### Exercise 1.2: Data Types in Python

#### Learning Goals

* Explain variables and data types in Python
* Summarize the use of objects in Python
* Create a data structure for your Recipe app

#### Reflection Questions

1. Imagine you’re having a conversation with a future colleague about whether to use the iPython Shell instead of Python’s default shell. What reasons would you give to explain the benefits of using the iPython Shell over the default one?
   1. iPython has a better user experience than Python’s default shell for a few reasons. First, it uses syntax highlighting to display different features of your code in contrasting colors and fonts. Also, the IPython shell automatically indents text for nested statements. Finally, each command is executed immediately after you type it in so you can test out small chunks of code quickly and easily.
2. Python has a host of different data types that allow you to store and organize information. List 4 examples of data types that Python recognizes, briefly define them, and indicate whether they are scalar or non-scalar.

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| **Data type** | **Definition** | **Scalar or Non-Scalar?** |
| int | integer (whole number) | Scalar |
| float | decimal number | Scalar |
| str | string of characters (numbers or letters) | Non-Scalar |
| bool | boolean True/False statement | Scalar |

1. A frequent question at job interviews for Python developers is: what is the difference between lists and tuples in Python? Write down how you would respond.
   1. Tuples and lists are both linear arrays that can store multiple values of any type but tuples are immutable and lists are mutable. Lists are useful in situations where reordering or modifications may be necessary. An advantage of tuples is being faster to read and access, especially when large amounts of data are involved.
2. In the task for this Exercise, you decided what you thought was the most suitable data structure for storing all the information for a recipe. Now, imagine you’re creating a language-learning app that helps users memorize vocabulary through flashcards. Users can input vocabulary words, definitions, and their category (noun, verb, etc.) into the flashcards. They can then quiz themselves by flipping through the flashcards. Think about the necessary data types and what would be the most suitable data structure for this language-learning app. Between tuples, lists, and dictionaries, which would you choose? Think about their respective advantages and limitations, and where flexibility might be useful if you were to continue developing the language-learning app beyond vocabulary memorization.
   1. A good data structure would be a dictionary because you have to have multiple strings attached to one vocab word. The word, definition and category are all strings. The vocab word dictionaries can be stored in a list.