CS 150 Lab 2

Introduction Variables, Assignments and Output

The purpose of today's lab session is to allow you to gain experience using primitive data types, constants, assignment statements and output statements. Each activity today will consist of a small number of computations and a set of output to display the results.

Lab 2.1: Opening and fixing C++ programs

For this next problem, you will be opening some existing programs and running them in Visual Studio. These programs contain errors that you will need to identify and fix.

Lab 2.1.a: Syntax errors

Opening a project:

The following instructions are for opening an existing C++ project. This could be one that I give you or one that you have created.

1) You will need to copy the projects to the desktop before opening them in Visual Studio. Go to the 'CS150-01 Public' folder on Turing. You will find the folder '01CompileError' in the '02Lab' folder. Copy the folder '01CompileError' to the desktop.

2) To open your project, start up Visual Studio 3. Click on 'File' from the menu, then 'Open' and 'Project/Solution'.

3) Click on the drop down box and select 'Desktop'. Double click on the folder '01CompileError'.

You will see a list of files.

4) Select the Microsoft Visual Studio Solution file called '01CompileError'. It's the one with this icon.

Click 'Open'.

This will open the project.

Build the program. It will give you an error, which is an example of a syntax error. You are likely to encounter many of these errors as you progress through the course, and it's important for you to learn to recognize them.

Try to find the error and fix it. Note that the line number given to you by the compiler could be misleading.

Once you have fixed the error and your program builds, run the program and input the number 9. Write down the output, and run the program again with another number.

Q. Do you feel that you are getting valid output?
A. _____

_____

_____

_____

5) Show your solution to the TA or instructor.

Lab 2.1.b Run-Time Errors

6) Copy the '02RunTimeError' project located in the 'CS150-01 Public' folder under 'Lab Projects' to your folder on Turing, then open it as you did in the previous example.

7) Try and build the program and run it.

Q. Input any number into the program. What is the result? Is this the result that you expected?
A. _____

_____

_____

_____

The problem here is that we are asking the computer to break the laws of Math by dividing by zero. It cannot be done, so the compiler outputs a nonsense answer.

8) Fix the problem, then show it to the instructor or the TA.

Lab 2.2

For this lab you will receive a partially written solution and will need to implement the missing parts of the code as described by the comments. When the program is built, it will calculate the area and circumference of a circle and print these values to the screen. Be sure to read the comments in the source code carefully when implementing this lab.

To retrieve the partially written solution, do the following:

1) You will need to copy the projects to your folder before opening them in Visual Studio. Go to the 'CS150-01 Public' folder on Turing. You will find the folder '03Circle' in the '02Lab' folder. Copy the folder '03Circle' to the desktop.

2) Rename the folder on your Desktop from '03Circle' to '03CircleXXXXXXXX' where the XXXXXXXX is your PUNet ID.

3) To open your project, start up Visual Studio like you did last week. Click on 'File' from the menu, then 'Open' and 'Project/Solution'.

4) Click on the drop down box and select 'Desktop'. Double click on the folder '03CircleXXXXXXXX'

You will see a list of files.

5) Select the Microsoft Visual Studio Solution file called '03Circle'. It's the one with this icon.

Click 'Open'.

This will open the project. Complete the project.

Submitting your finished project:

Once you have completed your lab projects, you will need to submit them for grading. You will submit your projects to the 'CS150-01Lab' folder on Turing. You may only submit your projects once, so make sure that they are in their final form. Also, make sure that you submit the correct project. Be sure to close Visual Studio before copying and moving your folder.

To submit the project, copy (do not move) the folder you created on the Desktop, '02CircleXXXXXXX', to the directory Turing\Students\CS150-01 Lab.

To save a copy of your project for yourself, move the folder you created on the Desktop to Turing\Students\XXXXXXXX, where XXXXXXXX is your PUNet ID.

Lab 2.3

For this lab you will create a new Visual Studio Project that will contain your source code. Name this project "04rectanglexxxxxxxx", replacing xxxxxxxx with your PUNet Id.

The goal of this program is to calculate the area and perimeter of a rectangle and then display both of these values on the screen. When displaying each value to the screen, display the formula used to calculate that value as well. You may use the previous

program as a guide. The length and width of the rectangle may be given as constants (Length=8 and Width=3).

Continue to work until your program produces the correct output. The area of the rectangle is 24 and the perimeter is 22.

Be sure to add comments to your code to detail how each variable is used and the purpose of each calculation.

Once you have completed this program, submit it to Turing just like you did with the circle example.

Optional Challenge:

Once you have followed all of the above instructions and submitted your lab projects, modify your project so that it displays a message asking for the length of the rectangle. Once the user types in the length of the rectangle your program should ask for the width of the rectangle. After successfully reading in the length and width of the rectangle, the program should calculate and display the area and perimeter as described above.

Instead of removing or changing lines from your source file, comment out each line you wish to change or remove so that your file will contain the source code to solve the assignment from Lab 2.3 as well as the Challenge.

Remember, to turn a line into a comment, place double forward slashes, // at the beginning of the line like this:

`// return 0;`