

PROJECT REPORT

Course: Programming Fundamentals (CT-175)

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Problem Statement:

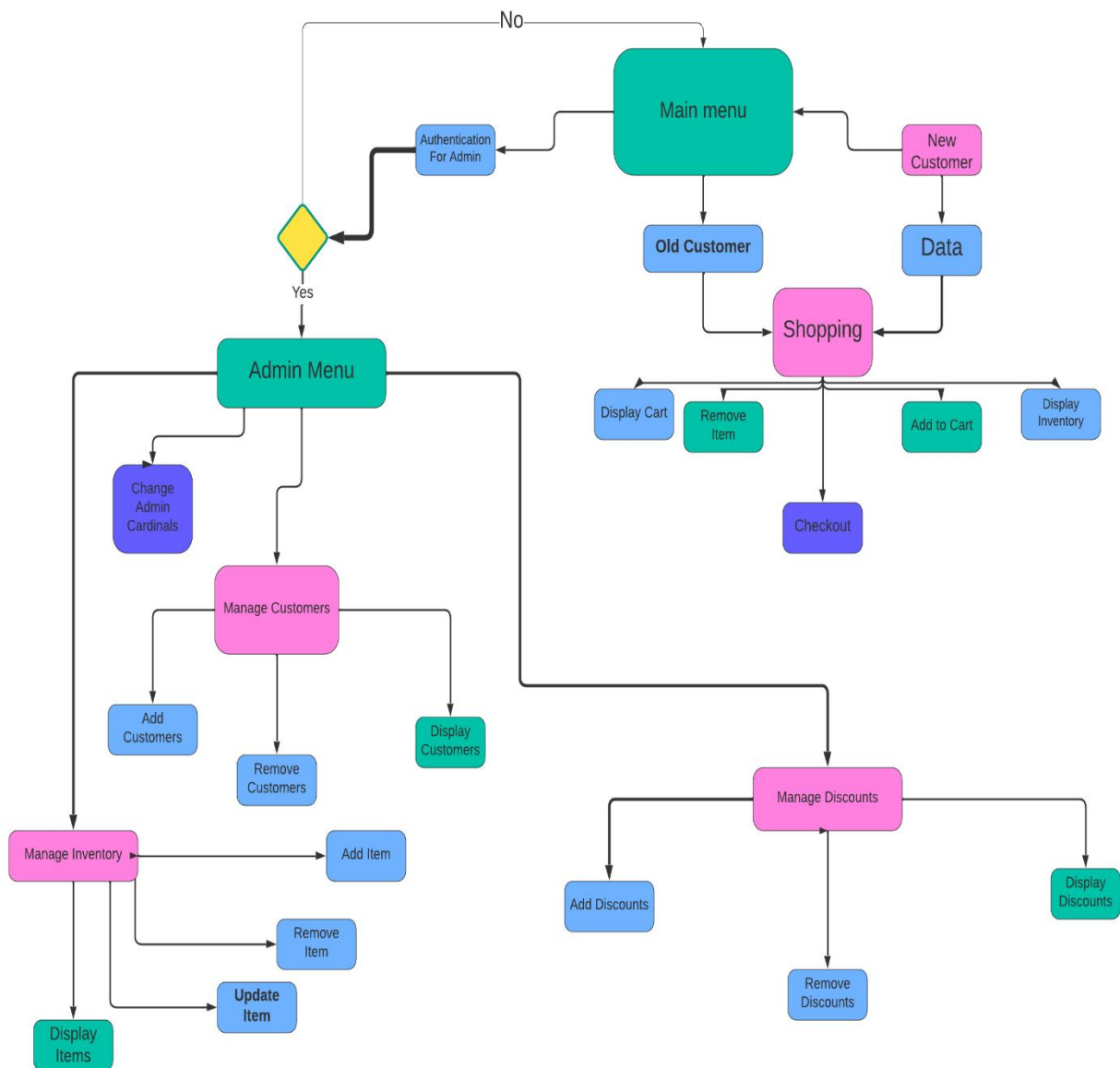
The problem:

Running a superstore and managing its data, which includes inventory, customer information, and checkout records is necessary for shopkeepers. However, doing all of this manually can be a significant challenge for them. Firstly, managing this large amount of data manually is not user-friendly. Secondly, it can lead to errors while managing inventory, registering customers, and administering discounts. Moreover, this old register method is time-consuming and inefficient.

