Ingredient class

Class definition and constructor

Constructor should initialize all member variables

class Ingredient:

def __init__(self, quantity, unit, food):
    """
    Constructor. Initialized member variables for quantity, unit, and food
    Param quantity (float): amount of ingredient
    Param unit (string): units (e.g. tablespoon, or cup)
    Param food (string): ingredient name (e.g. carrots or oil)
    Implicit returns (Ingredient): an instance of this class
    """
    self.quantity = quantity
    self.unit = unit
    self.food = food
Ingredient class - setters vs getters

setters - methods for setting member variables (aka mutators)

getters - methods for getting member variables (aka accessors)

Why use setters/getters instead of referencing member variables directly?

Ingredient defines getters for its member variables but not setters.
Ingredient class - setters vs getters

Why use setters/getters instead of referencing member variables directly?

Setters/getters help *abstract* the details of the class away from the user.

-> e.g. we can change the class implementation and the user never need know!
Interface vs implementation

The methods of class define its **interface**. The interface defines how the user interacts with the object.

The **implementation** is the body of the methods. In a good design, the user doesn’t need to understand the implementation (classes should work like a **black box**).
Ingredient class - testing

```python
if __name__ == '__main__':

    sugar = Ingredient(1, "cup", "sugar")
    flour = Ingredient(2, "cup", "flour")
    water = Ingredient(1, "tablespoon", "water")
    ingredients = [sugar, flour, water]

    # Test getQuantity here
    # Test getUnit here
    # Test getFood here
    for ingredient in ingredients:
        print(ingredient.getQuantity(1.0))
        print(ingredient.getUnit())
        print(ingredient.getFood())
        print("------")

    # Print out a half recipe
    for ingredient in ingredients:
        ingredient.display(0.5)
```
Using Ingredient from the class Recipe

Ingredients are created in the method Recipe.load. The method here prints the recipe for a desired number of servings.

Below, we test the Recipe class with lemonCupcakeRecipe.txt