Web Application Development using Python

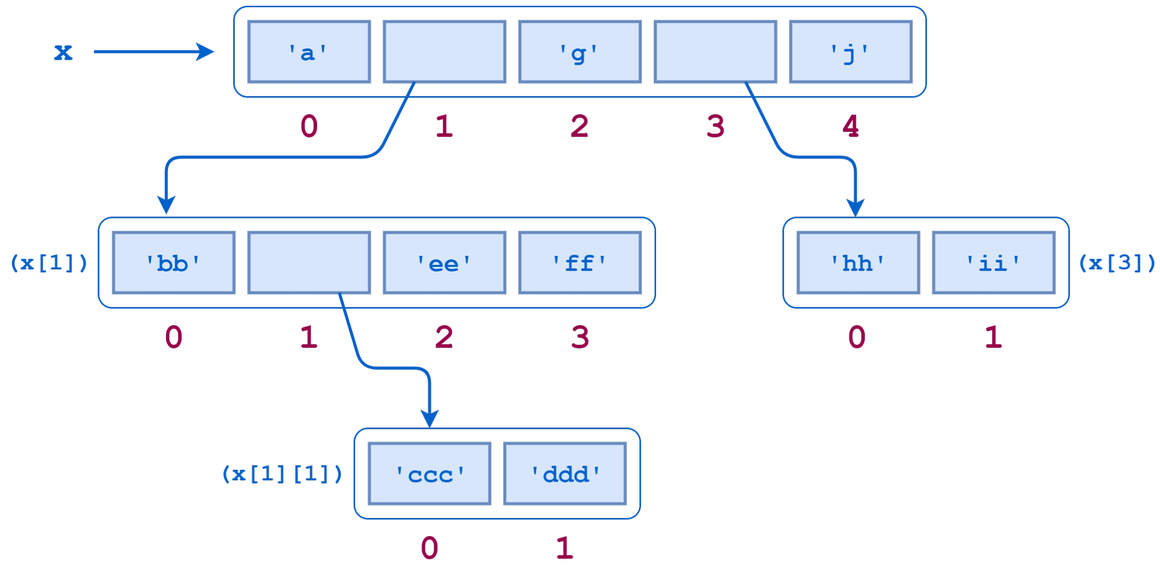
Introduction to Data Structures and Lists

Prepared by George Khoury

Outline

- **Lists**
- Tuples
- Sets
- Dictionaries

Lists



Lists

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- Lists are **mutable** sequences, typically used to store collections of similar items.
- A list can be written as a list of comma-separated values (items) between square brackets.

```
my_string = ‘Hello, world!’
print(my_string)
```

Lists

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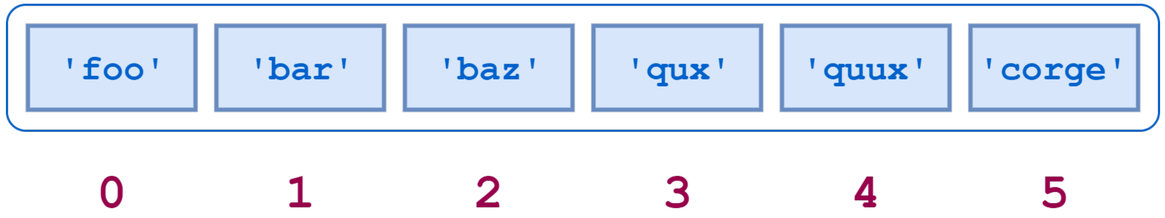
- **Declaring a list**
  - linux_distros = ['Debian', 'Ubuntu', ‘Fedora’, 'CentOS', 'OpenSUSE', 'Arch', 'Gentoo']
- **Indexing - Accessing an element**
  - linux_distros[0]
  - linux_distros[1]
- **Slicing a list**
  - another_list = linux_distros[1:2]
- **Updating an element — Lists are mutable**
  - linux_distros[0]= ‘Fedora’
  - linux_distros[1]= ‘Kali Linux’
- **Updating a slice — Lists are mutable**
  - linux_distros[2:3] = [1,1]



List operations

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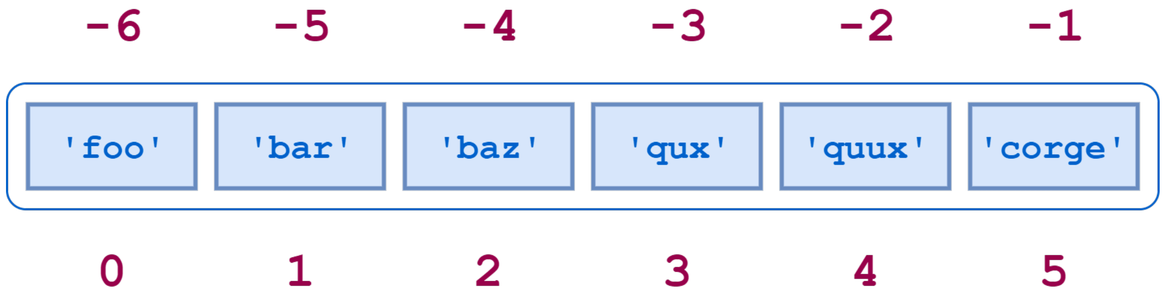
- There are many operations that can be performed with lists which makes it one of the most used data types in Python.
  - List length
  - List concatenation
  - List repetition
  - Iterating through a string
  - List membership test
  - Other built-in functions



