

**Part A.** Your assignment for this lab, is to write a C++ program that calculates the billing amount for cable company customers. You will create an enhanced version of the example programs that were covered in lecture. I have provided the problem statement from the textbook below, followed by the additional requirements you must implement for this lab assignment.

The purpose of the program is to calculate and print the billing amount for cable company customers. To calculate the billing amount, you need to know the customer for whom the billing amount is calculated (whether the customer is residential or business) and the number of premium channels to which the customer subscribes. In the case of a business customer, you also need to know the number of basic service connections and the number of premium channels. Other data needed to calculate the bill, such as the bill processing fees and the cost of a premium channel, are known quantities. The required information for business customers is the same for government customers (need to know the number of basic service connections and the number of premium channels). This problem analysis translates into an expanded version of the provided algorithm, in our textbook. The program should print the billing amount to two decimal places, which is standard for monetary amounts. Additional requirements include for this lab include:

- Input is from an input data file. Prompt the user for the name of the input file.
- The program will read and process all customer records contained in the input file, and then write all information to the output file.
- Include an additional category of customer – Government, identified with the character 'G' or 'g', and use the following fees for government customers, by implementing named constants:
  - Government bill processing fee = \$47.99
  - Government basic service cost = \$82.33
  - Government basic connection cost = \$7.50
  - Government premium channel cost = \$69.88
- Write all data to the output file, appending the information to the file for each customer processed, and each input file processed.
- The algorithm detailed in our textbook implements the decision structure in steps 6, 7, and 8. You will implement either the switch or the if-else structure in your solution.
  - If your UIN is an even number, you must implement a switch structure.
  - If your UIN is an odd number - you must implement the if-else structure.
- Calculate the total billing amount, and the average billing amount for all customers and display this in the output file.

**Instructions:** Read this document completely before you begin work. THEN -read and run the template source code file (**lab04\_2016\_F\_LName.cpp**) and look for comments that are the hints to solve the problem. You should also, refer to the sample output on the following page as you read through the lab assignment.

- Your program will prompt for the user name and ID, and write this information to the output file. (see example output)
- Your program will prompt the user to enter the name of the input file, so you must add code prompting the user to specify the input file name. Your program will read and process the information for all customers listed in the specified input file.

- The input and output file streams have not been declared and initialized. You did this in lab last week, so see your solution (or mine is posted).
- The data in the sample input file describe one customer per line. See the complete program explanation in the textbook, the example programs provided by the author, and examine the **sample input files: customerInput.txt and customer2.txt**.
- For this lab, we will assume that the input files do not contain any errors, so don't worry about having an invalid customer type.
- Calculate the billing amount for each customer.
- The program then writes the information and calculated values to the output file, including the original information read from the input, and the customers billing amount.
- The output written to the file **must be formatted as shown in the example output**.
- Format the output of decimal numbers to two decimal places.
- Write the output message to the screen as shown, and all other information is written to the output file named: **billingoutput.txt**

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 like that shown in the example output on the following page, ... but with your information filled in. This information is required on all lab assignments this semester. Save your source code file as **lab04\_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.

You will lose points for failing to do each or any of the following:

- Fill out the Preliminary Comments.
- Fill out the programmer info.
- Validate the opening of , and properly closing the input file stream properly
- Name your source code solution file properly.
- Implement the required control structure (switch or if-else), according to the above documentation.
- In your source code - be sure to fill in an updated program description, your name and UIN, and the TA info. Or lose 25 points.

Your program should execute, and run properly to receive full credit. If your program doesn't run, it may not be graded. You may create your own additional input files for testing purposes, however you are not allowed to change the structure of the input files. Do not change the example input files provided.

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

**Sample input file**  
**customerinput.txt**

```
81118 G 32 114
24545 r 3
34343 r 643
66665 R 4
34344 b 3 6
89898 B 32 114
11116 g 45 178
```

**Sample output sent to the output file:**  
( the identical info is appended if you use the same input file again )

Acc#	TYPE	AmntDue
81118	G	8261.64
24545	r	47.50
34343	r	4847.50
66665	R	55.00
34344	b	390.00
89898	B	5900.00
11116	g	12831.46
11116	g	12831.46

**Sample output sent to the monitor:**

**Lab Part B.** Run all the source code examples provided for CHAPTER 5 on our cs-150 website. Examine the source code, and read the comments. Make sure that you understand what is being demonstrated in each of these examples. Please ask questions in lecture, if you need help in understanding or working with these file.