

Scenario: The Magical Vegetarian Recipe Generator

You're a wizard chef in a fantasy world, and you run a magical kitchen specializing in vegetarian dishes. In this kitchen, recipes are living beings that can interact with each other and possess various magical properties. Your task is to develop a system that allows you to create, modify, and manage these vegetarian recipes using Object-Oriented Programming (OOP) principles.

OOP Concepts to Apply:

1. **Classes & Objects**
2. **Inheritance**
3. **Polymorphism**
4. **Abstraction**

Task Breakdown:

Step 1: Create the Base Class - **Ingredient**

- **Objective:** Define a class called **Ingredient** that has attributes like **name**, **quantity**, **unit**, and a unique magical property (such as **spiciness**, **sweetness**, or **bitterness**).
- **Twist:** Since this is a vegetarian dish, make sure that the **Ingredient** class includes an attribute indicating if the ingredient is a vegetable or spice.

Step 2: Create Derived Classes - **Vegetable** and **Spice**

- **Objective:** Using inheritance, create classes **Vegetable** and **Spice** that inherit from the **Ingredient** class.
- **Twist:** Each derived class should have an additional attribute unique to it, such as **color** for **Vegetable** and **heatLevel** for **Spice**. These classes should override a method called **describe()** to provide a detailed description of the ingredient, including its magical properties.

Step 3: Encapsulate Recipe Logic in a **Recipe** Class

- **Objective:** Create a **Recipe** class that holds a list of **Ingredient** objects. Include methods to add ingredients, remove ingredients, and adjust quantities.
- **Twist:** The **Recipe** class should also have a method called **castSpell()** that magically transforms the dish based on the combination of ingredients (e.g., a mix of sweet and spicy vegetables could result in a dish with a "Fiery Sweet" flavor).

Step 4: Introduce Polymorphism - Multiple Types of Vegetarian Recipes

- **Objective:** Use polymorphism to create different types of vegetarian recipes like **SaladRecipe**, **SoupRecipe**, and **StirFryRecipe**, all inheriting from **Recipe**.
- **Twist:** Each type of recipe should implement its own version of the **castSpell()** method. For instance, **SaladRecipe** might enhance the freshness and crunchiness of the vegetables, while **SoupRecipe** might merge the flavors into a harmonious broth.

Step 5: Abstract the Cooking Process

- **Objective:** Introduce an abstract class `CookingProcess` that outlines the steps of a recipe without specifying the details.
- **Twist:** Implement this abstract class in concrete classes like `BoilingProcess`, `SauteingProcess`, and `BlendingProcess`. The `Recipe` class should accept a `CookingProcess` object and execute the process accordingly.

Final Challenge:

After completing the above steps, create a full program that simulates creating and managing a `SoupRecipe` using these concepts. Demonstrate how the addition, removal, or adjustment of ingredients affects the final magical properties of the vegetarian dish.
