8.0-Classes and Objects

Program

```
using System;


namespace ShoppingCart
{
    internal class Cart
    {
        private string cartOwner;
        private int maxItems;
        private int itemCount = 0;


        public Cart(string owner, int maxItems)
        {
            cartOwner = owner;
            this.maxItems = maxItems;
            Console.WriteLine($"Shopping cart for '{cartOwner}' is created.");
        }


        // Getter and Setter for Cart Owner
        public string CartOwner
        {
            get { return cartOwner; }
            set { cartOwner = value; }
        }
        // Method to add an item to the cart
        public void AddItem(string itemName)
        {
            if (itemCount < maxItems)
            {
                itemCount++;
                Console.WriteLine($"Item '{itemName}' added to the shopping cart.");
            }
            else
            {
                Console.WriteLine("Shopping cart is full. Cannot add more items.");
            }
        }

        // Method to display all items in the cart
        public void DisplayItems()
        {
            Console.WriteLine($"Items in '{cartOwner}' shopping cart: '{itemCount}'");
        }

        // Destructor
        ~Cart()
        {
            Console.WriteLine($"Shopping cart for '{cartOwner}' is being destroyed.");
        }
    }
}
```

```
using System;

namespace ShoppingCart
{
    internal class Program
    {
        static void Main(string[] args)
        {
            Console.Write("Enter the owner's name: ");
            string ownerName = Console.ReadLine();

            Console.Write("Enter the maximum number of items in the cart: ");
            int maxItems = int.Parse(Console.ReadLine());

            Cart myCart = new Cart(ownerName, maxItems);

            Console.WriteLine("\nEnter item names:");
            do
            {
                string input = Console.ReadLine();
                myCart.AddItem(input);
                maxItems--;
            } while (maxItems >= 0);

            myCart.DisplayItems();
        }
    }
}
```

Exercise

Write a C# program that defines two classes Cart and Program.

The Cart class encapsulates the properties and behavior of a shopping cart.

It has private fields for storing the cart owner's name (cartOwner), the maximum number of items allowed in the cart (maxItems), and the current count of items in the cart (itemCount).

The constructor Cart(string owner, int maxItems) initializes these fields when a new Cart object is created. It also displays a message indicating the creation of a new shopping cart.

The CartOwner property provides getter and setter methods for accessing and modifying the cart owner's name.

The AddItem(string itemName) method adds an item to the cart if the maximum item limit has not been reached. It increments the itemCount and prints a message indicating the addition of the item.

If the cart is already full, it prints a message stating that no more items can be added.

The DisplayItems() method prints the total number of items in the cart along with the cart owner's name.

The destructor (~Cart()) is invoked when the Cart object is destroyed and prints a message indicating the destruction of the shopping cart.

The Program class contains the Main method, which serves as the entry point of the program.

It prompts the user to enter the owner's name and the maximum number of items allowed in the cart.

It creates a new Cart object (myCart) with the provided information.

It enters a loop where the user can input item names to add to the cart until the maximum number of items is reached.

For each item added, it calls the AddItem method of the Cart object (myCart).

After exiting the loop, it calls the DisplayItems method to display the total number of items in the cart.

Hint

It prompts the user to input the owner's name and the maximum number of items allowed in the cart.

It then allows the user to add items to the cart and displays the current count of items in the cart.

Finally, it demonstrates the functionality of the shopping cart by adding items and displaying the count of items in the cart.

Explanation

It consists of two classes: Cart and Program.

The Cart class represents a shopping cart and includes fields for the cart owner's name (cartOwner), the maximum number of items allowed in the cart (maxItems), and the current count of items in the cart (itemCount). It has a constructor to initialize these fields and display a message indicating the creation of a new shopping cart. Additionally, it includes methods to add items to the cart (AddItem) and display the number of items in the cart (DisplayItems). There's also a destructor that prints a message when the shopping cart object is destroyed.

The Program class contains the Main method, which serves as the entry point of the program. It prompts the user to input the owner's name and the maximum number of items allowed in the cart. Then, it creates a new Cart object with the provided information. After that, it enters a loop where the user can input item names to add to the cart until the maximum number of items is reached. For each item added, it calls the AddItem method of the Cart object. Finally, it displays the total number of items in the cart by calling the DisplayItems method.