

# Simple Bill Printing System

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Assignmentwise

## Problem

You are required to create a billing system for an ISP which provides subscription based internet with additional volume options. There are two subscription plans namely :HomePlan and CorporatePlan. Both the plan have their own base rates and billing structure. Refer to the table below for pricing plans:

Plan	Base Rate	Top Up Rate
HomePlan	NPR 1500 for upto 350 GB	NPR 3 per GB extra
CorporatePlan	NPR 3500 for upto 1000 GB	NPR 1.5 per GB extra

Calculate the total amount for a customer when the final GB usage is provided. Your billing system should account for the taxes applicable according to the Law (13% on the final amount).Your programming solution should have the following functionalities:

- A choice for the user to enter their plan : HomePlan or CorporatePlan
- Once the choice is given, your system should ask for CustomerID, Name and GB consumed.
- Create a short, formatted bill to show final amount to the user
- Your program should ask for a choice to repeat the program after one billing is complete. If the user chooses to, he/she should be able to create another bill without exiting the system.

## Introduction

This C software is intended to compute customers' bill amounts depending on their plan type and total GB consumption. It requests the user's plan type, customer ID, customer name, and total GB consumption. The software determines the basic rate, extra rate, and data limit for each plan type using established constants. The application then computes the customer's entire bill amount, including tax and VAT.

The software initially identifies the plan type supplied by the user before calculating the base rate, extra rate, and data limit using the appropriate preset constants. If the total GB consumption is less than the data limit, the application computes the bill amount using the base rate. If the total GB consumption exceeds the data limit, the software charges the extra usage at the higher rate.

After calculating the bill amount, the computer adds the tax and VAT to the final bill amount. The plan type, customer ID, customer name, total GB consumption, tax, VAT, and total bill amount (with and without tax and VAT) are then displayed to the user.

The user has the choice of repeating the program for another consumer or exiting the program. This enables the application to be utilized for numerous clients without the need to restart it.

## Algorithm

Step 1 Start

Step 2 Declare variables plan, id, name, gb consumed, TA, VAT, TAV, extra gb to store plan, name of customer, Gb consumed by the user, Total Amount without Vat, vat Amount, Total amount with with vat and extra Gb consumed by user.

Step 3 Ask for plan and store it in variable plan.

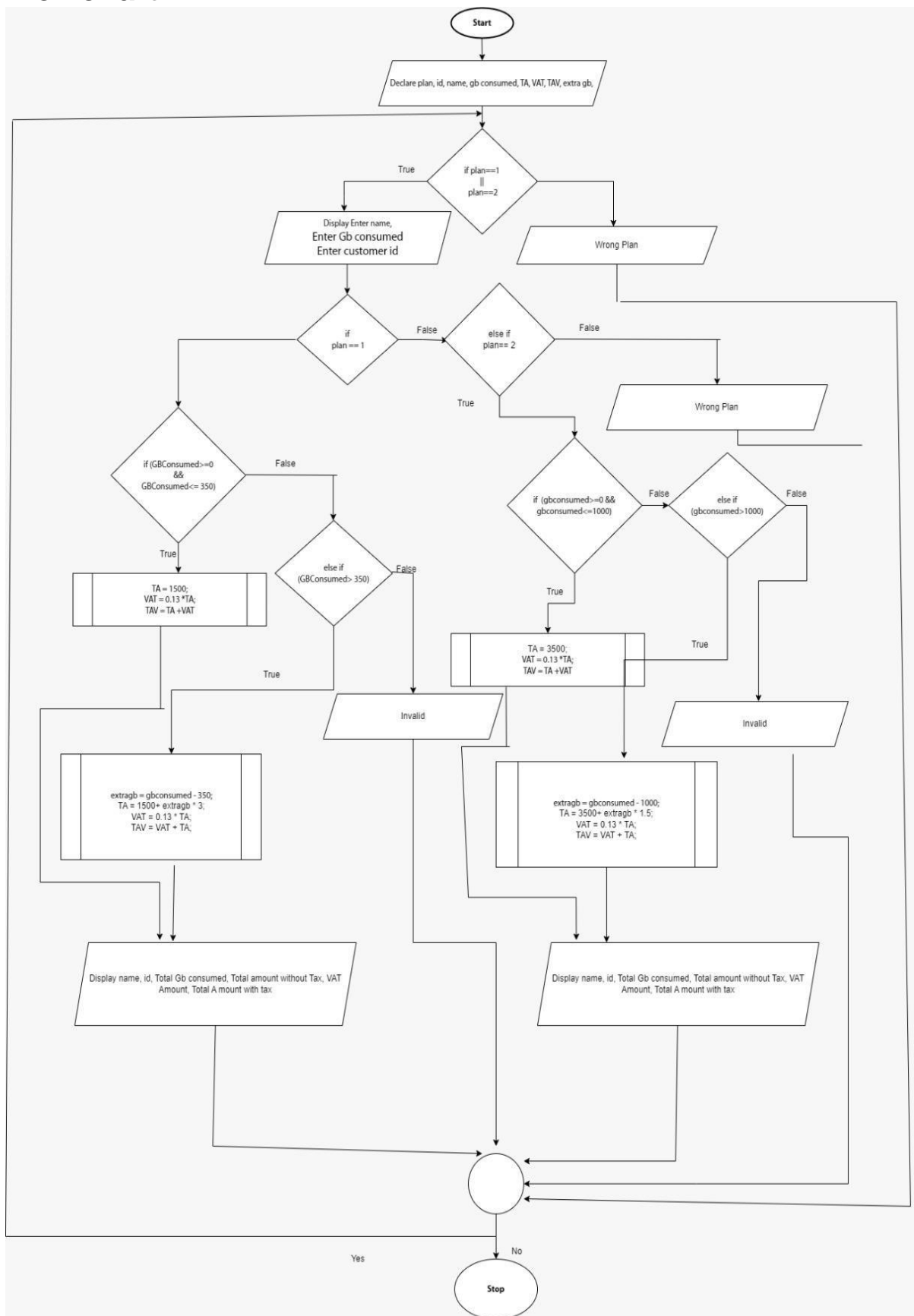
Step 4 If plan == 1 or plan == 2  
Enter name and store it in name variable.  
Enter Gb consumed and store it in gb consumed variable.  
Enter customer Id and store it in variable id.

