Beyond the Textbook (Zelle 4e - Chapter 7)

Loop Structures and Booleans

`For-In` is the preferred Python looping structure.

- It is supported by all Python **iterables**, including:
  - `str`
  - `list`
  - `tuple`
  - `range`
  - `file`
- `For-In` handles any number of items in the underlying data structure.
- It behaves appropriately even when the data structure is **empty**.

`while` is a better choice for some looping use cases

- Interacting flexibly with the user at the console
- Searching for specific content in a file.
- Processing records from a data store that does not support `For-In` (not a Python iterable)
- Simulating game play
- Controlling devices
- Writing code for graphical user interfaces

Interacting flexibly with the user at the console

- The preferred design pattern for flexible interaction using the console is the **sentinel loop**.
- See:
  - *_05_flexible_integer_adding_machine.py*
  - *_06_flexible_integer_adding_machine_using_break.py*
  - *_08_usable_integer_adding_machine.py*

Never use the `continue` statement

- We have seen that using the `break` statement in a `while` loop is a style choice.
- The `break` statement can be used in counted loops as well.
- Some programmers use the `continue` statement to jump over optional behavior located at the end of the loop.
- This is a confusing practice that creates no advantage.
- Always use the `if` statement instead.
- See:
    - *_15_never_use_the_continue_statement.py*

Searching for specific content in a file

- We will address this use case for `while` when we cover Chapter 10: Persisten Data.

Processing records from a data store that does not support `For-In`

- We will address this use case for `while` when we cover Chapter 10: Persisten Data.

Simulating game play

- Designing and building game simulation programs is good practice for designing and building complex programs.
- We will be doing this when we get to Chapter 11: Simulation and Design.
- Games continue until one player has won.
- It is a natural use case for `while`.
- See:
  - *_20_playing_a_game_using_while.py*

Controlling Devices

- Controlling electronic devices using a computer requires constant communication between the program and the device.
- Because devices are being controlled for an indefinite period, the `while` is the natural construct to use.
- See:
  - *_30_controlling_devices_using_while.py*

Writing Code for Graphical User Interfaces

- Zelle covers a Simple Event Loop in Section 7.6.
- This is a basic approach to implementing a graphical user interface using Python.
- I don't cover this because there a several competing packages for implementing graphical user interfaces in Python.
- The most common graphical user interface implemented using Python is a Web application implemented using a Web framework like Django.
- I cover Web frameworks (primarily Django) in my IS439 course.

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