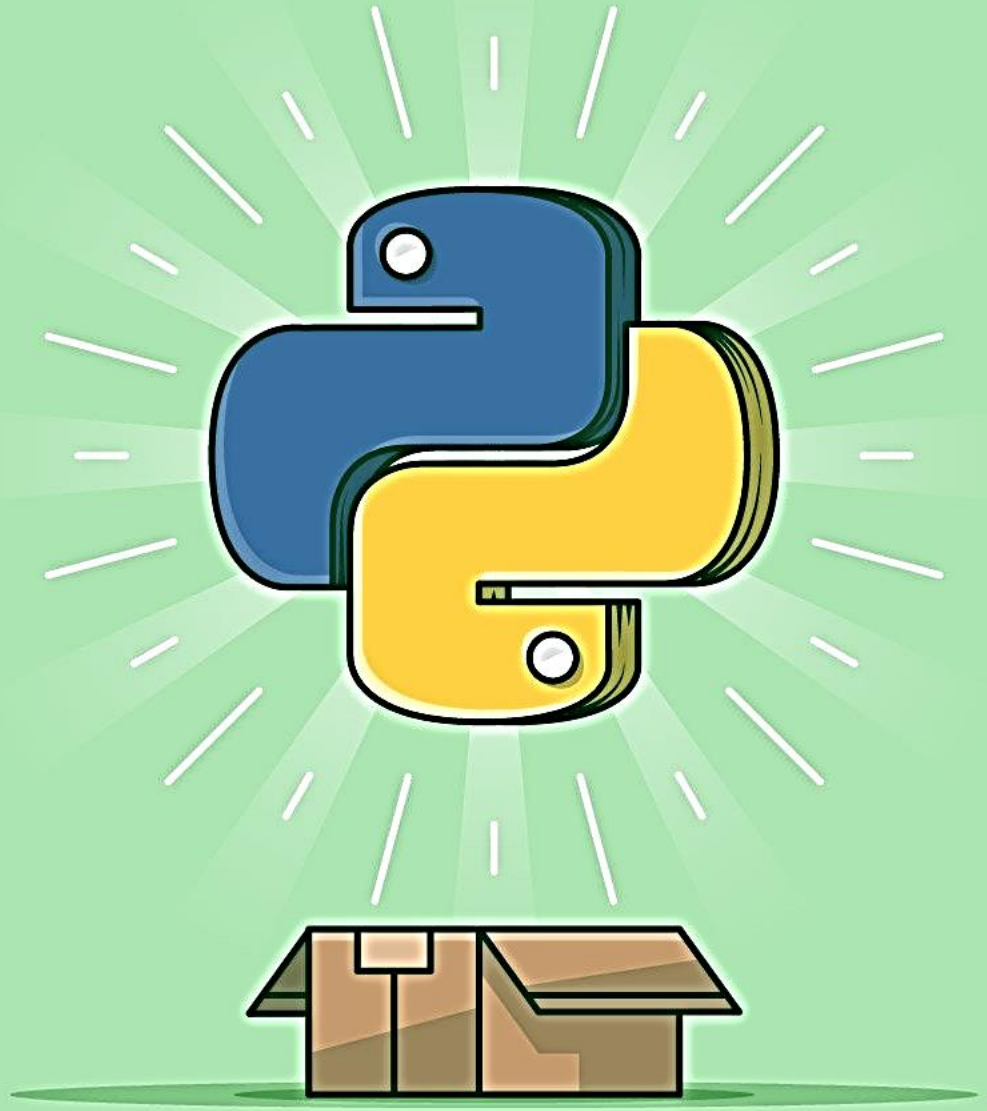
ISLab Python Course

Session 3: Beyond Basics



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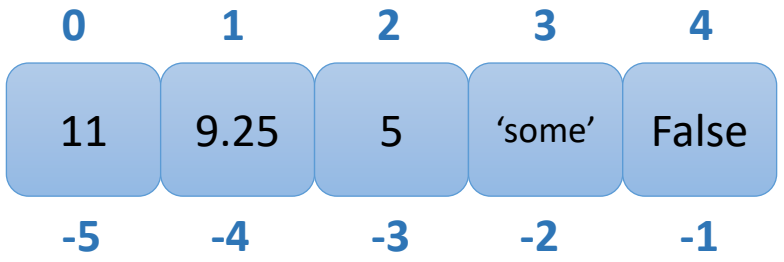
Python Data Types Comparison