The proposed solution:

Keeping in mind, the problems faced by shopkeepers regarding data handling, we designed a Kirana OR General Store Data Base Management System. This program includes an interface with admin access where the shopkeeper can handle store inventory, and manage customers and discounts. The financial management of the shop can be done through this program. Other than that, the program provides a digital ordering system for customers at the local level. The program aims to provide an efficient way to manage data for shopkeepers with no chance of error.

Functionalities Map:



Functionalities:

Main Menu:

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Main Function:

Main function Firstly, load customers from Customer file, Inventory from inventory file and then give the user options, that whether he want to continue with admin account, new customer(If new than registered him/her first), old customer, etc.

Then redirect them to their respective functions.

```

1151 int main() {
1152     struct Customer newCustomer;
1153     char customerPhoneNum[20] ;
1154     int pin;
1155     int choice;
1156     loadCustomersWithDiscountsFromFile( ) ;
1157     loadInventoryFromFile("inventory_data.txt");
1158     gotoxy(84, 0) ;
1159     printf("Admin Interface Formattion Credits: ") ;
1160     gotoxy(96, 1) ;
1161     printf("Akhyar Ahmed") ;
1162
1163     do {
1164         gotoxy(20, 3);
1165         printf("===== GENERAL STORE MANAGEMENT SYSTEM =====\n");
1166         gotoxy(20, 4);
1167         printf("\t *****");
1168         gotoxy(35, 7) ;
1169         printf("DEVELOPED BY M.OBAID");
1170         gotoxy(25, 10);
1171         printf("1. New Customer Shopping\n");
1172         gotoxy(25, 12);
1173         printf("2. Existing Customer Shopping\n");
1174         gotoxy(25, 14);
1175         printf("3. Admin Menu\n");
1176         gotoxy(25, 16);
1177         printf("0. Exit\n");
1178         gotoxy(25, 18);
1179         printf("\nEnter your choice: ");
1180         scanf("%d", &choice);
1181         fflush(stdin) ; // Used flush buffer where necessary to remove white spaces or new lines wrongly given in integer to avoid code breakage
1182     } while(choice < 0 || choice > 3);

```

Admin Menu:

Admin menu first authenticate whether, the user put right info(Username, admin) then, it gave options to user to manage inventory, manage customers, manage discounts, etc.

Then redirect them to their respective functions.

```

714 void adminMenu(void) {
715     char username[50];
716     char password[50];
717     int choice;
718
719     system("cls");
720     gotoxy(20,5);
721     printf("====Authentication For Admin====");
722     gotoxy(18,6);
723     printf("*****\n");
724     gotoxy(24,8);
725     printf("Enter Admin Username: ");
726     fgets(username, sizeof(username), stdin) ;
727     username[ strcspn( username, "\n" ) ] = '\0';
728     fflush(stdin);
729     gotoxy(24,10);
730     printf("Enter Admin Password: ");
731
732     for (int i = 0; i < 50; i++) {
733         char ch = getch();
734         if (ch != 13) { // If character is not ENTER KEY (\r For Conio) then
735             password[i] = ch;
736             ch = '*';
737             printf("%c", ch); // Visually print start but first store in password
738         }
739         else {
740             password[i] = '\0' ;
741             break;
742         }

```

```

748     if (authenticateAdmin(username, password)) {
749         system("cls");
750         gotoxy(10,3);
751         printf("\033[1;32m====Authentication successful! Welcome, Admin====\033[0m\n");
752         do {
753             gotoxy(20,5);
754             printf("====Admin Menu====");
755             gotoxy(20,7);
756             printf("1. Manage Inventory");
757             gotoxy(20,9);
758             printf("2. Manage Customers\n");
759             gotoxy(20,11);
760             printf("3. Manage Discounts\n");
761             gotoxy(20,13);
762             printf("4. Change Admin Credentials\n");
763             gotoxy(20,15);
764             printf("5. Exit Admin Menu\n");
765             gotoxy(20,17);
766             printf("Enter your choice: ");
767             scanf("%d", &choice);
768             fflush( stdin ) ;
769

```

Manage Inventory:

