Project Requirements and Objectives

Objectives

The goal of this project is to develop a simple **console-based Inventory Management System** that allows users to efficiently manage product stock. The system should provide an intuitive interface for users to **add, update, view, and remove products** from the inventory.

Functional Requirements (What the system should do)

1. **Add New Products**
    - Users can add products with the following details:
        - Name
        - Price
        - Stock quantity
2. **Update Stock Levels**
    - Users can increase stock when restocking products.
    - Users can decrease stock when products are sold.
3. **View Products**
    - Users can list all available products, showing:
        - Product Name
        - Price
        - Stock Quantity
4. **Remove Products**
    - Users can delete a product from the inventory when it is no longer needed.
5. **Error Handling**
    - Prevent invalid input (e.g., negative stock values, empty product names).
    - Notify the user when attempting to update or remove a non-existing product.

Non-Functional Requirements (How the system should perform)

1. **Usability**
    - The system should be easy to use with clear prompts and instructions.
    - Provide meaningful error messages and confirmations.

2. **Performance**
    - The system should respond quickly to user input.
3. **Scalability**
    - The system should allow for an increasing number of products without performance degradation.
4. **Reliability**
    - Ensure data consistency when updating stock levels.
    - Prevent accidental data loss or incorrect product modifications.
5. **Maintainability**
    - The code should be well-structured, easy to read, and documented for future improvements.

Here's a high-level design outline for your **Inventory Management System** in **C#**, including a flowchart and task breakdown.

