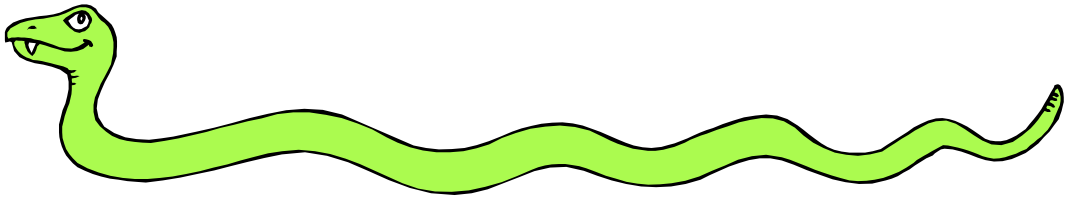
Dictionaries



Dictionaries

- **Mutable** (like lists, unlike numbers, strings and tuples)
- **Unordered** collection of arbitrary objects
- Accessed by **key**, not offset
- Variable length, heterogeneous, arbitrarily nestable

Basic Syntax for Dictionaries 1

- Dictionaries store a mapping between a set of keys and a set of values.
  - Keys can be any immutable type.
  - Values can be any type, and you can have different types of values in the same dictionary.
- You can define, modify, view, lookup, and delete the key-value pairs in the dictionary.

Basic Syntax for Dictionaries 2

```
>>> d = {'user':'bozo', 'pswd':1234}

>>> d['user']
'bozo'

>>> d['pswd']
1234

>>> d['bozo']

Traceback (innermost last):
  File '<interactive input>' line 1, in ?
KeyError: bozo
```

Basic Syntax for Dictionaries 3

```
>>> d = {'user':'bozo', 'pswd':1234}

>>> d['user'] = 'clown'
>>> d
{'user':'clown', 'pswd':1234}
```

Note: Keys are unique.
Assigning to an existing key just replaces its value.

```
>>> d['id'] = 45
>>> d
{'user':'clown', 'id':45, 'pswd':1234}
```

Note: Dictionaries are unordered.
New entry might appear anywhere in the output.

Basic Syntax for Dictionaries 4

```
>>> d = {'user':'bozo', 'p':1234, 'i':34}

>>> del d['user']                  # Remove one.
>>> d
{'p':1234, 'i':34}

>>> d.clear()                      # Remove all.
>>> d
{}
```

Basic Syntax for Dictionaries 5

```
>>> d = {'user':'bozo', 'p':1234, 'i':34}

>>> d.keys()                    # List of keys.
['user', 'p', 'i']

>>> d.values()                  # List of values.
['bozo', 1234, 34]

>>> d.items()          # List of item tuples.
[('user','bozo'), ('p',1234), ('i',34)]
```

Basic Syntax for Dictionaries 6

```
>>> d = {'user':'bozo', 'p':1234, 'i':34}

>>> len(d)                    # length of keys.
3

>>> d.values()                # List of values.
['bozo', 1234, 34]

>>> d.items()          # List of item tuples.
[('user','bozo'), ('p',1234), ('i',34)]
```

Can't concatenate (+), but can combine

```
>>> d = {'user':'bozo', 'p':1234, 'i':34}

>>> d1 = {'class':'syntax','room':'ecme107',
   'i':55}

>>> d.update(d1)                # List of values.
```

How many entries does 'd' have?

What's the value of 'i'?

Can't concatenate (+), but can combine

```
>>> d = {'user':'bozo', 'p':1234, 'i':34}

>>> d1 = {'class':'syntax','room':'ecme107',
   'i':55}

>>> d.update(d1)                  # List of values.
```

What's the value of 'i'?

Dictionary keys are unique!

List dictionary conversion

- List to dictionary

```
>>> li = [['Chinese', 10000],['English', 20000]]
>>> di = dict(li)
```

- Dictionary to list

```
>>> di.keys()
>>> d.values()
>>> d.items()
```

Exercise

- How do you print the keys and values of a dictionary?

Exercise

- Find a file, list the words in that file with their frequency