

CSCA20 Week 5 Notes

Objectives:

1. Practice using loops
2. Practice writing functions that involve loops
3. Practice working with lists

For loop

- A for loop is used to iterate over a container of items. And this container can be a list, a string, a dictionary, and so on.

- 2 ways of executing for loops:

(a) looping an item by item

(b) loop over a set of indices using range()

- range function range() generates a list of numbers depending on the input parameters.

- range(x), defaults to 0 as a starting value and ends at x but not including x. Increment the sequence by 1. Eg. range(2) -> 0, 1 range(4) -> 0, 1, 2, 3

- range(x, y), x is the starting number of the sequence that generates up to but not include y.

Increment the sequence by 1. Eg. range(2, 4) -> 2, 3 range(1, 100) -> 1, 2, 3,..., 99

- range(x, y, z), x is the starting number of the sequence that generates up to but not include y. Increment the sequence by z. range(1, 11, 3) -> 1, 4, 7, 10

example (a) of looping an item by item

example (b) of looping over a set of indices using range()

Lists

- A list is a collection of python data values, where each value is identified by an index in the form [item1, item 2, ... , item n] and the length of this list is n.

- The difference between lists and strings is that list can store any data of any type.

Eg. s = ['apple', 1, True, 3.14159] is a valid list of 4 items

- len() returns the number of items stored in a list

Eg. len(s) = 4

- The index operator [] is used to access a specific item in the list. Index starts at 0.

Eg. `s[0] = 'apple'`

`s[1] = 1`

`s[2] = True`

`s[3] = 3.14159`

- `help(list)` will give a list of built-in methods you can use including `len()`

Example(find the maximum integer give a nonempty list of integers)