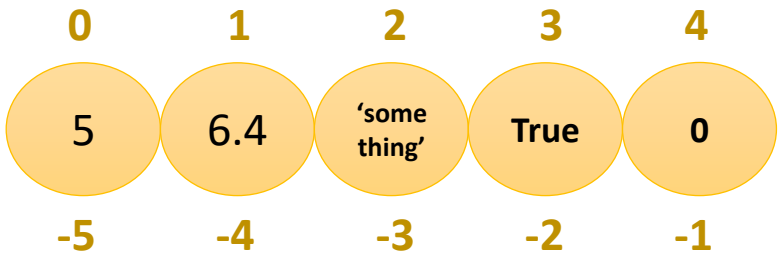
Data Type	Declaration Syntax	Ordered	Mutable	Indexed	Can Have Duplicate Keys/IDs	Can Have Duplicate Values	Value Type
List	[]	✓	✓	✓ (int ID)	X	✓	Variable Types Data Types Data Structures
Tuple	()	✓	X	✓ (int ID)	X	✓	Variable Types Data Types Data Structures
Dictionary	{}	X	✓	✓ (immutable Key)	X	✓	Variable Types Data Types Data Structures
Set	{}	X	✓	X	-	X	Variable Types Only + Tuple

Indices for List & Tuple Data Types

```
sample_list = [11, 9.25, 5, 'some', False]
```



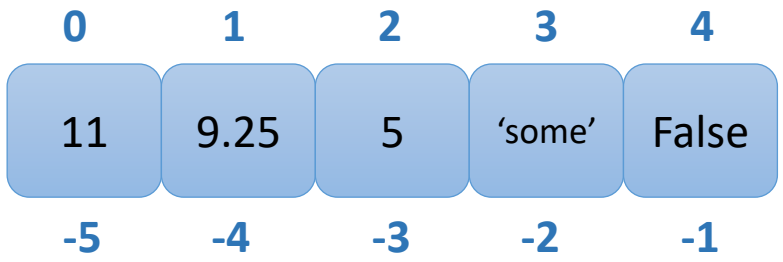

```
sample_tuple = (5, 6.4, 'something', True)
```



Slicing

- A slice is a subset of elements
- Only possible for ordered data types (list/tuple)

```
sample_list = [11, 9.25, 5, 'some', False]
```



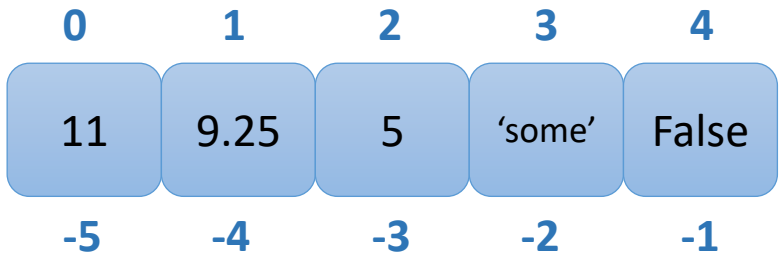

```
sample_list[4]
```

False

```
sample_list[-1]
```

Slicing

```
sample_list = [11, 9.25, 5, 'some', False]
```



sample_list[start:stop]

$$(a, b) =]a, b[= \{x \in \mathbb{R} \mid a < x < b\},$$
$$[a, b) = [a, b[= \{x \in \mathbb{R} \mid a \leq x < b\},$$
$$(a, b] =]a, b] = \{x \in \mathbb{R} \mid a < x \leq b\},$$
$$[a, b] = [a, b] = \{x \in \mathbb{R} \mid a \leq x \leq b\}.$$

Slicing with Steps

sample_list[start:stop:step]

- Negative steps are also possible
- With negative stepping, the order in which the elements are returned changes

Positive Stepping

Negative Stepping

Packing and Unpacking

```
# packing to a tuple
tuple_var1 = (1, 2, 3, 4, 5)
```

```
# unpacking from a tuple
a, b, c, d, e = tuple_var1
print('a=', a, ', b=', b, ', c=', c)
```