

Python Data Types

- float - real numbers
- int - integer numbers
- str - string, text
- bool - True, False

```
height = 1.73  
tall = True
```

- Each variable represents single value

Problem

- Data Science: many data points
- Height of entire family

```
height1 = 1.73  
height2 = 1.68  
height3 = 1.71  
height4 = 1.89
```

- Inconvenient

Python List

- `[a, b, c]`

```
[1.73, 1.68, 1.71, 1.89]
```

```
[1.73, 1.68, 1.71, 1.89]
```

```
fam = [1.73, 1.68, 1.71, 1.89]  
fam
```

```
[1.73, 1.68, 1.71, 1.89]
```

- Name a collection of values
- Contain any type
- Contain different types

Python List

- `[a, b, c]`

```
fam = ["liz", 1.73, "emma", 1.68, "mom", 1.71, "dad", 1.89]  
fam
```

```
['liz', 1.73, 'emma', 1.68, 'mom', 1.71, 'dad', 1.89]
```

```
fam2 = [{"liz", 1.73},  
        {"emma", 1.68},  
        {"mom", 1.71},  
        {"dad", 1.89}]  
fam2
```

```
[['liz', 1.73], ['emma', 1.68], ['mom', 1.71], ['dad', 1.89]]
```

List type

```
type(fam)
```

```
list
```

```
type(fam2)
```

```
list
```

- Specific functionality
- Specific behavior

Let's practice!

INTRODUCTION TO PYTHON

Subsetting lists

```
fam = ["liz", 1.73, "emma", 1.68, "mom", 1.71, "dad", 1.89]  
fam
```

```
['liz', 1.73, 'emma', 1.68, 'mom', 1.71, 'dad', 1.89]
```

```
fam[3]
```

```
1.68
```

Subsetting lists

```
['liz', 1.73, 'emma', 1.68, 'mom', 1.71, 'dad', 1.89]
```

```
fam[6]
```

```
'dad'
```

```
fam[-1]
```

```
1.89
```

```
fam[7]
```

```
1.89
```


Subsetting lists

```
['liz', 1.73, 'emma', 1.68, 'mom', 1.71, 'dad', 1.89]
```

```
fam[6]
```

```
'dad'
```

```
fam[-1] # <-
```

```
1.89
```

```
fam[7] # <-
```

```
1.89
```

List slicing

```
fam
```

```
['liz', 1.73, 'emma', 1.68, 'mom', 1.71, 'dad', 1.89]
```

```
fam[3:5]
```

```
[1.68, 'mom']
```

```
fam[1:4]
```

```
[1.73, 'emma', 1.68]
```

[**start** : **end**]

inclusive

exclusive

List slicing

```
fam
```

```
['liz', 1.73, 'emma', 1.68, 'mom', 1.71, 'dad', 1.89]
```

```
fam[:4]
```

```
['liz', 1.73, 'emma', 1.68]
```

```
fam[5:]
```

```
[1.71, 'dad', 1.89]
```

Let's practice!

INTRODUCTION TO PYTHON

List Manipulation

- Change list elements
- Add list elements
- Remove list elements

Changing list elements

```
fam = ["liz", 1.73, "emma", 1.68, "mom", 1.71, "dad", 1.89]  
fam
```

```
['liz', 1.73, 'emma', 1.68, 'mom', 1.71, 'dad', 1.89]
```

```
fam[7] = 1.86  
fam
```

```
['liz', 1.73, 'emma', 1.68, 'mom', 1.71, 'dad', 1.86]
```

```
fam[0:2] = ["lisa", 1.74]  
fam
```

```
['lisa', 1.74, 'emma', 1.68, 'mom', 1.71, 'dad', 1.86]
```

