

Supermarket Management System in C

1. *Project Introduction:*

A console-based supermarket management program in C that can handle basic inventory management tasks and store product details of a supermarket or store locally. The program provides the following features -

- Saving stock details of the inventory
- A secure login system to safeguard it from unauthorized access
- A main menu to navigate throughout different features
- Checking product stock status
- Adding new products to the inventory
- Searching products in the inventory
- Editing product details of any existing item
- Deleting products from the inventory
- Updating stock quantity by registering sales

2. *Background:*

The project is built in C as per project requirements and fully made from scratch without following any existing system or design.

Strictly ASCII character-based design for universal terminal support.

3. *Purpose and Benefits:*

The program aims to provide a suitable environment for the user to safely manage the product details of the stock of a shop or supermarket. Only authorized users that know the password can access the program menu.

The program offers the user the features to add, edit, delete and view the registered product details. Aside from these basic features the user can also register transactions to automatically update product stock through a sales management feature.

This is an improvement on the basic modifying (view, add, edit and delete) model. This additional feature will allow the user to update the inventory without manually editing the details which reduces the hassle on a day-to-day basis.

4. System Features:

The program is safeguarded behind a login system from unauthorized access. After a user has successfully logged in a main menu will appear showing 7 different options ranging from 0 to 6. These 7 different options are as following:

1) Viewing Products (Option 1):

The user can view the products through this function. To access the user will have to enter 1. Upon enter 1 the user will be faced with two more options-

1. View All Products (Option 1): To access this the user will have to enter 1 again. This option will allow the user to view all the available products in the inventory.
2. View Products by Category (Option 2): Upon entering 2 in this prompt, the user will be prompted with a screen to input category. After entering a category, the user will be able to see all the products available in that specific category.

If no product is available in the inventory, selecting both options will show the message - "No product available at the moment".

2) Adding New Product (Option 2): To add a new product to the inventory the user can use this option. Upon entering 2, the user will be met with a prompt screen to enter the following things-

1. Product ID
2. Product Name
3. Product Category
4. Product Price &
5. Product Quantity

If inventory reaches over the limit of products an error message- "Inventory full, cannot add more" will show.

3) Searching Products (Option 3): Upon selecting 3, the user can search for product in two ways-

1. Search by First Letter: This can be accessed by further inputting 1. After that user will be asked for a character input and upon entering will show results for all the products with matching first word with the letter.
2. Search by Matching Keyword: To search for a product by a matching name, the user can enter 2 here. After that the user will be prompted for a keyword that will be used to partially search for the matching products.

If no product is found a not found message will show for each option.

- 4) Updating Products (Option 4): To update details of a product the user can enter 4. After that the user will be prompted for a product ID or Name. Upon entering either of them, if the product is found, a confirmation message will be prompted if the user wants to edit the product or not. Upon entering 'y' the user will be prompted for options again. This time the user can-

1. Choose to edit all details of that product by entering 0.
2. Choose to edit specific details of that product by entering-

I. 1 to edit product ID

II. 2 to edit product Name

III. 3 to edit product Category

IV. 4 to edit product Price

V. 5 to edit product Quantity

- 5) Deleting a Product (Option 5): If the user wants to delete a product from the inventory, after selecting 5 the user can do it two ways from the next prompt.

1. Delete by Product ID: Upon selecting 1, prompts user for product ID. If a correct product ID is entered exactly the same, deletes that product.
2. Delete by Partial Name: If the user selects 2, a screen prompting for partial product name will appear. The input will search for any match with the keyword partially and delete them altogether.

- 6) Sales Management System (Option 6): The user can register successful transactions via this option. Upon selecting 6, the user will be prompted for

product ID and if entered successfully will be prompted for quantity to sell. If there is enough product on the stock, the sales will register successfully and update the product quantity automatically. If there is not enough stock to be sold, the registering will fail and show an error message along with showing available product quantity.

- 7) User Logout (Option 0): After the user is done using the program, they can exit the program by entering 0 in the main menu. This will log the user out of the program menu.

5. User Stories:

Anonymous User 1:

“As a stock manager, I want to use the Sales Management System to update the stock quantity of the products of my market. It looks like I can easily just enter a product ID and quantity sold to update the stock automatically. Along with that I am hoping for a feature to keep track of the items sold so I can calculate the profit-loss more easily”.

Anonymous User 2:

“As a cashier, I want to use the Sales Management System to easily register the day to day sales of the supermarket I work in. It seems to be automatically updating the stock after every sale. A more developed version of this with more features can definitely be used locally on our personal systems.”

6. Advantages:

- I. Cross platform compatibility for Windows and Unix based system.
- II. Can categorically filter out products for easier navigation.
- III. Product viewing by category, search, edit and delete functions are case insensitive.
- IV. Handles incorrect and unexpected inputs throughout all the way in the Program.
- V. Prevents addition of duplicate product ID while adding products
- VI. Self-developed function to prevent larger than allocated character inputs for strings.
- VII. Added pause in between program execution and loading animation for smoother user experience.

7. Limitations:

- I. Hardcoded password for user authentication.
- II. Does not use dynamic memory allocation for inventory management.
- III. Limited character input for product ID, name and category.
- IV. Static display formatting while showing products.
- V. Lack of features in Sales Management System like- transaction logs.

