

Programming Assignment - 4  
Due Wednesday October 4<sup>th</sup> , 2021  
9:15 am Section 001  
10:15 am Section 002

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### **Program 4:**

Write a C++ program that will calculate and print out a bill for the city water company. The water rates vary, depending on whether the bill is for residential use, commercial use, or industrial use. A code **r** means it is a residential use, a code **c** means commercial use, and a code **i** means industrial use. Any other code should be treated as **error and the program terminates**. The water rates are computed as follows.

- Code **r** : \$5.00 plus \$0.0005 per gallon used plus \$6.00 community service plus \$8.35 drainage service plus \$7.80 Street Service
- Code **c** : \$1000.00 for the first 2 million gallons used and \$0.00025 for each additional gallon plus \$10.00 community service plus \$12.35 drainage service plus \$15.80 Street Service
- Code **i** : \$1500.00 if usage does not exceed 3 million gallons ; \$2500.00 if usage is more than 3 million gallons but does not exceed 7 million gallons, and \$4000.00 if usage exceeds 7 million gallons plus \$15.00 community service plus \$28.35 drainage service plus \$37.80 Street Service

Your program should prompt the user to enter customer name or company name, account number, the code, and the gallons of water used. Your program should echo on screen the input data entered and print The Bill Summary.

Note : To calculate amount after due date:

- Find 25% of the total amount due.
- Add the calculated amount from the previous step to the total amount due.

**The following variables are defined as constant variables**

**Residential Codes:**

\$5.00  
\$.0005 per gallon  
\$6.00 community service  
\$8.35 drainage service  
\$7.80 Street service

**Commercial Codes:**

\$1000.00  
\$0.00025 for each additional gallon  
\$10.00 community service  
\$12.35 drainage service  
\$15.80 Street Service

**Industrial Codes:**

\$1500.00  
\$2500.00  
\$4000.00  
\$15.00 community service  
\$28.35 drainage service  
\$37.80 Street Service

## **Style Guidelines :**

At the beginning of your program ( and **before** the #include statement ), include the following :

**Header comments** (file documentation block) should be at the top of each file and should contain: Author / s, Due Date, Assignment Number, Course number and section, Instructor, and a brief description of the purpose of the code in the file. For example :

```
// Author : (Your name here!!)  
  
// Due Date  
// Programming Assignment Number 4  
// Fall 2021 - CS 1428 - Section Number  
// Instructor: Husain Ghooloom.  
//  
// <Brief description of the purpose of the program>
```

## **Variable names :**

Must be meaningful.

The initial letter should be lowercase, following words should be capitalized, no other caps or punctuation ( i.e. `weightInPounds` ). Each variable must be declared on a separate line with a descriptive comment.

## **Named constants :**

Use for most numeric literals.

All capitals with underscores ( i.e. `TX_STATE_SALES_TAX` )  
Should occur at top of function, or global (only if necessary)

**Line length** of source code should be no longer than 80 characters (no wrapping of lines).

### **Indentation :**

Use 2-4 spaces (but be consistent throughout your program).

Indent blocks, within blocks, etc.

Use blank lines to separate sections.

### **Comments for variables :**

All variable definitions should be commented as follows:

```
int  gender;      // integer value for the gender,  
                  // 1 = Male ,  
                  // 2 = Female ,
```

## Remarks:

1. Your program **must compile** and run using Code::Blocks 20.03 IDE.
2. Your program must be **documented according the style above** . **See the website for the sample programming style program.**
3. Must properly format the output by use the appropriate library.
4. You are not allowed to use concepts that was not discussed in the class
5. You must name your program as :

1428\_1\_F21\_PA4\_XXXXX\_YYYYYY.cpp ( for Section number 001 )  
1428\_2\_F21\_PA4\_XXXXX\_YYYYYY.cpp ( for Section number 002 )

Where XXXXX is your Last Name and YYYYYY is your First Name. For example , the file name should look something like :

1428\_2\_F21\_PA4\_Gholoom\_Husain .cpp ( **not .cbp** )

- You must upload your programs no later than the starting of class time on the due date. **No late assignments will be accepted. 9:16 am or 10:16 am and after will be considered late and will not be accepted.**

## Use Canvas To upload your program

## **6. The following points will be deducted if :**

- Incorrect file format such as uploading .cbp instead of .cpp ( - 10 ) points
- Compilation Errors , using concepts that was not discussed in the class. ( - 8 points )
- Not using switch statement ( at least - 3 points )
- Logical Errors ( at least - 1 points )
- Incorrect Output format ( at least -0.5 points )
- Incorrect file name ( -0.50 points )
- Incorrect Style such as Missing Header or footer , missing comments or documentations , missing constant variables . Not replacing xxxxxx yyyyyy with your first and last name ( -0.5 points each )

## **Sample Run**

Software Development Valley, Inc  
Water Department

Company or Customer Name : xxxxxxxxxx  
Account Type ( r , or c , or i ) :  
Account Number : .....  
Gallons used :

Amount : \$9999.99  
Community Service : \$9999.99  
Drainage Service : \$9999.99  
Street Service : \$9999.99

Total Amount Due : \$9999.99

Current charges due by 10 / 4 / 2021

After 10 / 4 / 2021 Pay : \$9999.99

Questions : call 1-888-000-000  
xxxxxx yyyy

## **Sample Run**

Software Development Valley, Inc  
Water Department

Company or Customer Name : xxxxxxxxxx  
Account Type ( r , or c , or i ) : x

Unknown account type

Questions : call 1-888-000-000  
xxxxx yyyyyy