CSCI 201 – Computer Science 1

Lab Assignment 1. *Note: There is no pre-lab section for this assignment.*
Due date: Friday, January 12.

Note: *These are some videos that are linked to the course introduction handout, and also posted on D2L. Please watch them before attemting this assignment.*
Remote access to Unix. To see a video explaining how to access the server remotely through a laptop click here. This next video explains how you can use Notepad++ on your PC, as an editor for creating files in Unix.
Access in the closed lab. Those who are physically in the lab can bring a laptop or access the server through the thin clients provided in the lab. This video explains how to use the thin clients in the lab to access Unix, create and edit files, etc.

Objective. This lab introduces creating, editing, compiling, and executing C++ program files on the UNIX machine, referred to as **centos**. You will learn about the basic unix commands and the command line environment. You will explore error messages in the C++ compiler, and learn to use `sftp` to submit the assignment.

Carry out the operations described below.

Reaching centos and Logging On. See the videos on D2L that explain how you can connect with the Unix VM, open an editor etc.

Creating a Subdirectory. Create a subdirectory (folder) from the command line using the command `mkdir Assignment01` (`mkdir` is an abbreviation for "make directory").
Navigating to a subdirectory. The command `cd Assignment01` (`cd` is an abbreviation for "change directory") will get you into the new folder. To go back up to the parent folder, use the command `cd ..` (the letters "cd" followed by a space, and two periods; the two periods denote the parent directory or the directory within which the current directory is contained).
Watch the videos in D2L; they also explain how to create files remotely using Notepad++, and how to create files in the lab using gedit.

Enter the following text into the file.

```
// < your name >
// CSCI 201: Lab assignment 1
#include <cstdlib>
#include <iostream>
#include <iomanip>
using namespace std;
const double PI = 3.14159265;
int main ()
{
    double radius, volume;
    cout << "Enter the radius of a sphere: ";
    cin >> radius;
```

```
    volume = 4.0/3.0 * PI * radius * radius * radius;
    cout << "The spheres volume is: " << volume << endl;
    return 0;
}
```

To save the file, click File, then Save. You can close the editor by choosing File, then Quit.

Compiling and Running the Program. Go back to the terminal window. The command `ls` (`ls` is an abbreviation for "list") at the command prompt should show you a list of names that includes `Lab01.cpp`.

Compile the program with the command `g++ Lab01.cpp`. If you get error messages, examine them carefully, especially the first one, and modify your program (using the command `gedit Lab01.cpp`) to fix them. After fixing all errors (successful compilation), another `ls` in the terminal window should now also show you a file named `a.out`. To run the successfully compiled program, use this command in the terminal window: `./a.out`. (Dont forget the "dot slash" before "a.out".)

What to turn in: Carry out the following steps:
1. Start a script session by typing the command `script Labscript1.txt`. This will record a transcript of all subsequent activities in the file `Labscript1.txt`.
2. Display the program with the command `cat Lab1.cpp`
3. Compile the program in the file `Lab1.cpp`. Edit the program to correct errors, if needed.
4. Run the compiled program and show a few tests.
5. **Exploring error messages.** Make the following changes to the code. Using an editor, create a text document, `Answers.txt`, to type the answers to the questions.

(a) Remove the semicolon at the end of the statement:
`cout << "Enter the radius of a sphere: ";`
Save the file and compile the program. Which line of the program did you make the change? What does the error message say (exact text)?Correct the error.

(b) Remove the semicolon at the end of the statement:
`double radius, volume;`
Save the file and compile the program. Which line of the program did you make the change? What does the error message say (exact text)? Are the line numbers the same? Correct the error.

(c) Comment out the statement:
`#include <iostream>`
Save the file and compile the program. Which line of the program did you make the change? What does the error message say (exact text)? Are the line numbers the same? Correct the error.

(d) Mis-spell "volume" in the declaration as "volme":
`double radius, volme;`
Save the file and compile the program. Which line of the program did you make the change? What does the error message say (exact text)? Are the line numbers the same? Correct the error.

6. Terminate the script session by the `exit` command.

How to submit assignments into `CourseFiles`

The `CourseFiles` folder is mapped to the `Y:` drive on the windows machines on campus. To access this though the Unix system, do the following (this video will be helpful to understand what is happening; this video explains how this can be done on the thin clients in the lab):

1. Start in the folder in which you have the files you want to submit; for this lab you should be in the folder `Assignment01`. (To verify this give the `ls` command to see the files.)
2. Type in the command `sftp sftp.stcloudstate.edu`. Enter the password at the prompt. You will see a prompt that says ``sftp'' (`sftp` stands for secure file-transfer protocol, and is a secure version of File Transfer Protocol (FTP), which facilitates data access and data transfer over a Secure Shell (SSH) data stream.)
3. The command `cd CourseFiles` gets you into the `Y:` drive.
4. The command `cd Spring2023` followed by `cd sarnath` gets you to my folder. In that, use the `cd` command to get to the `CSCI201...` folder.
5. The `ls` command will show a `StudentWorkFolder`. Go into that (using `cd` command), and give the `ls` command. You should see a folder with your starid. That is your submission folder; go into that folder (again, using `cd`).
6. Create another folder with the name "Lab1" (`mkdir Lab1`). Go into the Lab1 folder (use "cd") and upload your files there. This will be done by the commands
   `put Lab01.cpp`
   `put Labscript1.txt`
   If you do an "ls", you should see the files in there. The `Answers.txt` should also be uploaded to the same folder.
7. The `exit` command will get you back to the folder where you started.

Dont forget to logout when you are all done. This can be done through the menu (bottom left) in the lab; on your PC, type in "logout" and close that window.