C programming project

Project Report

1. Project title :- Inventory management system

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2. ABSTRACT

The Inventory Management System is a console-based application developed using the C programming language. The purpose of this project is to efficiently manage product details such as ID, name, quantity, and price. The system supports essential operations including adding products, updating details, deleting entries, searching for products, displaying available inventory, and permanently storing data using text file handling.

The project uses C structures, user-defined functions, file handling, loops, conditional logic, and safe input handling using fgets() and sscanf(). The system overcomes limitations of manual record-keeping such as errors, inconsistencies, and slow searching. This project serves as a practical demonstration of core C programming concepts and their real-world application.

3. Problem Definition

Manual methods of managing inventory—such as noting records in registers or spreadsheets—lead to several issues including data loss, difficulty in updating stock, accidental duplication, and slow searching. As the number of products increases, maintaining accuracy becomes more challenging. Human errors, incorrect entries, and lack of proper structure further reduce efficiency.

The problem is to design a system that reliably stores inventory items and enables quick operations like search, update, delete, and display. The solution must provide a user-friendly interface, minimize errors, and store information permanently.

This project aims to develop an **Inventory Management System in C** using structures and file handling to ensure accurate and efficient management of product information in a small-scale business environment.

4. System Design and Algorithms

. Flow Chart
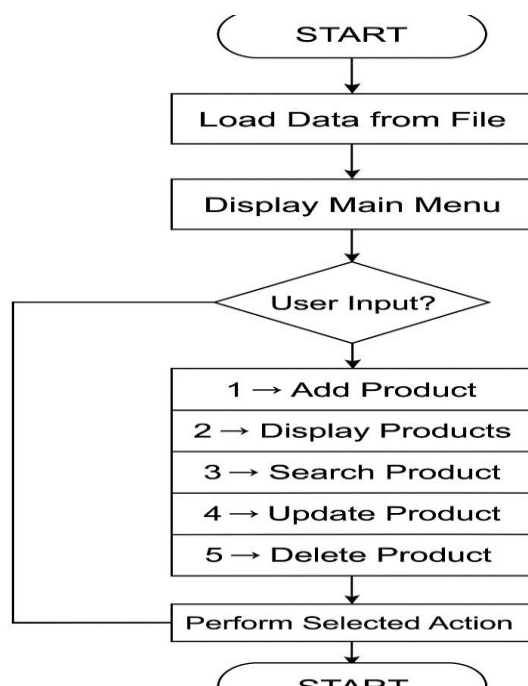
.Algorithms

1. Algorithm: Add Product

1. Prompt user for product ID

2. Prompt for product name

3. Prompt for quantity

4. Prompt for price

5. Store details in structure array

6. Increment counter
7. Print success message

2. Algorithm: Search Product

1. Ask user for ID to search

2. Traverse product array

3. If ID matches → print product details

4. Else print "Not Found"

3. Algorithm: Update Product

1. Ask user for ID

2. Search for matching ID

3. If found → ask new quantity and new price

4. Update values

5. Else print "Product Not Found"

4.Algorithm: Delete Product

1. Ask user for ID

2. Search for product

3. If found → shift all elements left

4. Reduce product count

5. Print success message

5.Algorithm: Save to File

1. Open file in write mode

2. Loop through product array

3. Write data using fprintf

4. Close file

5. Implementation Details

Technologies Used

- C Programming Language

- File handling (fopen, fprintf, fscanf)

- Structures

- Modular function usage

- Safe input handling using fgets and sscanf

. Code Snippets

. Structure Definition

```c
struct Product {
    int id;
    char name[50];
    int quantity;
    float price;
};
```

. Add Product Function

```c
void addProduct(struct Product p[], int *n) {
    p[*n].id = inputInt("Enter Product ID: ");
    inputString("Enter Product Name: ", p[*n].name);
    p[*n].quantity = inputInt("Enter Quantity: ");
    p[*n].price = inputFloat("Enter Price: ");

    (*n)++;
    printf("Product Added Successfully!\n");
}
```

. File Saving

```c
void saveToFile(struct Product p[], int n) {
    FILE *fp = fopen("inventory.txt", "w");
    for (int i = 0; i < n; i++) {
        fprintf(fp, "%d %s %d %.2f\n",
                p[i].id, p[i].name, p[i].quantity, p[i].price);
    }
    fclose(fp);
}
```

6. Testing & Results

Sample Test Cases

Test Case 1: Add Product

Input:

```
===== Inventory Management System =====
1. Add Product
2. Display Products
3. Search Product
4. Update Product
5. Delete Product
6. Save & Exit
Enter your choice: 1
Enter Product ID: 1
Enter Product Name: LED Tv
Enter Quantity: 200
Enter Price: 20000
```

Output :

```
Product Added Successfully!
```

Test Case 2: Search Product

Input:

```
===== Inventory Management System =====
1. Add Product
2. Display Products
3. Search Product
4. Update Product
5. Delete Product
6. Save & Exit
Enter your choice: 3
Enter Product ID to search: 1
```

Output:

```
Product Found:
ID: 1
Name: LED Tv
Quantity: 200
Price: 20000.00
```

Test Case 3: Delete Product

Input:

```
===== Inventory Management System =====
1. Add Product
2. Display Products
3. Search Product
4. Update Product
5. Delete Product
6. Save & Exit
Enter your choice: 5
Enter Product ID to delete: 1
```

Output:

```
Product Deleted Successfully!
```

7. Conclusion & Future Work

. Conclusion

This Inventory Management System successfully demonstrates how C programming concepts can be used to solve real-life problems. The project uses structures, file handling, user-defined functions, safe input handling, and loops. It provides a simple and effective way to manage small-scale inventories, reducing human error and improving data accessibility.

Future Work

The system can be improved by adding:

- Sorting options (ID, name, price)

- Login/authentication

- Better data encryption

- GUI using GTK or web interface

8. References

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