8. Topics Covered:

The following topics have been implemented throughout the development of the project:

- Variables and Data Types
- Arrays
- Structures
- Loops (for, while, do...while)
- Conditional statements (If-else, Switch-case)
- Strings
- Functions
- Files
- Pointers

9. Screenshots:

1. How Check Products Info:

After successfully logging in and reaching the main menu, enter 1 to access product viewing options. An interface like this will appear:

```
[1] View All Products
[2] View Products by Category

>> Enter Your Choice: |
```

Upon entering 1, all available products in the inventory will be shown.

Serial No.	Product ID	Product Name	Category	Price	Quantity
1	002	Bread	Food	5.99	7
2	001	Milk	Drink	10.00	6
3	003	Meat	Food	13.49	4
4	004	Boba Tea	Drink	8.99	11

Press Enter to continue...|

Entering 2 will prompt for category and after entering a correct one, it will show products in that specific category.

Products Under Drink Category					
Serial No.	Product ID	Product Name	Category	Price	Quantity
2	001	Milk	Drink	10.00	6
4	004	Boba Tea	Drink	8.99	11

Press Enter to continue...|

2. How to Add a Product:

To add a product, enter 2 in the main menu and fill out the prompts of products details like this:

```
Enter product ID: 005
Enter product name: Coffee
Enter product category: Drink
Enter product price: 9.99
Enter quantity to add: 5|
```

After successfully entering all details, you can check from the viewing section that the product has been successfully added.

Serial No.	Product ID	Product Name	Category	Price	Quantity
1	002	Bread	Food	5.99	7
2	001	Milk	Drink	10.00	6
3	003	Meat	Food	13.49	4
4	004	Boba Tea	Drink	8.99	11
5	005	Coffee	Drink	9.99	5

Press Enter to continue...|

3. How to search for specific products:

To search for a specific product, enter 3 in the main menu. It will show this

interface:

```
[1] Search by First Letter
[2] Search by Matching Keyword
>> Enter choice: |
```

Now to narrow down a product, you can either search by first letter of that product entering 1

Serial No.	Product ID	Product Name	Category	Price	Quantity
2	001	Milk	Drink	10.00 \$	6
3	003	Meat	Food	13.49 \$	4

Press Enter to continue...|

(Search result after searching by the first letter M)

Or use a matching keyword to search products by partial name matching entering 2.

4. How to Edit Product Details:

To edit product details of a product, enter 4 in the main menu and enter product ID or name of the product precisely.

```
Enter Product ID or Name to search: 002|
```

After successfully entering one of them, a menu like this will show for a confirmation

```
Product Found:  
ID: 002  
Name: Bread  
Category: Food  
Price: 5.99$  
Quantity: 7  
  
Do you want to edit this product? (y/n): |
```

Enter y to confirm the edit or n to return to main menu.

After entering y, a menu asking for prompt like this will show:

```
Select field to edit:  
[0] Edit All  
[1] ID  
[2] Name  
[3] Category  
[4] Price  
[5] Quantity  
>> Your choice: |
```

Enter 0 to edit all details of a product or 1-5 as needed for specific change.

```
>> Your choice: 1  
New ID: 000|
```

Here as an example, I am changing the product ID of a product.

After the changes I can see them in the products viewing sections.

Serial No.	Product ID	Product Name	Category	Price	Quantity
1	000	Bread	Food	5.99 \$	7
2	001	Milk	Drink	10.00 \$	6
3	003	Meat	Food	13.49 \$	4
4	004	Boba Tea	Drink	8.99 \$	11
5	005	Coffee	Drink	9.99 \$	5

Press Enter to continue...|

5. How to delete a product:

To delete a product, enter 5 in the main menu. After that an interface like this will show.

```
[1] Delete by Product ID
[2] Delete by Partial Name
>> Enter choice: |
```

Enter 1 to delete a product by specific product ID or 2 to delete products with partial name matching.

```
>> Enter choice: 1
Enter Product ID: 005|
```

Here I am choosing first option to demonstrate an example.

```
1 product(s) deleted successfully.
```

A successful delete will show a message like that on screen.

Serial No.	Product ID	Product Name	Category	Price	Quantity
1	000	Bread	Food	5.99 \$	7
2	001	Milk	Drink	10.00 \$	6
3	003	Meat	Food	13.49 \$	4
4	004	Boba Tea	Drink	8.99 \$	11

Press Enter to continue...|

After checking it can be confirmed that the product has been successfully deleted.

6. How to use Sales Management System:

The sales management system is the sixth option in the program, shown as

“Register Sales” in the main menu. After entering 6, the user will be prompted for a product ID.

```
Enter Product ID to sell: 004|
```

After entering that correctly the user will be prompted again for quantity to be sold.

```
Enter quantity to sell: 1|
```

After successfully registering a transaction a confirmation message will appear.

```
1 Boba Tea/s have been successfully sold!
```

And we can check from the view product option that the product quantity went down by 1.

4		004		Boba Tea		Drink		8.99		\$	10
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10. Future Work:

Admittedly the project work is not ideal for a real-world use case since it lacks several features due to still being in early stage of development. If this program were to be developed further, some implementations of features would increase its practicality tremendously. They are such as-

- Dynamic memory allocation to save product inventory info flexibly.
- Use of pointers to reduce consumption of computing resources.
- Adding an encrypted password system by using files and encryption keys.
- Adding more features in Sales Management System like transaction logs for keeping records of transaction history.