Step 5 if (plan == 1) {  
    if (gbconsumed >= 0 && gbconsumed <= 350) {  
        TA = 1500;  
        VAT = 0.13 \* TA;  
        TAV = TA + VAT;  
    }  
    else if (gbconsumed > 350) {  
        extragb = gbconsumed - 350;  
        TA = 1500 + extragb \* 3;  
        VAT = 0.13 \* TA;  
        TAV = VAT + TA;  
    }  
    else {  
        printf("Invalid");  
    }  
}  
else if (plan == 2) {  
    if (gbconsumed >= 0 && gbconsumed <= 1000) {  
        TA = 3500;  
        VAT = 0.13 \* TA;  
        TAV = TA + VAT;  
    }  
    else if (gbconsumed > 1000) {  
        extragb = gbconsumed - 1000;  
        TA = 3500 + extragb \* 1.5;  
        VAT = 0.13 \* TA;  
        TAV = VAT + TA;  
    }  
    else {  
        printf("invalid");  
    }  
}  
else {  
    printf("\t\t\tWrong Plan\n");  
}

Step 6      If (plan ==1 || plan ==2) && (gbconsumed >=0)  
              {  
              Display: "name :";  
              Display: "id";  
              Display: "Total Gb consumed";  
              Display: "Total Amount without Tax";  
              Display: "Vat Amount";  
              Display: "Total Amount with Tax";  
Step 7      Display: "Do you want to print new bill:";  
Step 8      Read c;  
Step 9      If c="y" or c="Y" go to step 3 else go to step 10.  
Step 10     Stop

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# Flowchart



## Code

```
#include <stdio.h>
```

```
#include <conio.h>
```

```
int main() {
```

```
    int plan, id;
```

```
    float gbconsumed, TA, VAT, TAV, extragb;
```

```
    char name[50], c;
```

```
    do {
```

```
        printf("Choose your plan from the list below.\n");
```

```
        printf(" 1:Home Plan \n 2:Corporate Plan\n");
```

```
        printf("\nEnter Your plan : ");
```

```
        scanf("%d", &plan);
```

```
        if (plan == 1 || plan == 2) {
```

```
            printf("Enter your Name : ");
```

```
            fflush(stdin);
```

```
            gets(name);
```

```
            printf("Enter your Customer ID : ");
```

```
            scanf("%d", &id);
```

```
            printf("Gb consumed : ");
```

```
            scanf("%f", &gbconsumed);
```

```
        }
```

```
        if (plan == 1) {
```

```
            if (gbconsumed >= 0 && gbconsumed <= 350) {
```

```
                TA = 1500;
```

```
                VAT = 0.13 * TA;
```



```

        TAV = TA + VAT;
    }
    else if (gbconsumed > 350) {
        extragb = gbconsumed - 350;
        TA = 1500 + extragb * 3;
        VAT = 0.13 * TA;
        TAV = VAT + TA;
    }
    else {
        printf("Invalid");
    }
}

else if (plan == 2) {

    if (gbconsumed >= 0 && gbconsumed <= 1000) {
        TA = 3500;
        VAT = 0.13 * TA;
        TAV = TA + VAT;
    }
    else if (gbconsumed > 1000) {
        extragb = gbconsumed - 1000;
        TA = 3500 + extragb * 1.5;
        VAT = 0.13 * TA;
        TAV = VAT + TA;
    }
    else {
        printf("invalid");
    }
}

else {