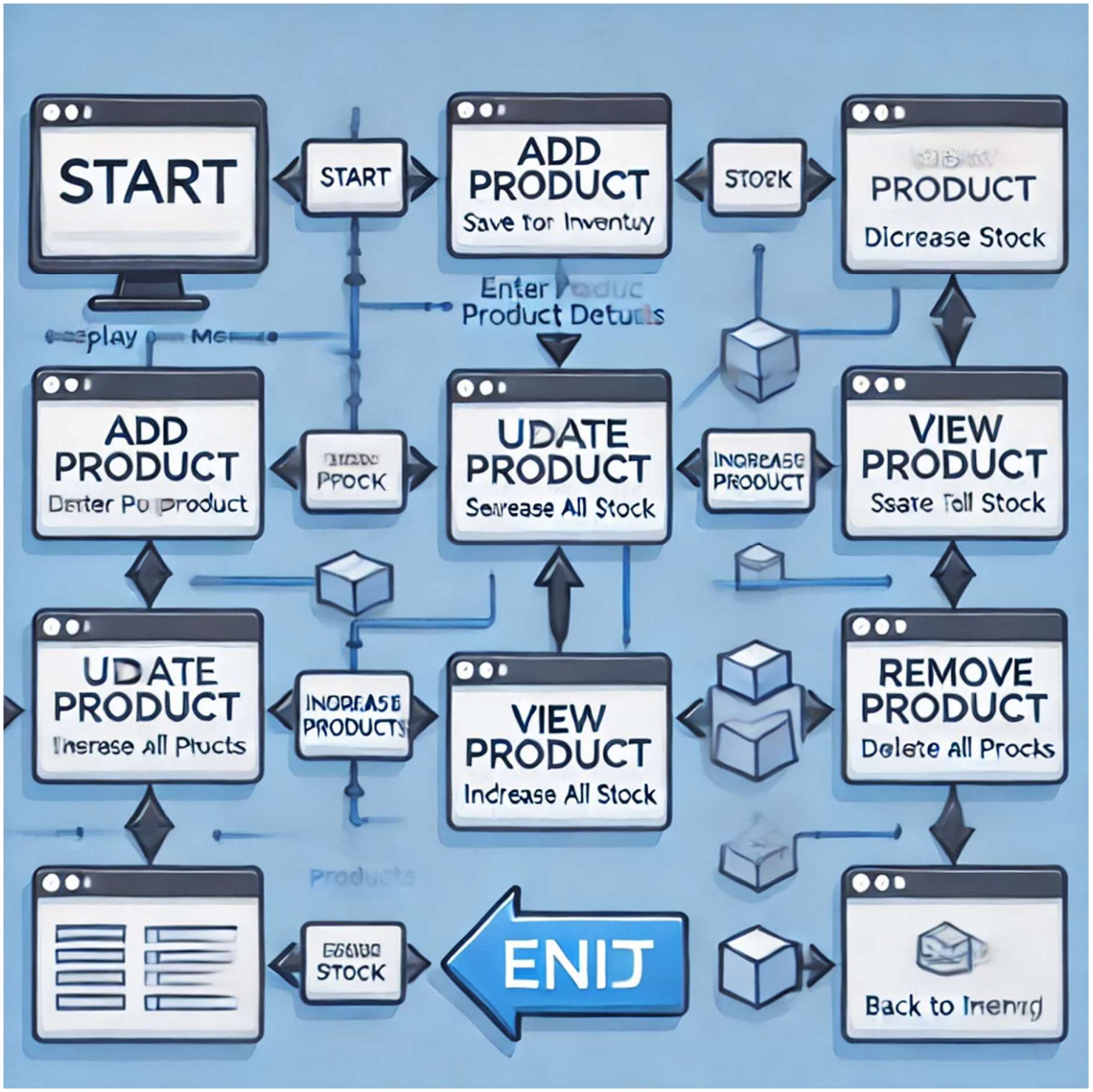
Flowchart

I'll generate a flowchart that represents the main interactions of the system.

Process Flow:

1. Start
2. Display Main Menu
3. User selects an action:
    - **Add Product** → Enter product details → Save to inventory
    - **Update Stock** → Choose product → Increase/Decrease stock
    - **View Products** → Display all products
    - **Remove Product** → Choose product → Delete from inventory
4. Return to the Main Menu or Exit.

Here's the flowchart for your **Inventory Management System in C#**. It visually represents the key processes and decisions. Let me know if you need any modifications!



Task Breakdown & Code Components

1. **Project Setup**
    - Create a new C# Console Application.
    - Set up a Product class to store product details.
2. **Main Menu Display**
    - Use a while loop to show the menu options.
    - Read user input and call the appropriate function.
3. **Adding a Product**
    - Prompt the user for **name, price, and stock quantity**.

- Store the product in a **List** or a dictionary.

4. **Updating Stock**
   - Search for a product by name or ID.
   - Increase or decrease stock based on user input.
5. **Viewing Products**
   - Loop through the product list and display details.
6. **Removing a Product**
   - Search for a product by name or ID.
   - Remove it from the list.
7. **Error Handling**
   - Prevent invalid inputs (e.g., negative stock values, empty product names).
   - Handle cases where the product doesn't exist.

Code:

```
using System;
using System.Collections.Generic;

class Product
{
    public string Name { get; set; }
    public double Price { get; set; }
    public int Stock { get; set; }

    public Product(string name, double price, int stock)
    {
        Name = name;
        Price = price;
        Stock = stock;
    }
```

```
}

class Program
{
    static List<Product> inventory = new List<Product>();

    static void Main()
    {
        while (true)
        {
            Console.WriteLine("\nInventory Management System");
            Console.WriteLine("1. Add Product");
            Console.WriteLine("2. Update Stock");
            Console.WriteLine("3. View Products");
            Console.WriteLine("4. Remove Product");
            Console.WriteLine("5. Exit");
            Console.Write("Choose an option: ");

            string choice = Console.ReadLine();
            switch (choice)
            {
                case "1": AddProduct(); break;
                case "2": UpdateStock(); break;
                case "3": ViewProducts(); break;
                case "4": RemoveProduct(); break;
                case "5": return;
                default: Console.WriteLine("Invalid choice. Try again."); break;
            }
        }
```

```
}

static void AddProduct()
{
    Console.Write("Enter product name: ");
    string name = Console.ReadLine();
    Console.Write("Enter product price: ");
    double price = Convert.ToDouble(Console.ReadLine());
    Console.Write("Enter stock quantity: ");
    int stock = Convert.ToInt32(Console.ReadLine());

    inventory.Add(new Product(name, price, stock));
    Console.WriteLine("Product added successfully!");
}

static void UpdateStock()
{
    Console.Write("Enter product name to update: ");
    string name = Console.ReadLine();
    Product product = inventory.Find(p => p.Name.ToLower() == name.ToLower());

    if (product != null)
    {
        Console.Write("Enter new stock quantity: ");
        product.Stock = Convert.ToInt32(Console.ReadLine());
        Console.WriteLine("Stock updated successfully!");
    }
    else
    {
```

```
            Console.WriteLine("Product not found!");
        }
    }

    static void ViewProducts()
    {
        Console.WriteLine("\nCurrent Inventory:");
        foreach (var product in inventory)
        {
            Console.WriteLine($"Name: {product.Name}, Price: {product.Price:C}, Stock: {product.Stock}");
        }
    }

    static void RemoveProduct()
    {
        Console.Write("Enter product name to remove: ");
        string name = Console.ReadLine();
        Product product = inventory.Find(p => p.Name.ToLower() == name.ToLower());

        if (product != null)
        {
            inventory.Remove(product);
            Console.WriteLine("Product removed successfully!");
        }
        else
        {
            Console.WriteLine("Product not found!");
        }
    }
```

}