Lab Purpose

Practice creating C++ from creating a program plan (algorithm) to entering the program instructions, declaring variables, getting input from the user and displaying output in the console window as well as running and debugging it.

Always bring to class

1. Gaddis' book, How-to handouts from Canvas and your class notes.
2. This assignment sheet & the grade sheet for this lab already printed out.
3. USB Flash drive(s) or other storage media.

Mandatory Instructions

You're ordering pizza for a party and need a program to calculate the number of slices a pizza of any size can be divided into. Write a complete C++ program that will:

A) Ask you for the diameter of the pizza in inches.
B) Calculate the number of slices that can be taken from a pizza of that size.
C) Display a message telling the diameter and area of the pizza and the number of slices.

To calculate the number of slices that may be taken from the pizza, you need the following facts:

- Each slice should have an area of 14.125 inches.
- To calculate the number of slices, simply divide the area of the pizza by 14.125.
- The area of the pizza is calculated with this formula: Area = πr^2

Note: π is the Greek letter pi. 3.14159 can be used as its value. The value r is the radius of the pizza. Divide the diameter by 2 to get the radius. Use this information to fill in the table below calculating answers with your calculator:

Diameter of pizza: 15 inches **Area of pizza**: _____ **Number of slices**: _____
Diameter of pizza: 17 inches **Area of pizza**: _____ **Number of slices**: _____

```
What is the diameter of pizza you wish to order? 15

Area of pizza is 176.714
There are 12 slices in one pizza!

Press any key to continue . . .
```

```
What is the diameter of pizza you wish to order? 17

Area of pizza is 226.980
There are 16 slices in one pizza!

Press any key to continue . . .
```

1. Write the algorithm – the list of steps needed to solve the problem. No C++ statements please! Use words like Get, Calculate, Display. (More room on the back if you need it.)

2. Write the C++ statements for the constant and variable declarations, choosing a name and data type for each one. Then write the C++ statements for the steps listed in step 1. Think about what C++ statement can be used for each step and carefully check the format and punctuation for each one.

3. Type program on the computer – Create a new C++ project folder in Visual Studio using your last names and Lab4 (e.g., MortonL_Lab4). Add a .cpp file to the project. Put your name, class time and today's date in comments at the very beginning of the code. Add inline comments and the code in the main function.

4. Debug program – Correct any errors found in your code.

5. Test program –Run your program several times with different pizza diameters including the value above. Compare the output to your calculated results. Are they the same?

6. If you plan to go on and do the Bonus, wait and turn in your project after finishing that part. Otherwise, turn in your program electronically on CS Classes now.

Optional Instructions, i.e., BONUS

Now that you know how many slices per pizza, you want to figure out how many pizzas to order. Make the modifications described below to your algorithm and your program to calculate this. Consider additional constants, inputs and outputs and calculations you will need. DO NOT CREATE ANOTHER PROJECT.

1. Ask for the number of people who will be at the party as well as the diameter of the pizzas to be ordered (assume all pizzas will be the same diameter).
2. Calculate and display the number of pizzas you need to order for your party if each person attending is expected to eat an average of four slices.
3. Turn in your program solution folder electronically via Canvas.
4. You cannot order less than one whole pizza.
5. Below see an example of the program running with input: 15" pizza and 8 people and 17" pizzas with 8 people.

```
What is the diameter of pizza you wish to order? 15
How many people in your party? 8

Area of pizza is 176.714
There are 12 slices in one pizza!
You need total of 32 slices of pizza.
You should order 3 of the 15" pizzas

Press any key to continue . . .
```

```
What is the diameter of pizza you wish to order? 17
How many people in your party? 8

Area of pizza is 226.980
There are 16 slices in one pizza!
You need total of 32 slices of pizza.
You should order 2 of the 17" pizzas

Press any key to continue . . .
```

What to turn in?

1. Locate the project folder (i.e., your program solution) on your USB Flash drive. Right-click on the folder and select "**Send to -> Compressed (zipped) folder**". A new compressed folder will be created.
2. Logon to Canvas & Locate Lab assignment (Assignment tab or Module of the week)
3. Click on the ***Submit Solution*** button located in the upper right corner of Canvas page
4. Click ***Choose File*** and select the compressed solution from step 1 -- make sure you upload the zip file, no other file extensions will be accepted by Canvas
5. Press ***Submit Assignment***
6. You're done. Log out of Canvas and if you signed the attendance sheet you can leave.