```

```

        printf("\t\t\tWrong Plan\n");
    }

    if ((plan == 1 || plan == 2) && (gbconsumed >= 0))
    {

        printf("\n\n_____");
        printf("\n\n                Bill");
        printf("\n\n_____ \n");
        printf("Customer Name : %s\n", name);
        printf("Customer ID : %d\n", id);
        printf("Total GB consumed : %.3f\n\n", gbconsumed);
        printf("Total Amount without Tax : NPR %.2f\n", TA);
        printf("VAT Amount : NPR %.2f\n", VAT);
        printf("Total Amount with Tax : NPR %.2f\n", TAV);
    }

    printf("\nDo you want to print another bill?");
    printf("\nType 'Y' or 'y' to print another bill: ");
    fflush(stdin);
    scanf("%c", &c);
    system("cls");

} while (c == 'Y' || c == 'y');

return 0;
}

```

## Test plan and test data to be used with testing

Home Plan					
Customer ID	Customer Name	GB Consumed	Total Amount	VAT Amount	Total Amount With Tax
5210	Avash Raj	0	1500.00	195.00	195.00
		75	1500.00	195.00	1695.00
		350	1500.00	195.00	1695.00
		5000	15450.00	2008.50	17458.50
		-250	Invalid		

Corporate Plan					
Customer ID	Customer Name	GB Consumed	Total Amount	VAT Amount	Total Amount with Tax
5210	Avash Raj	0	3500.00	455.00	3955.00
		555	3500.00	455.00	3955.00
		1000	3500.00	455.00	3955.00
		90000	137000.00	17810.00	154810.00
		-1790	Invalid		

## Output Screenshot

```
Choose your plan from the list below.
```

```
1:Home Plan
```

```
2:Corporate Plan
```

```
Enter Your plan : 1
```

```
Enter your Name : Mohisha_Maharjan
```

```
Enter your Customer ID : 5210
```

```
Gb consumed : 0
```

```
-----  
                        Bill  
-----
```

```
Customer Name : Mohisha_Maharjan
```

```
Customer ID : 5210
```

```
Total GB consumed : 0.000
```

```
Total Amount without Tax : NPR 1500.00
```

```
VAT Amount : NPR 195.00
```

```
Total Amount with Tax : NPR 1695.00
```

```
Do you want to print another bill?
```

```
Type 'Y' or 'y' to print another bill: _
```

```
Choose your plan from the list below.
```

```
1:Home Plan
```

```
2:Corporate Plan
```

```
Enter Your plan : 1
```

```
Enter your Name : Mohisha_Maharjan
```

```
Enter your Customer ID : 5210
```

```
Gb consumed : 75
```

```
-----  
                        Bill  
-----
```

```
Customer Name : Mohisha_Maharjan
```

```
Customer ID : 5210
```

```
Total GB consumed : 75.000
```

```
Total Amount without Tax : NPR 1500.00
```

```
VAT Amount : NPR 195.00
```

```
Total Amount with Tax : NPR 1695.00
```

```
Do you want to print another bill?
```

```
Type 'Y' or 'y' to print another bill:
```

Choose your plan from the list below.

- 1:Home Plan
- 2:Corporate Plan

Enter Your plan : 1

Enter your Name : Mohisha\_Maharjan

Enter your Customer ID : 5210

Gb consumed : 350

---

Bill

---

Customer Name : Mohisha\_Maharjan

Customer ID : 5210

Total GB consumed : 350.000

Total Amount without Tax : NPR 1500.00

VAT Amount : NPR 195.00

Total Amount with Tax : NPR 1695.00

Do you want to print another bill?

Type 'Y' or 'y' to print another bill: \_

Choose your plan from the list below.

- 1:Home Plan
- 2:Corporate Plan

Enter Your plan : 1

Enter your Name : Mohisha\_Maharjan

Enter your Customer ID : 5210

Gb consumed : 5000

---

Bill

---

Customer Name : Mohisha\_Maharjan

Customer ID : 5210

Total GB consumed : 5000.000

Total Amount without Tax : NPR 15450.00

VAT Amount : NPR 2008.50

Total Amount with Tax : NPR 17458.50

Do you want to print another bill?

