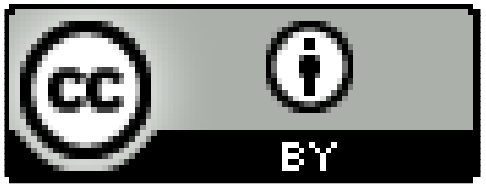
Python

Tuples



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Useful even before then

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>>> primes = (2, 3, 5, 7)
>>> print primes[0], primes[-1]
2 7
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```

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>>> primes = (2, 3, 5, 7)
>>> print primes[0], primes[-1]
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>>> empty_tuple = ()
>>> print len(empty_tuple)
0
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One of Python's few syntactic warts...

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>>> primes = 2, 3, 5, 7
>>> print primes
(2, 3, 5, 7)
>>>
```

Can use on the left of assignment

```
>>> left, middle, right = 2, 3, 5
>>>
```

Don't need parentheses if context is enough

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(2, 3, 5, 7)
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```

Can use on the left of assignment

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>>> left, middle, right = 2, 3, 5
>>> print left
2
>>> print middle
3
>>> print right
5
>>>
```

Don't need parentheses if context is enough

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>>> print middle
3
>>> print right
5
>>>
```

With great power comes great responsibility...

Allows functions to return multiple values

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```
>>> def bounds(values):
...     low = min(values)
...     high = max(values)
...     return (low, high)
...
>>>
```

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>>> def bounds(values):
...     low = min(values)
...     high = max(values)
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...
>>> print bounds([3, -5, 9, 4, 17, 0])
(-5, 17)
>>>
```

Allows functions to return multiple values

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>>> def bounds(values):
...     low = min(values)
...     high = max(values)
...     return (low, high)
...
>>> print bounds([3, -5, 9, 4, 17, 0])
(-5, 17)
>>> least, greatest = bounds([3, -5, 9, 4, 17, 0])
>>> print least
5
>>> print greatest
17
>>>
```

Sometimes used to return (success, result) pairs

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```
def read_if_available(datafile_name):
  if file_exists(datafile_name):
    ...
    return (True, data_values)
  else:
    return (False, [])
```

Sometimes used to return (success, result) pairs

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def read_if_available(datafile_name):
  if file_exists(datafile_name):
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success, data = read_if_available('mydata.dat')
if success:
  ...
```

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def read_if_available(datafile_name):
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We'll meet a better way in the lecture on testing

Provides a quick way to swap variables' values

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Python creates temporaries if needed

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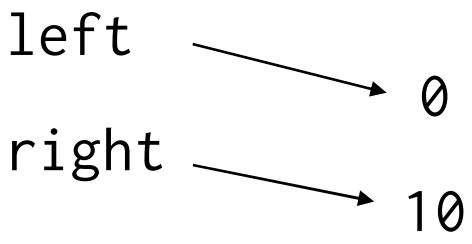

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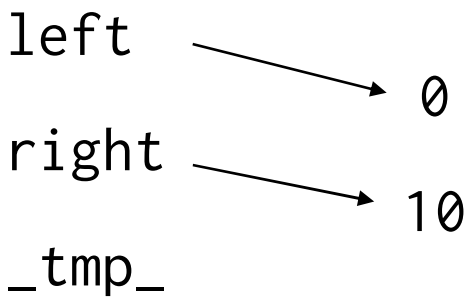

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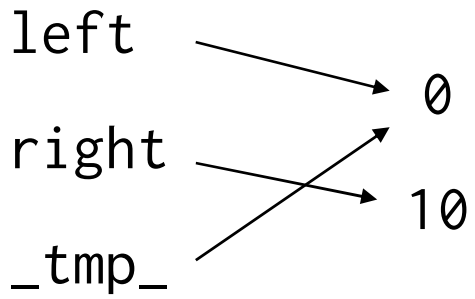

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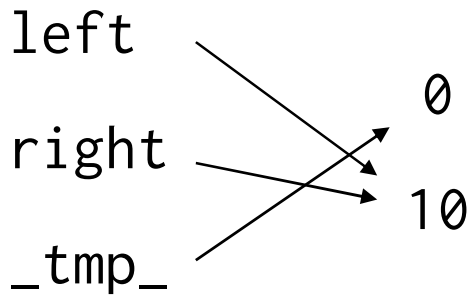

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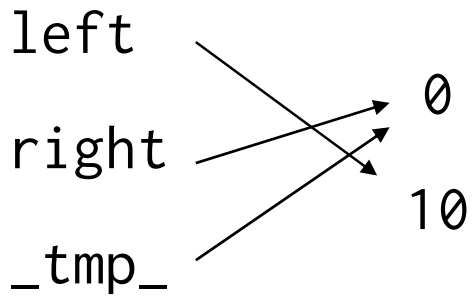

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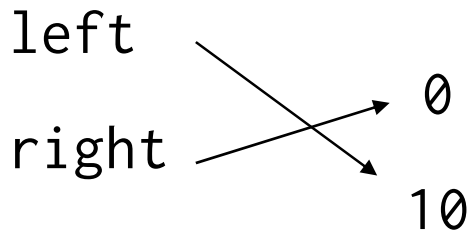

And an easy way to unpack a list

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```
>>> colors = ['yellow', 'magenta', 'lavender']
>>>
```

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>>> colors = ['yellow', 'magenta', 'lavender']
>>> left, middle, right = colors
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>>> print middle
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And an easy way to unpack a list

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magenta
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```

Number of values must be the same

Often used in loops

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```
>>> pairs = ((1, 10), (2, 20), (3, 30), (4, 40))
>>>
```

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```
>>> pairs = ((1, 10), (2, 20), (3, 30), (4, 40))
>>> for p in pairs:
...   print p[0] + p[1]
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Often used in loops

```
>>> pairs = ((1, 10), (2, 20), (3, 30), (4, 40))
>>> for (low, high) in pairs:
...   print low + high
```

Often used in loops

```
>>> pairs = ((1, 10), (2, 20), (3, 30), (4, 40))
>>> for (low, high) in pairs:
...     print low + high
...
11
22
33
44
>>>
```

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>>> colors = ['yellow', 'magenta', 'lavender']
>>> for (i, name) in enumerate(colors):
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2 lavender
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Prefer this to `range(len(values))`

created by

Greg Wilson

October 2010