In this section, Admin can manage inventory, he/she can add items, remove items, update items, also can see whole inventory, etc.

```
void manageInventory(void) {
    int choice;
    do {
        gotoxy(15,3);
        printf("=====Inventory Management=====\\n");
        gotoxy(20,5);
        printf("1. Add Item\\n");
        gotoxy(20,7);
        printf("2. Remove Item\\n");
        gotoxy(20,9);
        printf("3. Update Item Quantity\\n");
        gotoxy(20,11);
        printf("4. Display Inventory\\n");
        gotoxy(20,13);
        printf("0. Back to Admin Menu\\n");
        gotoxy(20,15);
        printf("Enter your choice: ");|
        scanf("%d", &choice);
        fflush( stdin ) ;
    }
```

Manage Customers:

In this section, Admin can manage Customers, he/she can add customers, remove customers, also can Display customers, etc.

```
void manageCustomers(void) {
    int choice;
    do {
        gotoxy(15,3);
        printf("=====Customer Management=====");
        gotoxy(20,6);
        printf("1. Add Customer\\n");
        gotoxy(20,8);
        printf("2. Remove Customer\\n");
        gotoxy(20,10);
        printf("3. Display Customers\\n");
        gotoxy(20,12);
        printf("0. Back to Admin Menu\\n");
        gotoxy(20,14);
        printf("Enter your choice: ") ;
        scanf("%d", &choice);
        fflush(stdin) ;
    }
```

Manage Discounts:

In this section, Admin can manage Discounts, he/she can add discounts, remove discounts, also can see whole discount list, etc.

```
void manageDiscounts(void) {
    int choice;
    do {
        gotoxy(12,2);
        printf("====Discount Management====");
        gotoxy(20,4);
        printf("1. Add Discount\n");
        gotoxy(20,6);
        printf("2. Remove Discount\n");
        gotoxy(20,8);
        printf("3. Display Customer Discount List\n");
        gotoxy(20, 10);
        printf("0. Back to Admin Menu\n");
        gotoxy(20,12);
        printf("Enter your choice: ");
        scanf("%d", &choice);
        fflush( stdin ) ;
    } while(choice != 0);
}
```

Change Admin Cardinals:

It change the admin Details like, username, password, etc.


```

void changeAdminKeys( void ) {
    char existingPass[50] ;
    char newUsername[50] ;
    char newPassword[50] ;
    gotoxy( 20, 4 );
    printf("Enter the previous password for admin : ") ;

    for (int i = 0; i < 49; i++) { // Limiting input to 49 characters to avoid buffer overflow
        char ch = getch() ;
        if (ch != 13) {
            existingPass[i] = ch;
            printf("*"); // Masking the input
        }
        else {
            existingPass[i] = '\0'; // Null-terminate the password string (To avoid Buffer overflow)
            break;
        }
    }

    gotoxy( 0 , 7 );
    printf("PLEASE WAIT!!\n\n\t\t\t\033[1;33;5mVALIDATING CREDENTIALS...\033[0m\n") ;
    Sleep(2250) ;
    if ( strcmp (existingPass, adminUser.password) == 0 ) {
        gotoxy(15, 9) ;
        printf("\033[1;31mNote:-\033[0mChange Password At your own risk.\n") ;
        gotoxy(15, 11) ;
        printf("Enter new admin username: ");
        fgets(newUsername, sizeof(newUsername), stdin ) ;
        newUsername[ strcspn(newUsername, "\n") ] = '\0' ;
    }
}

```

New Customers:

In old Customer Section, It first collect the information from user than store his data in the customer list then redirect it to Shopping function.

```

1184 case 1:
1185     system("cls");
1186     printf("\n\n!!CREATING NEW CUSTOMER ACCOUNT!!");
1187     newCustomer.id = customerCount + 1;
1188     printf("\n\nEnter customer name: ");
1189     fgets(newCustomer.name, sizeof(newCustomer.name), stdin);
1190     newCustomer.name[ strcspn( newCustomer.name, "\n" ) ] = '\0';
1191     printf("\n\nEnter customer phone number: ");
1192     fgets(newCustomer.phoneNumber, sizeof(newCustomer.phoneNumber), stdin);
1193     newCustomer.phoneNumber[ strcspn( newCustomer.phoneNumber, "\n" ) ] = '\0';
1194     fflush( stdin );
1195     printf("\n\nSet PIN for customer authentication: ");
1196     scanf("%d", &newCustomer.pin);
1197     fflush( stdin );
1198
1199     for(int i = 0; i < customerCount; ++i) {
1200         if( strcmp( newCustomer.phoneNumber, customers[i].phoneNumber ) == 0 ) {
1201             gotoxy(15, 18);
1202             // ANSI escape code for red text
1203             printf("\033[1;31m%s Phone Number is already registered.\n\t\t\t\t\tPlease Try Again!\033[0m\n", newCustomer.phoneNumber );
1204             return 1;
1205         }
1206     }
1207
1208     system("cls");
1209     printf("PLEASE WAIT....\n\nYOUR DATA IS BEING PROCESSED....");
1210     Sleep( 1500 );
1211
1212     gotoxy(30, 10);
1213
1214     printf("ACCOUNT CREATED SUCCESSFULLY....");
1215     gotoxy(0, 20);
1216     addCustomer(newCustomer);
1217     printf("Press enter to login");
1218
1219     getch();
1220     // Perform shopping for the new customer
1221     system("cls");
1222     shopping(newCustomer);
1223     break;

```

Old Customer:

In old Customer Section, It first collect the information from user than authenticate the data whether user is an old customer or not, if user's data found in the customer list then redirect it to Shopping function.

```

case 2:
    system("cls");
    printf("\n\n!!LOGGING IN CURRENT CUSTOMER!!");
    printf("\n\nEnter customer phone number: ");
    fgets(customerPhoneNum, sizeof(customerPhoneNum), stdin);
    customerPhoneNum[ strlen( customerPhoneNum ) ] = '\0';
    fflush( stdin );
    printf("\n\nEnter PIN for authentication: ");
    scanf("%d", &pin);
    fflush( stdin );

    // Authenticate existing customer
    int customerIndex = -1;
    for (int i = 0; i < customerCount; ++i) {
        if ( ( strcmp ( customers[i].phoneNumber , customerPhoneNum ) == 0 ) && customers[i].pin == pin) {
            customerIndex = i;
            break;
        }
    }

    system("cls");
    printf("PLEASE WAIT...\n\nFETCHING ACCOUNT DETAILS....");
    Sleep( 1500 );
    if (customerIndex != -1) {
        gotoxy(30, 10);
        printf("\033[1;32mAuthentication successful! Welcome back, %s.\033[0m\n", customers[customerIndex].name);
        gotoxy(0, 20);
        printf("Enter any key to login ...\n");
        getch();
        system("cls");
        // Perform shopping for the existing customer
        shopping(customers[customerIndex]);
    }
    else {
        system("cls");
        gotoxy(0, 21);
        printf("\033[1;31mAuthentication failed! Access denied.\033[0m\n");
    }
    break;

```

Shopping Function:

The shopping function display the user options like, display whole inventory, display section wise inventory, Add items to Cart, Remove Items from Cart, Display Cart, Checkout and exit shopping.

When user select any option then it perform that task.

```

854 // Function for shopping
855 void shopping(struct Customer customer) {
856     int choice;
857     int customerId = customer.id;
858     double discount = getDiscount(customerId); // Get customer's discount
859     struct Item cart[MAX_ITEMS]; // Array to hold items in the cart
860     int cartItemCount = 0; // Variable to track the number of items in the cart
861     char *NewCustomer = customer.name ;
862
863     do {
864         gotoxy(25, 3);
865         printf("Shopping-Menu:\n");
866         gotoxy(25, 4);
867         printf("_____") ;
868         gotoxy( 20, 7 ) ;
869         printf("1. Display Whole-Inventory\n");
870         gotoxy( 20, 9 ) ;
871         printf("2. Display Section Wise Items\n") ;
872         gotoxy( 20, 11 ) ;
873         printf("3. Add Item to Cart\n");
874         gotoxy( 20, 13 ) ;
875         printf("4. Remove Item from Cart\n");
876         gotoxy( 20, 15 ) ;
877         printf("5. Display Cart\n");
878         gotoxy( 20, 17 ) ;
879         printf("6. Checkout\n");
880         gotoxy( 20, 19 ) ;
881         printf("0. Exit Shopping\n");
882         gotoxy( 20, 21 ) ;
883         printf("\nEnter your choice: ");
884         scanf("%d", &choice);
885         fflush(stdin);
886

