C programming Project

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Github repo link: https://github.com/girlwhocode-maker/project-c-programming.git

BRANCH : SCHOOL OF COMPUTER SCIENCE

BATCH NUMBER : 19

YEAR : 2025_26

1. PROJECT TITLE

Electricity Bill Calculator

Using C Programming & File Handling

2. INTRODUCTION

The Electricity Bill Calculator is a mini-project developed in the C programming language using conditional statements, loops, and basic input/output operations. This system helps calculate electricity consumption charges based on units used and provides a final bill with all applied charges.

3. OBJECTIVE OF THE PROJECT

1. To automate electricity bill calculation.
2. To apply slab-wise calculation using conditions.
3. To demonstrate concepts of loops, functions, and decision-making.
4. To provide a simple and easy-to-understand bill generator using C.

4. TECHNOLOGIES USED

• C Programming
• Conditional statements
• Loops
• Functions

5. PROJECT FEATURES

Enter consumer details

✓ Enter units consumed

✓ Slab-wise calculation

✓ Display final bill with all charges

✓ Save bill to file

✓ Exit system

SYSTEM DESIGN / FLOWCHART

START → Enter Consumer Details → Enter Units → Apply Slabs → Calculate Bill → Display Bill → Save to File → EXIT

7. EXPLANATION OF CODE (VERY SIMPLE LANGUAGE)

1. Functions used for modular code design.

2. Slab-based billing using if-else conditions.

3. File handling to save the bill.

4. Loops used for menu-driven design.

8. OUTPUT SCREENSHOTS (EXPLAIN IN TEXT)

• User enters name, address, and units consumed.

• Program applies the billing formula and prints the final bill.

• Bill is stored in a text file.

9. CONCLUSION

Electricity Bill Calculator project demonstrates basic C programming concepts and provides a practical utility for calculating electricity charges.

