BS CY Discount Calculator for E-Commerce 2025

A Project Report
on
Discount Calculator for E-Commerce

by

Shayan Ullah Arif
BCY243014
Laiba Waheed Abbasi BCY243008

A Project Report submitted to the
DEPARTMENT OF ELECTRICAL AND COMPUTER ENGINEERING
in partial fulfillment of the requirements for the degree of
BACHELORS OF SCIENCE IN ELECTRICAL ENGINEERING

Faculty of Engineering
Capital University of Science & Technology, Islamabad

Content Page

1. Introduction

In today's competitive retail and e-commerce environment, calculating the final price after applying discounts is essential for maintaining transparent pricing and customer satisfaction. However, performing these calculations manually can often lead to errors, especially when dealing with multiple pricing strategies. This project aims to automate the process of discount calculation, ensuring accuracy, efficiency, and ease of use.

The goal of our project is to develop a simple yet effective C++ program that allows users to calculate the final price of a product based on two types of discounts: percentage-based and fixed-amount discounts. By implementing this system, businesses can speed up their discount application processes, reducing human error and improving customer experience.

In this report, we will explain the problem that led to the creation of the Discount Calculation System, the methodologies used to develop the system, provide the complete source code, present the results from various test cases, and conclude with some future directions for improvement.

2. Problem Definition

The problem arises when businesses need to apply discounts to products, either as a percentage of the original price or as a fixed amount. Depending on the discount type, calculating the final price after applying the discount can involve different steps, leading to potential human errors.

For instance:

- **Percentage Discount:** A discount given as a percentage of the product’s price (e.g., 20% off).
- **Fixed Discount:** A discount given as a fixed monetary amount (e.g., $15 off).

Without an efficient tool, employees might make mistakes during these calculations, resulting in incorrect pricing and potentially affecting business profits or customer trust. This issue becomes more pronounced in larger businesses where multiple discounts are applied across numerous products.

This project seeks to solve this problem by automating the calculation process, allowing users to enter a product price and select the type of discount they wish to apply. The system will then compute and display the final price accurately.

3. Methodologies Used

The development of this system followed a structured approach, leveraging standard programming techniques and best practices:

1. **Problem Analysis & Requirement Gathering:**

2. The first step was to understand the core problem: how to automate the calculation of discounts. We identified the need for two primary discount methods: percentage-based and fixed-amount discounts. This laid the foundation for designing the program.

3. **System Design:**

The program was designed to be simple and user-friendly. The system asks for the original price of the product, then prompts the user to choose between two discount options. After receiving the user's input, the program computes the discount based on the selected type and displays the final price.

4. **Implementation Using C++:**

The code was written using C++ due to its efficiency and familiarity in handling user inputs and arithmetic operations. The following constructs were used:

   a. **Variables** to store the product price, discount percentage, and fixed discount value.
   b. **Conditionals (if-else)** to distinguish between the two discount types and calculate the final price accordingly.
   c. **Input and Output** for seamless interaction with the user, providing prompts and displaying results.

5. **Testing and Debugging:**

Multiple test cases were executed to ensure the program works correctly under various conditions:

a. Normal inputs with valid percentages and fixed amounts.
b. Handling of invalid discount types to ensure the program doesn’t crash.
c. Verifying accuracy of the final price calculations with edge cases (e.g., 0% discount or a very large fixed discount).

4. Code

Here is the complete code for the Discount Calculation System:

```
#include <iostream>
using namespace std;

int main(){
  float price, percentageDiscount, fixedDiscount;
```

```
int discountType;

cout << "Enter the price of the product: ";
cin >> price;

cout << "Choose the type of discount: " << endl;
cout << "1. Percentage Discount" << endl;
cout << "2. Fixed Amount Discount" << endl;
cin >> discountType;

float finalPrice = 0;  // Initialize finalPrice to a default value

if (discountType == 1){
   cout << "Enter the discount percentage: ";
   cin >> percentageDiscount;
   finalPrice = price - (price * (percentageDiscount / 100));
} else if (discountType == 2){
   cout << "Enter the fixed discount amount: ";
   cin >> fixedDiscount;
   finalPrice = price - fixedDiscount;
} else {
   cout << "Invalid discount type chosen!" << endl;
}

// Only print finalPrice if it's properly calculated
if (discountType == 1 || discountType == 2) {
   cout << "The final price after discount is: " << finalPrice << endl;
}

return 0;
```

5. Results

The program was tested with various scenarios to ensure its reliability. Here are the results from the test cases:

1. **Test Case 1:**
    a. Input: Product Price = $100, Discount Type = Percentage, Discount = 20%
    b. Output: Final Price = $80.00
2. **Test Case 2:**
    a. Input: Product Price = $150, Discount Type = Fixed Amount, Discount = $30

    b. Output: Final Price = $120.00

3. **Test Case 3:**
    a. Input: Product Price = $50, Discount Type = Invalid Discount
    b. Output: "Invalid discount type chosen!"

From the test results, we can conclude that the program works as intended for both percentage-based and fixed-amount discounts. The error handling mechanism is also effective, prompting users with an error message when an invalid discount type is entered.

7. References

1. *C++ Programming Language* by Bjarne Stroustrup
2. *Beginning C++ Through Game Programming* by Michael Dawson
3. *C++: The Complete Reference* by Herbert Schildt
4. Online documentation and tutorials from cplusplus.com
5. *Practical C++ Programming* by Steve Oualline