INTRO TO PYTHON FOR FINANCE

Lists in Python

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Lists - square brackets [ ]

```
months = ['January', 'February', 'March', 'April', 'May', 'June']
```

Python is zero-indexed

```
months = ['January', 'February', 'March', 'April', 'May', 'June']
Index:      0           1           2         3       4       5
```

Subset lists

```
months = ['January', 'February', 'March', 'April', 'May', 'June']

months[0]
'January'

months[2]
'March'
```

Negative indexing of lists

```
months = ['January', 'February', 'March', 'April', 'May', 'June']
```

```
months[-1]
```

```
'June'
```

```
months[-2]
```

```
'May'
```

Subsetting multiple list elements with slicing

Slicing syntax

```
# Includes the start and up to (but not including) the end
mylist[startAt:endBefore]
```

Example

```
months = ['January', 'February', 'March', 'April', 'May', 'June']
```

```
months[2:5]

['March', 'April', 'May']

months[-4:-1]

['March', 'April', 'May']
```

Extended slicing with lists

```
months = ['January', 'February', 'March', 'April', 'May', 'June']
```

```
months[3:]
```

```
['April', 'May', 'June']
```

```
months[:3]
```

```
['January', 'February', 'March']
```

Slicing with Steps

```
# Includes the start and up to (but not including) the end
mylist[startAt:endBefore:step]
```

```
months = ['January', 'February', 'March', 'April', 'May', 'June']

months[0:6:2]

['January', 'March', 'May']

months[0:6:3]

['January', 'April']
```

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Lists in Lists

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Lists in Lists

- Lists can contain various data types, including lists themselves.
- Example

  A nested list describing the month and its associated consumer price index

```
cpi = [['Jan', 'Feb', 'Mar'], [238.11, 237.81, 238.91]]
```

Subsetting Nested Lists

```
months = ['Jan', 'Feb', 'Mar']
print(months[1])

'Feb'
```

```
cpi = [['Jan', 'Feb', 'Mar'], [238.11, 237.81, 238.91]]

print(cpi[1])

[238.11, 237.81, 238.91]
```

More on Subsetting Nested Lists

How would one subset out a specific price index?

```
cpi = [['Jan', 'Feb', 'Mar'], [238.11, 237.81, 238.91]]

print(cpi[1])

[238.11, 237.81, 238.91]

print(cpi[1][0])

238.11
```

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Methods and functions

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Methods vs. Functions

METHODS

- All methods are functions
- List methods are a **subset** of built-in functions in Python

- Used on an object
  - `prices.sort()`

FUNCTIONS

- Not all functions are methods

- Requires an input of an object
  - `type(prices)`

List Methods - sort

- Lists have several built-in methods that can help retrieve and manipulate data
- Methods can be accessed as `list.method()`

`list.sort()` sorts list elements in ascending order

```
prices = [238.11, 237.81, 238.91]

prices.sort()

print(prices)

[237.81, 238.11, 238.91]
```

Adding to a list with append and extend

`list.append()` adds a single element to a list

```
months = ['January', 'February', 'March']

months.append('April')

print(months)

['January', 'February', 'March', 'April']
```

`list.extend()` adds each element to a list

```
months.extend(['May', 'June', 'July'])

print(months)

['January', 'February', 'March', 'April', 'May', 'June', 'July']
```

Useful list methods - index

`list.index(x)` returns the lowest index where the element x appears

```
months = ['January', 'February', 'March']
prices = [238.11, 237.81, 238.91]
```

```
months.index('February')

1
```

```
print(prices[1])

237.81
```

More functions ...

- `min(list)`: returns the smallest element
- `max(list)`: returns the largest element

Find the month with smallest CPI

```
months = ['January', 'February', 'March']
prices = [238.11, 237.81, 238.91]
```

```
# Identify min price
min_price = min(prices)

# Identify min price index
min_index = prices.index(min_price)

# Identify the month with min price
min_month = months[min_index]
print(min_month)
```

```
February
```

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