CSci 111 - Computer Science I
Test 1 Example Questions

Bring a #16485 scantron and a #2 pencil. I will provide any additional paper that you will need.

The test will cover Chapters 1 through 3.

However, note that the material covered by sections 2.14, 3.8, and 3.10 will not be on the test. We will cover these sections, but they will be tested on Test 2.

Note that the following are example questions. They may or may not be used on the exam. Since I am using them here, most likely they will not be used, but rather similar questions will be developed.

The java compiler generates _______ code? (byte)

What is an algorithm? (The sequence of steps that are followed to accomplish a specific task.)

Which tool is used to compile a Java program? (javac)

Give an example of a Java reserved word. ‘class’ or ‘static’ are example reserved words. A reserved word is also called a keyword.

How is a Java reserved word different from any other program identifier? It has special meaning to the compiler.

Give an example of a Java primitive data type. int, double, ...

List the primitive data types that can be used to represent whole numbers. byte, short, int, long.

How is a primitive data type variable different from an reference variable? A primitive variable contains the data directly in the memory cell, while a reference variable holds a ‘link’ (i.e. reference) to an object.
Is the operator ‘<’ a relational, assignment, arithmetic or logical operator?
Relational

Is the operator ‘=’ a relational, assignment, arithmetic or logical operator?
Assignment

Is the operator ‘&&’ a relational, assignment, arithmetic or logical operator?
Logical

There are many methodologies for developing software. For a Chapter 1-2 type cs111 program, we used the steps of **Analysis** and **Design** to start the development process. These are performed in no particular order. Describe each one.

**Analysis:**

Identify the input(s) and output(s) of the problem and the data types needed for each one.

Also, determine any formulas that might be needed and how they would be coded in Java.

Develop the Test Data Set for the problem.

**Design:** Develop the algorithm for the solution.

What step of program development follows the Analysis & Design ‘phase’? The coding and debugging part. (i.e. **implementation**)

Once the program compiles and runs, it must be _____________ to ensure that it works properly. (answer: tested)

What is the difference between syntax and semantics? Syntax specifies the form that a program element, such as a statement, must take which semantics describes the meaning of the program element such as how the statement “works”. Think back to the example from class using the assignment statement for this...

A missing closing brace is an example of a _____ error. (syntax)

Incorrect or missing output is an example of a _____ error. (logic)
A division by zero exception is an example of a ________ error. (run-time)

List the Java primitive data types that can be used to represent floating-point numbers in order from least inclusive to most inclusive and give an example of usage. (float, double)

double average = 95.2;

List the Java primitive data type that is used to represent a single character and give an example of usage.

char initial = 'A';

Is the Java identifier ‘1stScore’ syntactically valid? (no)

Describe the *naming conventions* for program constants. (All uppercase using underscores for word separations. Example: MAX_SCORE)

What is the value of variable x after each statement, assuming that the variables a, b and c are all int variables and hold the values of 3, 5, and 2.

1. int x = a + b * c; // 13
2. int x = (a + b) * c; // 16
3. int x = b / c; // 2
4. int x = b % c; // 1
5. double x = b / c; // 2.0
6. double x = (double) (b/c); // 2.0
7. double x = (double) b / c; // 2.5

What is the value of variable z after each statement, assuming that the variables a, b and c are all int variables and hold the values of 3, 5, and 2.

1. 
   if(a < b)
   z = 9;
   else
   z = 0;
2. 
   if (a == c)
   z = a * b;
   else
3. 
\[ z = 10; \]
\[ \text{if (a < b || b < c)} \]
\[ \quad z = 100; \]

4. 
\[ z = 0; \]
\[ \text{if (a < b && b < c)} \]
\[ \quad z = 20; \]

Describe when integer arithmetic is used in Java and when floating point arithmetic is used in Java. If both operands are integer types, then integer arithmetic is used else floating point arithmetic is used.

Explain why using integer arithmetic can yield unexpected results. Integer division truncates the fractional part of the result.

Explain the three ways to solve the integer arithmetic problem in Java, including the use of a cast. Apply a cast of double to at least one of the operands or declare at least one of the operands to be a floating point type or add a decimal point if the operand is an integer literal.

Explain the difference between using the "==" operator and using ".equals method" to compare two Strings. ‘==’ compares the references to the Strings while .equals compares the actual values of the Strings.

Write a Java code segment to declare and initialize a constant to hold the tax rate of 5%.

```java
final double TAX_RATE = .05;
```

Declare a variable that will be used to contain the name of a person.

```java
String name;
```

Which Scanner class method is used to read a String? Either `next()` or `nextLine()`
What is output by the following code segment:

String name = "Hal";

System.out.println(name.charAt(0)); // prints H

System.out.println(Math.pow(3,2)); // prints 9

Other good examples come from the Review, Predict the Output and Find the Error on pages 100-103; Algorithm Problems 1-4 and 6-13 on pages 103-104; Short Answer Problems 1-12 on pages 104-105.

Review Problems 1-12, 14, on pages 182-183; Find the error problems 1-7 on pages 184-185; Algorithm problems 1-10 on pages 185-187; Short answer problems 1-9 on page 187.