```

Display Inventory:

It display all the items currently available in the inventory.

```

switch (choice) {
    case 1:
        system("cls") ;
        displayInventory();
        // 33 for yellow color and 5 for blinking effect
        printf("\n\033[1;33;5mPress any key to exit viewing.\033[0m\n") ;
        getch( ) ;
        system("cls") ;
        break;
    case 2:

```

Display section wise inventory:

It gives the user options of different sections in the inventory (like, Dairy, grains, beverages, snacks, etc.) If user select any category it shows the items available in that Category.

```
case 2: {
    system("cls") ;
    int category_choice ;
    gotoxy( 10, 1 ) ;
    printf("Section-Wise Inventory\n") ;
    gotoxy( 10, 2 ) ;
    printf("_____ \n\n") ;
    printf("1. Dairy\n\n") ;
    printf("2. Grains_and_cooking_products\n\n") ;
    printf("3. Snacks\n\n") ;
    printf("4. Beverages\n\n") ;
    printf("5. Others Section\n\n") ;
    printf("Enter the option_number: ") ;
    scanf("%d", &category_choice ) ;
    fflush( stdin ) ;
```

Add items to Cart:

It ask user to enter the Id number of item and quantity and if, the Id number to any item in the product list, and user's desired quantity available in the inventory than, it add that item in the Cart and display the details.

```

959 case 3: // Can declare variables in case-switch with delimiters
960     char itemId[25];
961     int quantity;
962     printf("\nEnter item ID to add to cart: ");
963     fgets( itemId, sizeof(itemId), stdin );
964     itemId[ strcspn( itemId, "\n" ) ] = '\0';
965
966     printf("\nEnter quantity: ");
967     scanf("%d", &quantity);
968     fflush( stdin );
969     // Find the item in inventory
970     int itemIndex = -1;
971     for (int i = 0; i < itemCount; ++i) {
972         if ( strcmp ( inventory[i].id , itemId ) == 0 ) {
973             itemIndex = i;
974             break;
975         }
976     }
977
978     if (itemIndex != -1 && inventory[itemIndex].quantity >= quantity) {
979         double totalPrice;
980         if ( discount > 0 ) {
981             // Calculate discounted price for existing customer
982             double discountedPrice = inventory[itemIndex].price * (1.0 - (discount / 100.0));
983             totalPrice = discountedPrice * quantity;
984         }
985         else {
986             // Regular price for new customers (no discount)
987             totalPrice = inventory[itemIndex].price * quantity;
988         }
989
990         // Add item to the cart
991         cart[cartItemCount] = inventory[itemIndex];
992         cart[cartItemCount].quantity = quantity;
993         cartItemCount++;
994
995         // Display item details and total price
996         printf("\nAdded to Cart:\n");
997         printf("Item: %s | Quantity: %d | Total Price: %.21f\n", inventory[itemIndex].name, quantity, totalPrice);
998         getch( '\n' );

```

Remove Items from Cart:

It ask user to enter the Id number of item and if, the Id number match to any item in the cart, it remove that item.

```

1012     case 4: {
1013         if (cartItemCount == 0) {
1014             system("cls");
1015             printf("\n\033[1;31mCart is empty. Unable to remove.\033[0m\n");
1016         }
1017         else {
1018             char itemIdToRemove[25];
1019             printf("\nEnter item ID to remove from cart: ");
1020             fgets(itemIdToRemove, sizeof(itemIdToRemove), stdin);
1021             itemIdToRemove[strcspn(itemIdToRemove, "\n")] = '\0';
1022
1023             int removeIndex = -1;
1024             for (int i = 0; i < cartItemCount; ++i) {
1025                 if (strcmp(cart[i].id, itemIdToRemove) == 0) {
1026                     removeIndex = i;
1027                     break;
1028                 }
1029             }
1030
1031             system("cls");
1032             if (removeIndex != -1) {
1033                 // Shift elements to remove the specified item from the cart
1034                 for (int i = removeIndex; i < cartItemCount - 1; ++i) {
1035                     cart[i] = cart[i + 1];
1036                 }
1037                 cartItemCount--;
1038
1039                 printf("\n\033[1;32m%s-Item removed from cart successfully.\033[0m\n", itemIdToRemove);
1040             }
1041             else {
1042                 printf("\n\033[1;31m%s Item not found in the cart.\033[0m\n", itemIdToRemove);
1043             }
1044         }
1045         break;
1046     }

