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Project Title: AgroMart Billing System

Abstract

The AgroMart Billing System is a structured C-language project designed to automate the invoice creation process for agricultural stores dealing in pesticides and fertilizers. The system simplifies billing by using modular programming, enabling accurate GST calculation, structured data management using C structures, and clean separation of concerns through multiple header and implementation files. The primary purpose is to produce error-free billing while demonstrating robust programming practices suitable for real-world applications.

Introduction

Billing in agricultural shops is traditionally done manually, which often leads to calculation errors, inconsistencies in GST application, and delays. As the agricultural sector heavily depends on correct chemical measurements and taxation rules, manual errors can cause financial loss or legal issues. This project aims to implement a computerized billing system that enhances accuracy, speed, and clarity in generating purchase invoices. The goal is also to strengthen programming concepts such as structures, modularity, dynamic input handling, and formatted output generation.

Problem Statement

Agricultural shops face challenges such as: 1. Manual GST calculation for both fertilizers and pesticides. 2. Risk of human error in computing item totals and grand totals. 3. Difficulty in maintaining a structured format for printed invoices. 4. Lack of modular, maintainable software tools for small-scale shops. This project resolves these issues by automating calculations, enforcing a standard invoice format, and providing a modular C-based solution that can be extended easily in the future.

Objectives

• To automate GST-based billing for pesticides and fertilizers. • To design a modular system with separate header and source files. • To ensure accuracy in SGST, CGST, and total amount calculations. • To handle multiple items dynamically with the use of structures. • To generate a clean and professional tax invoice summarizing all buyer and item details. • To demonstrate real■world application of C programming concepts.

System Requirements

Hardware Requirements
• A standard computer system with at least 2 GB RAM
• Keyboard for input
• Console/terminal access

Software Requirements
• GNU GCC Compiler / MinGW / Turbo C
• Windows / Linux / macOS
• Text editor (VS Code, Sublime, Notepad++, etc.)

System Design

The system follows a modular architecture divided into multiple files: • main.c – Manages workflow, prints headers, and displays final totals. • buyer.c – Collects and stores buyer information. • Item_Detail.c – Manages item list, GST rules, and price calculations. • structure.h – Defines the structure used and declares global variables. • buyer.h / Item_Detail.h – Contain function prototypes.

Data Flow:
User Input → Buyer Details → Item Entry → GST Calculation → Total → Invoice Display

Implementation Details

The system uses a structure `Items` to store product information such as product name, quantity, rate, number of items, and calculated amount. Global variables track total GST and bill amount for both product categories.

The GST rules applied: • Pesticides: 18% (9% SGST + 9% CGST) • Fertilizers: 5% (2.5% SGST +

2.5% CGST)

The "Item_Detail" function processes multiple items in a loop, computes GST, and prints individual and cumulative totals. The "buyer" function formats customer details, while "main.c" manages program flow and invoice output.

Testing and Validation

The system was tested using various input combinations: • Single and multiple items • Edge cases such as zero values • Different GST categories • Long product names • Incorrect inputs (validated manually)

In all scenarios, calculations were accurate and invoice formatting remained stable.

Conclusion

The AgroMart Billing System successfully automates invoicing for agricultural shops using a structured approach in C. It minimizes human error, enforces standardized GST calculations, and enhances readability of printed bills. The project demonstrates the practical application of modular coding, file handling concepts, and structured data in C.

Future Enhancements
• Adding file storage for invoice history • Implementing a graphical user interface • Including discounts and coupon logic • Adding database connectivity for inventory management