Adding and removing elements

```
fam + ["me", 1.79]
```

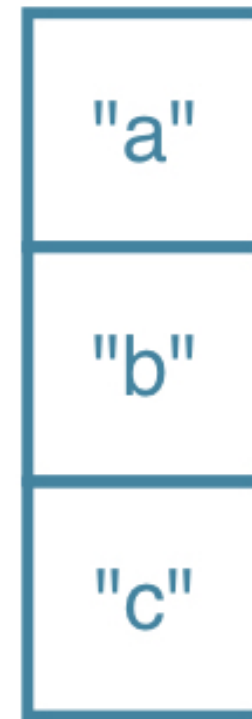
```
['lisa', 1.74, 'emma', 1.68, 'mom', 1.71, 'dad', 1.86, 'me', 1.79]
```

```
fam_ext = fam + ["me", 1.79]  
del(fam[2])  
fam
```

```
['lisa', 1.74, 1.68, 'mom', 1.71, 'dad', 1.86]
```

Behind the scenes (1)

```
x = ["a", "b", "c"]
```



Behind the scenes (1)

```
x = ["a", "b", "c"]
```

```
y = x
```

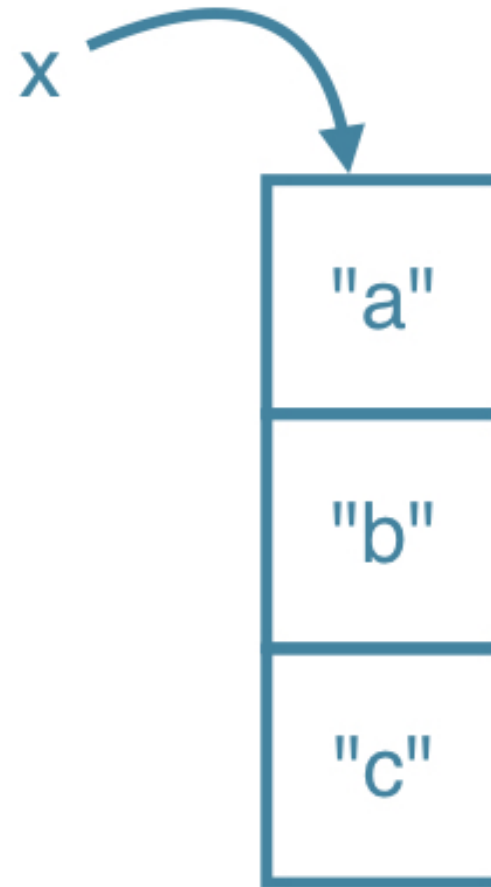
```
y[1] = "z"
```

```
y
```

```
['a', 'z', 'c']
```

```
x
```

```
['a', 'z', 'c']
```



Behind the scenes (1)

```
x = ["a", "b", "c"]
```

```
y = x
```

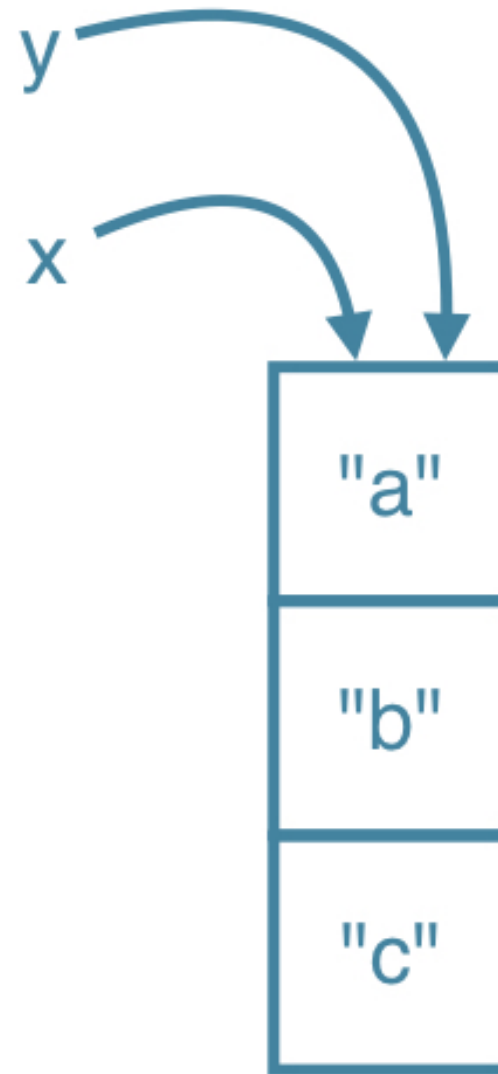
```
y[1] = "z"
```

```
y
```

```
['a', 'z', 'c']
```

```
x
```

```
['a', 'z', 'c']
```



