

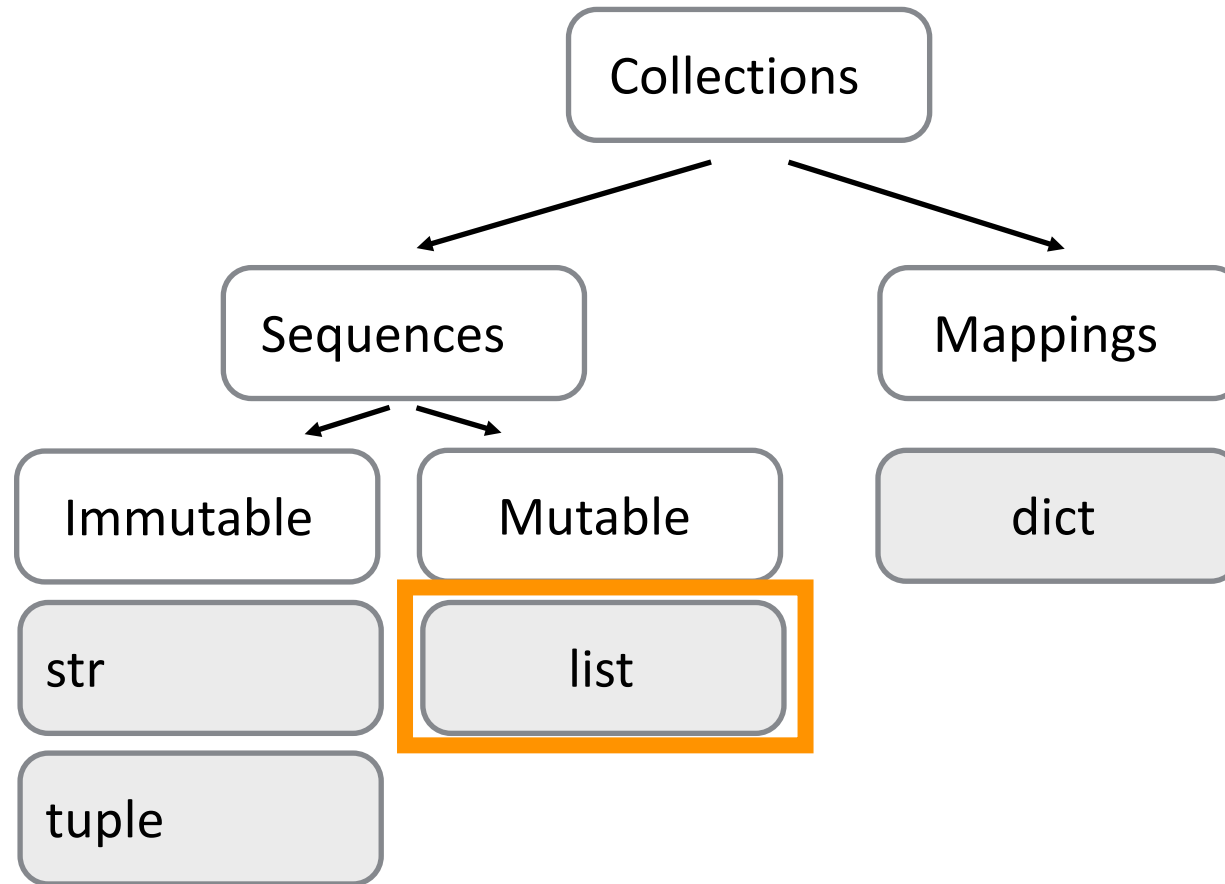
Introduction to Computer Programming Lecture 2.2:

Lists & Strings

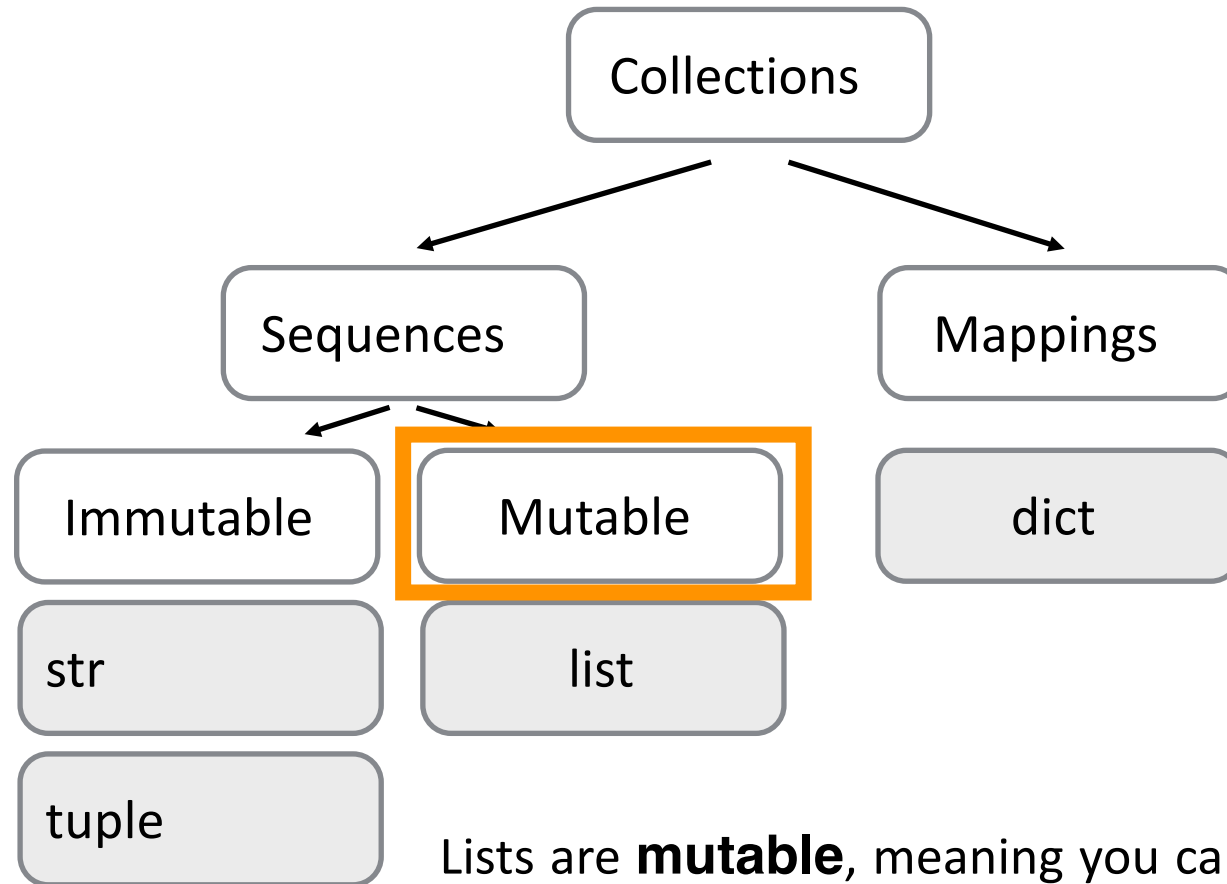
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Lists in Python



Lists in Python



Lists are **mutable**, meaning you can change the values of the elements or remove and elements in-place.

Creating Lists

Empty lists (good for initialisation)

```
>>> Days = []
```

Lists with values

```
>>> Days = ["Mon", "Tue", "Wed", "Thu"]
```

```
>>> Days
```

```
['Mon', 'Tue', 'Wed', 'Thu']
```

Editing Lists

Items in a list can be accessed using their index.
Beware that indices start in 0, not 1!

```
Indices :      0      1      2      3      4      5      6
>>> Days = ["Mon", "Tue", "Wed", "Thu", "Fri", "Sat", "Sun"]
>>> Days
['Mon', 'Tue', 'Wed', 'Thu', 'Fri', 'Sat', 'Sun']
>>> Days[0] = "Mon"
>>> Days
['Mon', 'Tue', 'Wed', 'Thu', 'Fri', 'Sat', 'Sun']
>>> Days[0]
'Mon'
```

Adding to Lists

List operators to add items to lists

```
>>> Days.append("Fri")
>>> Days
['Mon', 'Tue', 'Wed', 'Thur', 'Fri']
>>> Days = Days + ["Sat"]
>>> Days
['Mon', 'Tue', 'Wed', 'Thur', 'Fri', 'Sat']
>>> Days.insert(6, "Sun")
>>> Days
['Mon', 'Tue', 'Wed', 'Thur', 'Fri', 'Sat', 'Sun']
```

Checking the length of a list

```
>>> len(Days)
7
```

Removing from Lists

Remove: Remove the first matching value from a list

```
>>> Days = ['Mon', 'Tue', 'Wed', 'Thu', 'Fri', 'Sat']
>>> Days.remove('Wed')
>>> Days
['Mon', 'Tue', 'Thu', 'Fri', 'Sat']
```

del: Removes item at a specific index

```
>>> Days = ['Mon', 'Tue', 'Wed', 'Thu', 'Fri', 'Sat']
>>> del Days[1]
['Mon', 'Wed', 'Thu', 'Fri', 'Sat']
```

pop: Removes item at a specific index and returns it

```
>>> Days = ['Mon', 'Tue', 'Wed', 'Thu', 'Fri', 'Sat']
>>> thursday = Days.pop(3)
['Mon', 'Tue', 'Thu', 'Fri', 'Sat']
```

Emptying a list (same as initialising the list)

```
>>> Days = ['Mon', 'Tue', 'Wed', 'Thu', 'Fri', 'Sat']
>>> Days = []
>>> Days
[]
```

