

Effective Programming Practices for Economists

Basic Python

If conditions

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Motivation

- So far, all of our instructions in Python were very explicit
- There was no way of reacting to different situations:
 - Collecting elements of a list that fulfil a condition
 - Doing different things for different types of variables
 - ...
- This is what if conditions are for

Example: clipping a number

```
>>> number = -3.1

>>> if number < -3:
...     clipped = -3.0
... elif number > 3:
...     clipped = 3.0
... else:
...     clipped = number

>>> clipped
-3.0
```

- ``if``, ``elif``, and ``else`` are special keywords
- End each condition with a ``:``
- What happens if that condition is ``True`` needs to be indented by 4 spaces and can span one or multiple lines
- Code following ``False`` conditions is skipped
- ``elif x:`` is the same as ``else:`` + nested ``if x:``

More on Booleans

```
>>> bool(0)
False
```

```
>>> bool(-1)
True
```

```
>>> bool(1)
True
```

```
>>> bool([])
False
```

```
>>> bool([1, 2, 3])
True
```

```
>>> bool("")
False
```

```
>>> bool("abc")
True
```

- What is not a Boolean can be converted to a Boolean
- This conversion happens implicitly after `if` and `elif`
- Can be useful and elegant but might compromise readability
- Rules of thumb:
 - 0 is `False`-ish
 - Other numbers are `True`-ish
 - Len=0 collections are `False`-ish
 - Len>0 collections are `True`-ish

More complex conditions

- Remember operators from "Assignments and Scalar Types":
 - ``and``
 - ``or`` (inclusive)
 - ``not``
- Example:

```
if a > b and b > some_cutoff:  
    do_something()  
else:  
    do_something_else()
```

Filtering loops

```
>>> names = ["Guy", "Ray", "Tim"]
>>> names_with_i = []
>>> for n in names:
>>>     if "i" in n:
>>>         names_with_i.append(n)
>>> names_with_i
['Tim']
```

- Can filter lists based on properties of items
- Can filter dictionaries based on properties of keys and/or values
- Example usecases:
 - Find elements above a cutoff
 - Extract female names
 - Exclude invalid data