List functions

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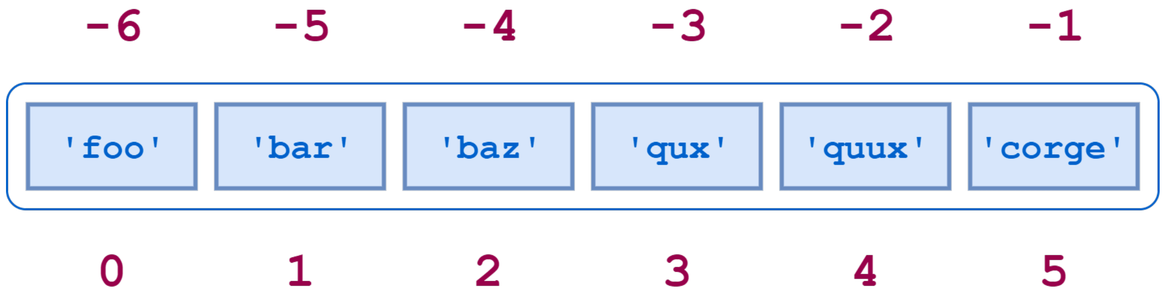
- There are numerous built-in functions available to use with lists.
- Some of the commonly used methods are
  - **len()**
  - **min(), max()**
  - **sum()**
- Additional methods can be found here.
  - https://docs.python.org/3/library/stdtypes.html#string-methods



List methods

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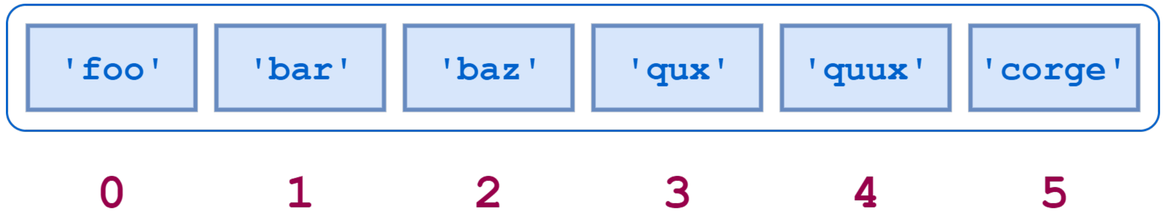
- **append(obj)** — Adds an element at the end of the list
- **clear()** — Removes all elements from the list
- **count(obj)** — Count the number of elements in the list
- **index(obj)** — Returns the index of the first occurrence of an object
- **extend(list)** — Joins lists together
- **insert(i, obj)** — Inserts **obj** at index **i**
- **remove(obj)** — Removes an element from the list
- **pop() / pop(i)**— Removes and returns the last element in the list / element at index **i**
- **reverse()** — Reverses the order of elements
- **sort()** — Sorts the list in ascending order



List methods

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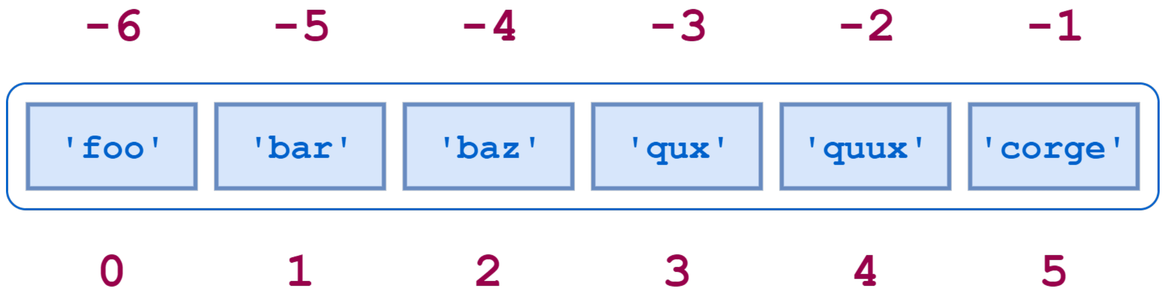
- Additional methods can be found here.
  - https://docs.python.org/3/library/stdtypes.html#lists
  - https://docs.python.org/3/tutorial/datastructures.html#more-on-lists



Resources

- https://docs.python.org/3/tutorial/introduction.html#lists
- https://docs.python.org/3/tutorial/datastructures.html#more-on-lists
- https://docs.python.org/3/tutorial/datastructures.html#tuples-and-sequences
- https://docs.python.org/3/tutorial/datastructures.html#sets
- https://docs.python.org/3/tutorial/datastructures.html#dictionaries