COSC-1436, Lab Assignment 2

For this Lab Assignment, and for many of the remaining Lab Assignments, you will create and submit **two** (2) files. The first file will be a word processing document that is compatible with Microsoft Word. This file will contain your full name, the name of the assignment, and your answers to several questions. The second file will be the C++ source code file that includes a comment statement containing your full name along with your solution to the Programming Exercise portion of each Lab Assignment.

> **NOTE:** If you are not sure where the source code file containing your solution is stored on your computer, refer to the document named "*Finding Your Source Code*" located in the "*Start Here*" content area of the Brightspace course.

Answer the following questions in a word processing document that is compatible with Microsoft Word. Include your full name and the name of the assignment at the top of the document. Name the file "**XYLab2.docx**", where "**X**" and "**Y**" are your first and last initials. For example, when a student whose name is Everett T. Banks uses Microsoft Word, they will name the file they submit as "**EBLab2.docx**".

Questions (50 points):

1. Compose a single C++ programming statement that will display your full name on the screen in the form *`last name, first name`*. For example, when Joseph Shell answers this question, his code will display "*`Shell, Joseph.`*"

   (Hint: The `cout` object displays information on the screen.)

2. Indicate whether each of the following items is either a legal C++ identifier, a C++ keyword, or an invalid identifier:

   a) `1st_Prize`
   b) `friend`
   c) `sales tax rate`
   d) `InterestRate`
   e) `_zantz`
   f) `enemy`
   g) `veryLongFolderName_for_FY_2023`
   h) `static`
   i) `BROLE`
   j) `sub_way`

3. Compose the C++ programming statements that are required to do the following:

a) declare a `double` variable named `voltage` with an initial value of 123.45.
b) declare an integer (`int`) variable named `number` with value of 12.
c) create a C++ assignment statement that will assign the value of `voltage` divided by `number` to a `double` variable named `averageVoltage`.

4. What is the value of the variable named `quantity` after the following C++ code snippet is executed?

```
int quantity = 15;
quantity = 12.5;
```

5. Create a single C++ programming statement that declares a variable whose name is `ANSWER` to be a named constant with an integer (`int`) data type and an initial value of 42.

Programming Exercise (50 points):

Student ID Number Program

Create a C++ program that does the following:

1. Declare an integer (`int`) variable named `number` and initialize it to the value of your 7-digit student ID number.
2. Declare an integer (`int`) variable named `left` and initialize it to the four left-most digits in your student ID number.
   (For example, if your ID number was 1234567, you would initialize the variable named `left` to the value 1234.)
3. Declare an integer (`int`) variable named `right` and initialize it to the three right-most digits in your student ID number.
   (For example, if your ID number was 1234567, you would initialize the variable named `right` to the value 567. Do not include leading zeroes.)
4. Declare an integer (`int`) variable named `total` and assign to it the sum of the values stored in the variables named `left` and `right`.
   (`left` plus `right`)
5. Declare an integer (`int`) variable named `difference` and assign to it the value of the variable named `right` subtracted from the value stored in the variable named `left`.
   (`left` minus `right`)

6. Declare an integer (`int`) variable named `product` and assign to it the value of the variable named `left` times the value of the variable named `right`.
   (`left` times `right`)
7. Declare an integer (`int`) variable named `division` and assign to it the value of the variable named `left` divided by the value of the variable named `right`.
   (`left` divided by `right`)
8. Declare an integer (`int`) variable named `leftover` and assign to it the value of the variable named `left` modulus the value of the variable named `right`.
   (`left` modulus `right`)
9. Declare a `double` variable named `upper` and assign it the value of the variable named `left`.
10. Declare a `double` variable named `lower` and assign to it the value of the variable named `right`.
11. Declare a `double` variable named `ratio` and assign to it the value of the variable named `upper` divided by the value of the variable named `lower`.
    (`upper` divided by `lower`)
12. Create the C++ programming statements that are necessary to display the names and values of ***all*** the variables you created in this program. Display each variable name and its value on a separate line. For example:

```
cout << "number = " << number << endl;
```

Note: Numeric values that begin with a zero (0) are treated as octal (base 8) values in C++. For example, the numeric literal 011 will be interpreted as the octal representation of the decimal value 9. If the three least significant digits in your 7-digit student ID number begin with a zero (0), omit any leading zeros before assigning that numeric literal to the integer variable named `right`.

Submit two files: the C++ source code file (`.cpp`) you created along with the word processing file that contains your answers to the Questions above.

You must solve this problem using only the material that has been presented so far in the course. At this point, we have covered Chapters 1 through 2.

NOTE: Remember to submit **both** files; the word processing file that contains your answers to the questions above *and* the source code file that contains your solution to the programming exercise.

