



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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