Behind the scenes (1)

```
x = ["a", "b", "c"]
```

```
y = x
```

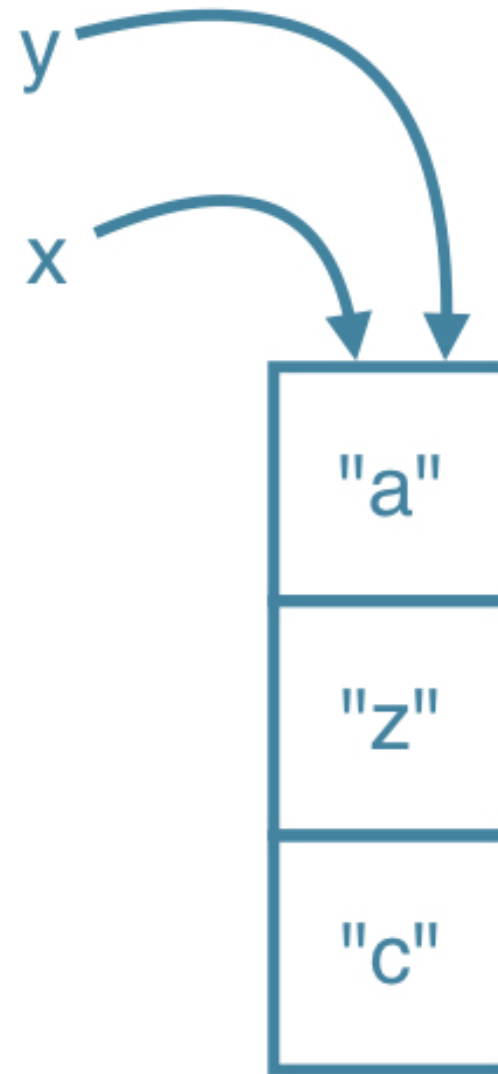
```
y[1] = "z"
```

```
y
```

```
['a', 'z', 'c']
```

