: Create a recursive function that returns the sum of the numbers from 1 to n, where n is an integer passed in to the function.