Searching Lists

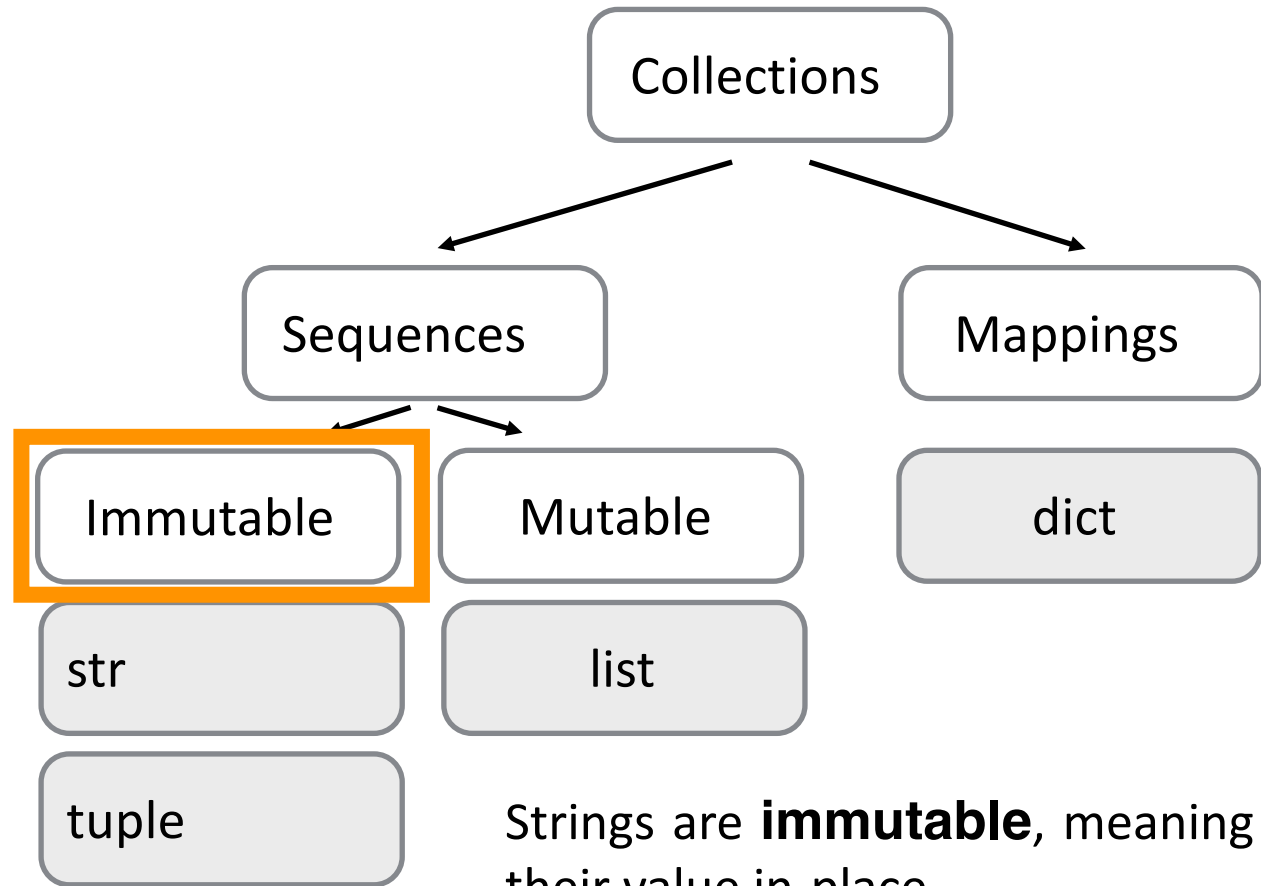
```
>>> Days.index("Wed")  
2  
>>> Days.count("Mon")  
1
```


Editing Lists

```
>>> Days[0] = "Mon"  
>>> Days  
['Mon', 'Tue', 'Wed', 'Thu', 'Fri', 'Sat', 'Sun']
```

Content is edited in-place - lists are **mutable!**

Strings in Python



Strings are **immutable**, meaning you can't change their value in-place.

Strings are a **sequence** of characters.

index
starts at 0!

H	e	l	l	o	!
0	1	2	3	4	5
-6	-5	-4	-3	-2	-1

count backwards
work as well

You can access individual characters:

```
>>> w = "Hello!"  
>>> w[0]  
'H'  
>>> w[4]  
'o'
```

```
>>> w[-1]  
'!'  
>>> w[2]==w[-4]  
True
```

Strings are Immutable

```
>>> A="Hello"  
>>> A="Bye"  
>>>
```

```
>>> A[0]  
'B'  
>>> A[0]='C'
```

Immutable: can't change in place!

```
Traceback (most recent call last):  
  File "<pyshell#48>", line 1, in <module>  
    A[0]='C'  
TypeError: 'str' object does not support item assignment
```

Strings Operators

returns starting
index

```
>>> MyText = "Hello"
>>> MyText = MyText + " World"
>>> MyText
'Hello World'
>>> MyText.find("World")
6
>>> len(MyText)
11
```

returns length of string
(spaces count as well)

```
>>> MyText.lower()
'hello world'
```

“dot operator”
to access
more functionality

```
>>> help(str)
```

```
>>> help(str.join)
```

help for one specific function,
e.g. what does “join” do

look up all built-
in functions possible
with strings