Project – Custom Ice Cream Builder Program

**Project:** **Custom Ice Cream Builder Program Specification**

**Objective:**  
Develop a program that allows users to design a custom ice cream sundae. The program will simulate the process of selecting a base ice cream flavor, toppings, and sauces, while respecting certain constraints (e.g., maximum toppings). The program must ensure that the order is logically structured and clearly presented.

**Specifications:**

1. **Program Functionality:**
   * The program must ask the user to choose a base ice cream flavor (e.g., Vanilla, Chocolate, or Strawberry).
   * Users can then select toppings and sauces from a predefined list. Each topping or sauce has a maximum allowed quantity.
   * After each selection, the program must confirm the choice and ask whether the user wishes to add another item.
2. **Constraints:**
   * A sundae can contain a maximum of 6 ingredient items on the ingredient list.
   * Only 1 sauce type can be chosen, and its quantity is capped at 2 servings.
   * The user must finalize the sundae by confirming the choices.
3. **Output:**
   * The program will display a clear summary of the chosen ingredients, their quantities, and instructions for assembling the sundae.

**Ice Cream Ingredients:**

| **Item** | **Category** | **Measure** | **Max Quantity** |
| --- | --- | --- | --- |
| Vanilla | Ice Cream Base | Scoop | 3 |
| Chocolate | Ice Cream Base | Scoop | 3 |
| Strawberry | Ice Cream Base | Scoop | 3 |
| Sprinkles | Topping | Tablespoon | 3 |
| Crushed Oreos | Topping | Tablespoon | 3 |
| Cherries | Topping | Piece | 5 |
| Hot Fudge | Sauce | Spoonful | 2 |
| Caramel Sauce | Sauce | Spoonful | 2 |

**Implementation Notes:**

1. **Programming Requirements:**
   * Use a Console Application in the programming language you are learning.
   * Incorporate functions or methods to handle input, validation, and output.
   * Allow error detection and provide feedback for invalid inputs (e.g., exceeding maximum quantities).
2. **Output Example:**

Base: Vanilla (2 scoops)

Toppings: Sprinkles (2 tbsp), Cherries (3 pcs)

Sauce: Hot Fudge (2 spoonfuls)

**Assembling: Assemble by layering the base, adding toppings, finishing with sauce. Serve immediately.**

**Submission Requirements**:

* **Program Documentation**: Ensure your submission includes comprehensive documentation covering all phases of the project:
  + **Analysis**: Describe the problem the program solves.
  + **Design**: Provide details on how the program was planned, including flowcharts or UML diagrams if applicable.
  + **Coding**: Submit well-commented code for clarity.
  + **Testing**: Include a thorough test plan with scenarios such as invalid inputs, exceeding maximum allowed items, missing required items, out-of-range values, duplicate entries, and graceful handling of program flow and exits.
  + **Screen Captures**: Attach screenshots demonstrating the program in action, including successful execution and error handling.
* **Group Project Submission**: Only one group member should upload the final project file to Canvas for grading. Ensure it is the most up-to-date and complete version of the project.
* Sample Ice Cream Builder Program Runtime

A screenshot of a computer program

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* Sample Ice Cream Builder Runtime (continued)

A screenshot of a computer

AI-generated content may be incorrect.