

Tup	es	are	like	lists

• Tuples are another kind of sequence that function much like a list - they have elements which are indexed starting at 0

```
>>> x = ('Glenn', 'Sally', 'Joseph')
>>> print x[2]
Joseph
                                          >>> for iter in y:
>>> y = (1, 9, 2)
                                                  print iter
                                          . . .
>>> print y
                                          . . .
(1, 9, 2)
                                          1
>>> print max(y)
                                          9
9
                                          2
                                          >>>
```

..but..Tuples are "immutable"

- Unlike a list, once you create a tuple, you cannot alter its contents similar to a string
- >>> x = [9, 8, 7]
 >>> x[2] = 6
 >>> print x
 [9, 8, 6]
 >>>
- >>> y = 'ABC'
 >>> y[2] = 'D'
 Traceback:
 'str' object does
 not support item
 assignment
 >>>
- >>> z = (5, 4, 3)
 >>> z[2] = 0
 Traceback:
 'tuple' object does
 not support item
 assignment
 >>>

Things not to do with tuples

>>> x = (3, 2, 1)
>>> x.sort()
Traceback:
AttributeError: 'tuple' object has no attribute 'sort'
>>> x.append(5)
Traceback:
AttributeError: 'tuple' object has no attribute 'append'
>>> x.reverse()
Traceback:
AttributeError: 'tuple' object has no attribute 'reverse'
>>>

A Tale of Two Sequences

>>> l = list()
>>> dir(l)
['append', 'count', 'extend', 'index', 'insert',
'pop', 'remove', 'reverse', 'sort']

>>> t = tuple()
>>> dir(t)
['count', 'index']

Tuples are more efficient

- Since Python does not have to build tuple structures to be modifiable, they are simpler and more efficient in terms of memory use and performance than lists
- So in our program when we are making "temporary variables" we prefer tuples over lists.

Tuples and Assignment

- We can also put a tuple on the left hand side of an assignment statement
- We can even omit the parenthesis

```
>>> (x, y) = (4, 'fred')
>>> print y
fred
>>> a, b = (99, 98)
>>> print a
99
```

Tuples and Dictionaries	>>> d = dict() >>> d['csev'] = 2
	<pre>>>> d['cwen'] = 4 >>> for (k,v) in d.items(): print k, v</pre>
• The items() method in dictionaries returns a list of (key, value) tuples	<pre> csev 2 cwen 4 >>> tups = d.items() >>> print tups [('csev', 2), ('cwen', 4)]</pre>

Tuples are Comparable

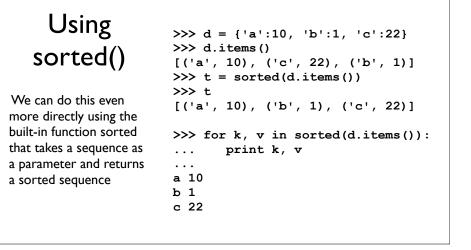
 The comparison operators work with tuples and other sequences If the first item is equal, Python goes on to the next element, and so on, until it finds elements that differ.

```
>>> (0, 1, 2) < (5, 1, 2)
True
>>> (0, 1, 2000000) < (0, 3, 4)
True
>>> ( 'Jones', 'Sally' ) < ('Jones', 'Fred')
False
>>> ( 'Jones', 'Sally') > ('Adams', 'Sam')
True
```

Sorting Lists of Tuples

- We can take advantage of the ability to sort a list of tuples to get a sorted version of a dictionary
- First we sort the dictionary by the key using the items() method

```
>>> d = {'a':10, 'b':1, 'c':22}
>>> t = d.items()
>>> t
[('a', 10), ('c', 22), ('b', 1)]
>>> t.sort()
>>> t
[('a', 10), ('b', 1), ('c', 22)]
```



Sort by values instead of key

•	If we could
	construct a list of
	tuples of the form
	(value, key) we
	could sort by value

 We do this with a for loop that creates a list of tuples >>> c = {'a':10, 'b':1, 'c':22}
>>> tmp = list()
>>> for k, v in c.items() :
...
>>> print tmp
[(10, 'a'), (22, 'c'), (1, 'b')]
>>> tmp.sort(reverse=True)
>>> print tmp
[(22, 'c'), (10, 'a'), (1, 'b')]

```
fhand = open('romeo.txt')
counts = dict()
for line in fhand:
    words = line.split()
    for word in words:
        counts[word] = counts.get(word, 0 ) + 1
lst = list()
for key, val in counts.items():
    lst.append( (val, key) )
lst.sort(reverse=True)
for val, key in lst[:10] :
    print key, val
    The
```

The top 10 most common words.

Even Shorter Version (adv)

>>> c = {'a':10, 'b':1, 'c':22}

>>> print sorted([(v,k) for k,v in c.items()])

[(1, 'b'), (10, 'a'), (22, 'c')]

List comprehension creates a dynamic list. In this case, we make a list of reversed tuples and then sort it.

http://wiki.python.org/moin/HowTo/Sorting