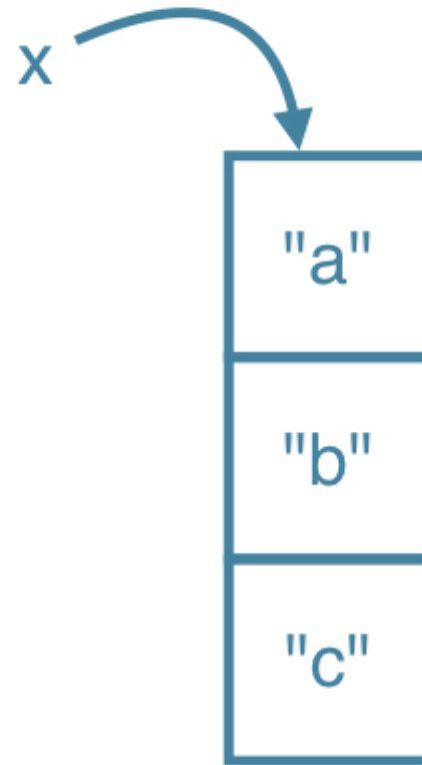
```
x
```

```
['a', 'z', 'c']
```



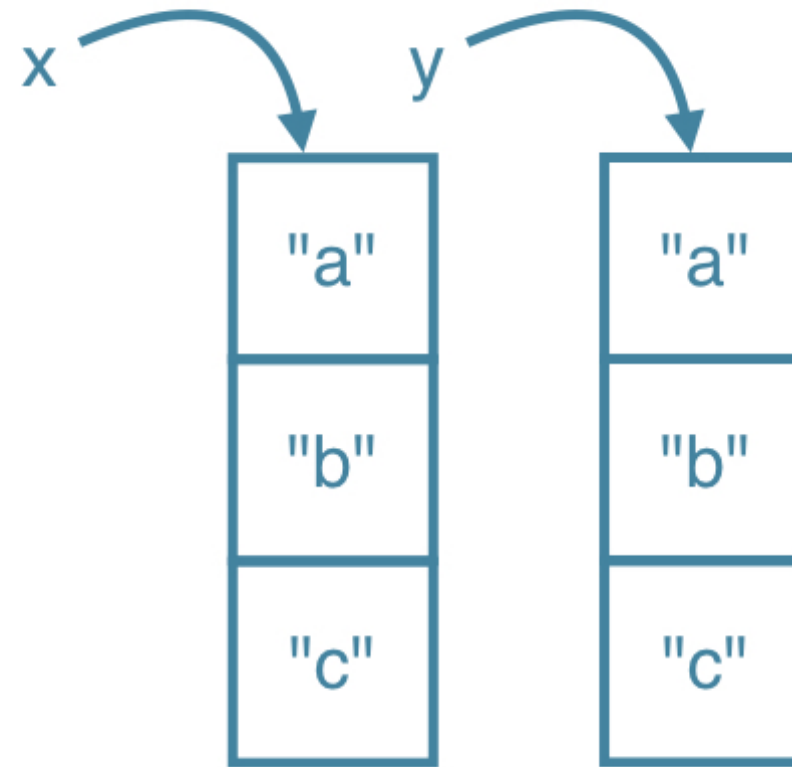
Behind the scenes (2)

```
x = ["a", "b", "c"]
```



Behind the scenes (2)

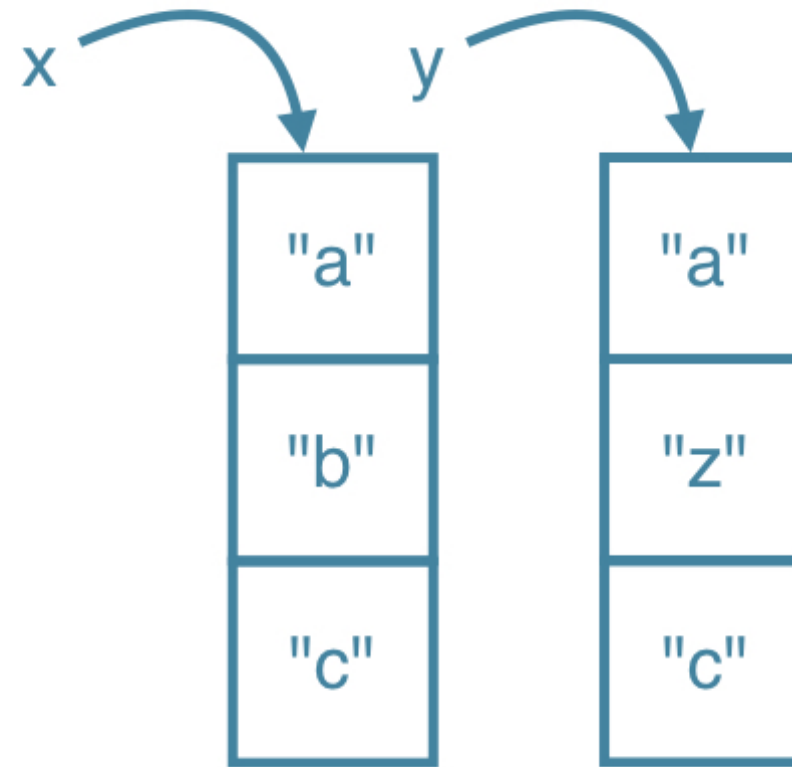
```
x = ["a", "b", "c"]  
y = list(x)  
y = x[:]
```



Behind the scenes (2)

```
x = ["a", "b", "c"]  
y = list(x)  
y = x[:]  
y[1] = "z"  
x
```

```
['a', 'b', 'c']
```



Let's practice!

INTRODUCTION TO PYTHON