```

Display Cart:

It Display the items in the Cart with all Details.

```

1048 case 5: {
1049     if (cartItemCount == 0) {
1050         printf("\n\n\033[1;31mCart is empty.\033[0m\n");
1051     }
1052     else {
1053         int row = 29 ;
1054         gotoxy( 55, 25 ) ;
1055         printf("Cart Contents:\n");
1056         gotoxy( 55, 26 ) ;
1057         printf("_____\n");
1058         gotoxy( 45, row ) ;
1059         printf("ID      |   Name      |   Price   | Quantity\n");
1060         double totalCartPrice = 0.0;
1061         for (int i = 0; i < cartItemCount; ++i) {
1062             gotoxy( 45, ++row ) ;
1063             double itemPrice ;
1064             if ( discount > 0 ) {
1065                 double discountedPrice = cart[i].price * (1.0 - (discount / 100.0));
1066                 itemPrice = discountedPrice * cart[i].quantity ;
1067                 printf("%-6s | %-12s | %-7.2lf | %-3d\n", cart[i].id, cart[i].name, itemPrice, cart[i].quantity);
1068                 totalCartPrice += itemPrice ;
1069             }
1070             else {
1071                 itemPrice = cart[i].price * cart[i].quantity;
1072                 printf("%-6s | %-12s | %-7.2lf | %-3d\n", cart[i].id, cart[i].name, cart[i].price, cart[i].quantity);
1073                 totalCartPrice += cart[i].price ;
1074             }
1075         }
1076         printf("\033[1;33;5mTotal Cart Price: %.2lf\nPress any key to move back.\033[0m\n", totalCartPrice) ;
1077         getch( ) ;
1078         system("cls") ;
1079     }
1080     break;
1081 }

```

Checkout:

It Display the items in the Cart with all Details and display the total payable amount then complete checkout process.

```

case 6: {
    system("cls") ;
    if (cartItemCount == 0) {
        printf("\033[1;31mCart is empty. Unable to checkout.\033[0m\n");
    }
    else {
        int row = 5 ;
        printf("\nCheckout Process:\n");
        printf("\nItems Purchased are:\n");
        gotoxy( 15, row ) ;
        printf("ID      |   Name      |   Price   | Quantity\n");
        double totalCheckoutPrice = 0.0;
        double checkoutPrices[cartItemCount] ;
        for (int i = 0; i < cartItemCount; ++i) {
            gotoxy( 15 , ++row ) ;
            if ( discount > 0 ) {
                double discountedPrice = cart[i].price * (1.0 - (discount / 100.0));
                checkoutPrices[i] = discountedPrice * cart[i].quantity ;
                printf("%-6s | %-12s | %-7.2lf | %-3d\n", cart[i].id, cart[i].name, checkoutPrices[i], cart[i].quantity);
            }
            else {
                checkoutPrices[i] = cart[i].price * cart[i].quantity;
                printf("%-6s | %-12s | %-7.2lf | %-3d\n", cart[i].id, cart[i].name, cart[i].price, cart[i].quantity);
            }
            totalCheckoutPrice += checkoutPrices[i] ;
        }
        gotoxy(0 , ++row ) ;
        if( discount > 0 )
            printf("\n\033[1;33;5mTotal Checkout Price(With %1f%%-Discount): %.2lf\033[0m\n",discount, totalCheckoutPrice) ;
        else
            printf("\n\033[1;31mTotal Checkout Price: %.2lf\033[0m\n", totalCheckoutPrice) ;

        // Perform checkout - Reset the cart
        gotoxy(0 , ++row ) ;
        printf("\n\033[1;33;5mCheckout completed. Thanks you for shopping!\nWe hope to see you again soon!\033[0m(Regards Admin Obaid)\n");
        getch( ) ;
        system("cls") ;
    }
}

```


Tools used:

Visual Studio Code + C