10. FUTURE ENHANCEMENTS

• GUI-based calculator

• Online bill payment integration

• Database storage

11. REFERENCES

- C Programming by Yashwant Kanetkar
- Online documentation of C language

CODE

Users > Janu > Documents > programing in C > c project endsems > C c project code modified.c > ...

```c
#include <stdio.h>
#include <stdlib.h>
#include <string.h>

void welcomeScreen();
void customerDetails(char name[], int *custID, int *type);
float calculateDomestic(float units);
float calculateCommercial(float units);
void printBill(char name[], int custID, int type, float units, float amount, float oldBill, float total);
void instructions();
float recalculateIfWrong(float amount, float units, int type);

int main() {
    char name[50];
    int custID, type;
    float units, amount, oldBill, total;

    welcomeScreen();
    instructions();

    customerDetails(name, &custID, &type);

    printf("\nEnter total units consumed: ");
    scanf("%f", &units);

    if (units < 0) {
        printf("\nInvalid unit entry! Program exiting...\n");
        return 0;
    }

    if (type == 1)
        amount = calculateDomestic(units);
    else
        amount = calculateCommercial(units);

    amount = recalculateIfWrong(amount, units, type);
```

```c
int main() {
    recalculateIfWrong(amount, units, type);

    printf("\nEnter previous (old) bill amount (Enter 0 if none): ");
    scanf("%f", &oldBill);

    if (oldBill < 0) {
        printf("\nInvalid old bill! Setting to 0.\n");
        oldBill = 0;
    }

    total = amount + oldBill;

    printBill(name, custID, type, units, amount, oldBill, total);

    printf("\nThank you for using Electricity Bill Calculator!\n");
    return 0;
}

void welcomeScreen() {
    printf("================================================\n");
    printf("          ELECTRICITY BILL CALCULATOR           \n");
    printf("================================================\n");
}

void instructions() {
    printf("\nThis program calculates electricity bills.\n\n");
}

void customerDetails(char name[], int *custID, int *type) {
    printf("Enter Customer Name: ");
    fflush(stdin);
    fgets(name, 50, stdin);
    name[strcspn(name, "\n")] = '\0';

    printf("Enter Customer ID: ");
    scanf("%d", custID);
```

```c
    printf("\nSelect Connection Type:\n");
    printf("1. Domestic\n");
    printf("2. Commercial\n");
    printf("Enter choice: ");
    scanf("%d", type);

    if (*type != 1 && *type != 2) {
        printf("Invalid type selected! Defaulting to Domestic.\n");
        *type = 1;
    }
}

float recalculateIfWrong(float amount, float units, int type) {
    int choice;

    printf("\nChecking bill validity...\n");

    if (amount <= 0)
        printf("ERROR: Bill amount seems incorrect.\n");

    if (amount > 100000)
        printf("\nALERT: Bill amount extremely high!\n");

    printf("\nDoes the bill amount look correct?\n");
    printf("1. Yes\n");
    printf("2. No, recalculate manually\n");
    printf("Enter choice: ");
    scanf("%d", &choice);

    if (choice == 2) {
        float corrected;
        printf("\nEnter corrected bill amount: ");
        scanf("%f", &corrected);

        if (corrected <= 0) {
```

```c
    if (choice == 2) {
        if (corrected <= 0) {
            printf("Invalid corrected bill! Setting to 0.\n");
            return 0;
        }

        if (corrected > 200000)
            printf("WARNING: Corrected bill very high!\n");

        return corrected;
    }

    return amount;
}

float calculateDomestic(float units) {
    float amount = 0;

    if (units <= 100)
        amount = units * 3;
    else if (units <= 200)
        amount = (100 * 3) + (units - 100) * 4.5;
    else if (units <= 500)
        amount = (100 * 3) + (100 * 4.5) + (units - 200) * 6;
    else
        amount = (100 * 3) + (100 * 4.5) + (300 * 6) + (units - 500) * 7.5;

    float fixedCharge = 50;
    float tax = amount * 0.05;
    return amount + fixedCharge + tax;
}

float calculateCommercial(float units) {
    float amount = 0;
```

```c
float calculateCommercial(float units) {
    float amount = 0;

    if (units <= 100)
        amount = units * 5;
    else if (units <= 300)
        amount = (100 * 5) + (units - 100) * 7.5;
    else if (units <= 600)
        amount = (100 * 5) + (200 * 7.5) + (units - 300) * 10;
    else
        amount = (100 * 5) + (200 * 7.5) + (300 * 10) + (units - 600) * 12;

    float fixedCharge = 120;
    float tax = amount * 0.12;
    return amount + fixedCharge + tax;
}

void printBill(char name[], int custID, int type, float units, float amount, float oldBill, float total) {
    printf("\n============================================\n");
    printf("               ELECTRICITY BILL              \n");
    printf("============================================\n");

    printf("Customer Name : %s\n", name);
    printf("Customer ID   : %d\n", custID);
    printf("Connection    : %s\n", (type == 1) ? "Domestic" : "Commercial");
    printf("Units Consumed: %.2f\n", units);

    printf("--------------------------------------------\n");
    printf("Current Bill Amount : ₹ %.2f\n", amount);
    printf("Previous Bill       : ₹ %.2f\n", oldBill);
    printf("--------------------------------------------\n");
    printf("TOTAL PAYABLE       : ₹ %.2f\n", total);
    printf("--------------------------------------------\n");

    if (total < amount)
        printf("Total seems incorrect! Old bill might be wrong.\n");
```

```
    printf("Connection    : %s\n", (type == 1) ? "Domestic" : "Commercial");
    printf("Units Consumed: %.2f\n", units);

    printf("-----------------------------------------------\n");
    printf("Current Bill Amount : ₹ %.2f\n", amount);
    printf("Previous Bill       : ₹ %.2f\n", oldBill);
    printf("-----------------------------------------------\n");
    printf("TOTAL PAYABLE       : ₹ %.2f\n", total);
    printf("-----------------------------------------------\n");

    if (total < amount)
        printf("Total seems incorrect! Old bill might be wrong.\n");
    else
        printf("Total calculation verified.\n");

    if (units > 500)
        printf("Note: High usage detected! Try saving electricity.\n");
}
```

OUTPUT

```
         ELECTRICITY BILL CALCULATOR
================================================

This program calculates electricity bills based on:
1. Customer Type (Domestic/Commercial)
2. Units consumed
3. Slab-wise tariff

Enter Customer Name: jahnvi
Enter Customer ID: 1234567

Select Connection Type:
1. Domestic
2. Commercial
Enter choice: Domestic
Invalid type selected! Defaulting to Domestic.

Enter total units consumed:
================================================
```

```
================================================
                ELECTRICITY BILL
================================================
Customer Name: jahnvi
Customer ID   : 1234567
Connection    : Domestic
Units Consumed: 0.00
------------------------------------------------
Total Amount Payable: ₹ 50.00
------------------------------------------------

Thank you for using Electricity Bill Calculator!
```