Description:

```
///Programmer_info
 cout<<"*********************************\n"
     <<"*      Lab Assignement 2        *\n"
     <<"* CS150 ODU Computer Science    *\n"
     <<"* Author: ??????               *\n"
     <<"* Date: ????????               *\n"
     <<"* TA Name: ????????            *\n"
     <<"* TA Email: ????????           *\n"
     <<"*********************************\n";
```

Part A. Description:

We will build a program that prompts the user for input values, calculates several values, and displays them to the screen. We will study basic I/O operations (cout , cin), arithmetic expressions (Mathematical expressions), and formatting output. Calculations will use the following formulae:

- $Cube\ area = 6 \times length^2$
- $Cube\ volume = length^3$
- $Circle\ area = \pi \times radius^2$
- $Circle\ circumference = 2 \times \pi \times radius$
- $Rectangle\ area = length \times width$
- $Rectangle\ perimeter = 2 \times (length + width)$

Instructions:

Preliminary Instructions :

1. Read this document completely before you begin work.

2. Read and run the template source code file (lab02_2016_F_LName.cpp) and look for comments that are the hints to solve the problem.

3. Refer to the sample output (page 2).

4. Update the preliminary comments at the top of the template file with your information. Then fill out the programmer information inside the main function to print on the console. Your Programmer Output should look the graphic at the top of this document, … but with your information filled in. This information is required on all lab assignments this semester. Save your source code file as **lab02_2016_F_LName.cpp**, replacing F and LName with your name before you submit it on Blackboard – or you will lose points on the lab.

5. Prompt the user for length of a cube.

6. Prompt the user for circle radius.

7. Prompt the user for rectangle length.

8. Prompt the user for rectangle width.

9. Write the code for calculating the area of the cube using formulas provided in the prompt.

10. Write the code for calculating the area and circumference of the circle using formulas provided in the prompt.

11. Write the code for calculating the area and perimeter of the rectangle using formulas provided in the prompt.

12. Print the cube area, cube volume, circle area, circle circumference, rectangle area, rectangle perimeter (Complete the existing cout statements).

13. Review the Summary Output.

- Try understanding the setw(n),selfill() and set precision() functions from iomanip library.
- Change the values that are passed into these functions, and see what happens.

14. Your Lab Instructor will explain this section in more detail.

- Use the sample output below as a guide.

15. Your program should execute properly to receive full credit.

16. Submit your properly named source code file on Blackboard, following the instructions of your lab TA.

Sample output:

```
**********************************
*      Lab Assignement 2         *
* CS150 ODU Computer Science     *
* Author: ??????                *
* Date: ????????                *
**********************************

====================CUBE====================

Enter the length    : 4

  Length        :      4.00
  Area          :     96.00
  Volume        :     64.00

====================CIRCLE==================

Enter the radius    : 5

  Radius        :      5.00
  Area          :     78.50
  Circumference :     31.40

====================RECTANGLE===============

Enter the length    : 4
Enter the width     : 5

  length        :      4.00
  width         :      5.00
  Area          :     20.00
  Perimeter     :     18.00

Process returned 0 (0x0)   execution time : 15.936 s
Press any key to continue.
```

Part B. Source code files for this lab are included in the zip file: The examples are taken from the textbook and should look familiar to you, as they follow the topics from start to finish in Chapter 3.

a. **Create a CodeBlocks project** called testBedChapter3 (on your Z drive on the CS network).
b. Open each of the example source code files in CodeBlocks.
c. Examine the source code of the programs line-by-line. Read all of the comments. Instructions for completing parts of the labs may be contained in the source code and comments of the examples.

Compile and run the programs. In the table below, provide a brief description of what each of the example programs is demonstrating. (use your textbook, and the source code comments to help). You will not submit this part for grading. The solutions will be covered in recitation next week.

• Ch3_AverageTestScore	
• Ch3_AverageTestScoreV2	
• Ch3_Clear	
• Ch3_fail	
• Ch3_justified	
• Ch3_MovieTicketsSale	
• Ch3_PeekAndPutbackFunctions	
• Ch3_PredefinedFunctions	
• Ch3_ProgrammingEx2_Code	
• Ch3_ProgrammingEx4_Code	
• Ch3_scientificFixedAndShowpoint	
• Ch3_setFillCharacter	
• Ch3_setPrecisionFixed	
• Ch3_setPrecisionFixedVerB	
• Ch3_setw	
• Ch3_TemperatureConversion_A • Ch3_TemperatureConversion_B • Ch3_TemperatureConversion_C	What is the difference between these 3 versions?
• Ch3_File_IOI_Code	What does this program do? How many files are created? After running it, delete those files and run it again. Check to see that the files are re-created with the new user data each time the program is run.