Type 'Y' or 'y' to print another bill:

```
Choose your plan from the list below.
1:Home Plan
2:Corporate Plan

Enter Your plan : 1
Enter your Name : Mohisha_Maharjan
Enter your Customer ID : 5210
Gb consumed : -250
Invalid
Do you want to print another bill?
Type 'Y' or 'y' to print another bill: _
```

```
Choose your plan from the list below.
1:Home Plan
2:Corporate Plan

Enter Your plan : 2
Enter your Name : Mohisha_Maharjan
Enter your Customer ID : 5210
Gb consumed : 555

-----
                        Bill
-----
Customer Name : Mohisha_Maharjan
Customer ID : 5210
Total GB consumed : 555.000

Total Amount without Tax : NPR 3500.00
VAT Amount : NPR 455.00
Total Amount with Tax : NPR 3955.00

Do you want to print another bill?
Type 'Y' or 'y' to print another bill: _
```

Choose your plan from the list below.

1:Home Plan

2:Corporate Plan

Enter Your plan : 2

Enter your Name : Mohisha\_Maharjan

Enter your Customer ID : 5210

Gb consumed : 1000

-----  
Bill  
-----

Customer Name : Mohisha\_Maharjan

Customer ID : 5210

Total GB consumed : 1000.000

Total Amount without Tax : NPR 3500.00

VAT Amount : NPR 455.00

Total Amount with Tax : NPR 3955.00

Do you want to print another bill?

Type 'Y' or 'y' to print another bill:

Choose your plan from the list below.

1:Home Plan

2:Corporate Plan

Enter Your plan : 2

Enter your Name : Mohisha\_Maharjan

Enter your Customer ID : 5210

Gb consumed : 90000

-----  
Bill  
-----

Customer Name : Mohisha\_Maharjan

Customer ID : 5210

Total GB consumed : 90000.000

Total Amount without Tax : NPR 137000.00

VAT Amount : NPR 17810.00

Total Amount with Tax : NPR 154810.00

Do you want to print another bill?

Type 'Y' or 'y' to print another bill:

Choose your plan from the list below.

1:Home Plan

2:Corporate Plan

Enter Your plan : 2

Enter your Name : Mohisha\_Maharjan

Enter your Customer ID : 5210

Gb consumed : 90000

-----  
Bill  
-----

Customer Name : Mohisha\_Maharjan

Customer ID : 5210

Total GB consumed : 90000.000

Total Amount without Tax : NPR 137000.00

VAT Amount : NPR 17810.00

Total Amount with Tax : NPR 154810.00

Do you want to print another bill?

Type 'Y' or 'y' to print another bill: ☐

Choose your plan from the list below.

1:Home Plan

2:Corporate Plan

Enter Your plan : 2

Enter your Name : Mohosha\_Maharjan

Enter your Customer ID : 5210

Gb consumed : -1790

invalid

Do you want to print another bill?

Type 'Y' or 'y' to print another bill:



## Conclusion

While creating and implementing a rudimentary billing system in C, I got great expertise. I learnt how to utilize constants, switch-case statements, conditional statements, and loops to develop a functional program that fits the requirements of the problem statement through this assignment.

In addition, I learnt how to receive user input, conduct calculations depending on that input, and present the outcome in a proper manner. This project required the usage of input/output functions such as `scanf` and `printf`, and I developed a better grasp of how to utilize these methods to interface with the user.

In addition, I learnt the value of testing and debugging my code to verify that it works properly in a variety of circumstances. I was able to find and rectify any mistakes that appeared by testing the program with different input values and plan kinds, ensuring that the software runs well and generates accurate output.

Overall, finishing this project was a good learning experience that assisted me in improving my programming abilities and understanding of how to design and construct a working application.

## References

1. University (Slides)  
(April 4, 2023)
2. Draw.io (Flowchart)  
<https://draw.io/flowchart/>  
(April 4, 2023)
3. Topper (Online)  
<https://topper.com/gate/introduction-to-c-programming/>  
(April 4, 2023)

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## Marking Scheme

### 20% Design

- UML class diagram with essential attributes and operations.
- Detailed pseudo-code illustrating your design

### 20% quality of the program implementation attributes and operations

- Readability
- Well documented
- Clear and straightforward code
- Provide description for each segment

### 20% Test plan

- Test cases
- Test data
- Expected and actual output
- Comments

### 30% Correctness

- Code produces correct result

### 10% Documentation

- Well-structured with content page, introduction design, test plan, program listing, screen shots and conclusion with reference.