Using Dictionaries

School of Information Studies
Syracuse University

Dictionary: Defined

Consists of a number of pairs

- Key
- Value

Previous lists were indexed by integers

Dictionary uses the key to index

Creating a Dictionary

```
>>>emptydict = dict ()
>>>emptydict
{}
>>>type (emptydict)
<class ‘dict’>
```

Another way to initialize empty dictionary

```
>>>emptydict ={}
```

Adding Data to Dictionary

```
>>>phonedict = {‘eric’: ‘454-5555’, ‘john’: ‘454-5195’, ‘michael’: ‘454-9999’}
>>>type (phonedict)
<class ‘dict’>
>>>phonedict
{‘eric’: ‘454-5555’, ‘michael’: ‘454-9999’ , ‘john’: ‘454-5195’}
>>>len (phonedict)
3
```

Items in Dictionary

Not necessarily in the same order

Cannot assume items in any particular order

Functions

- Keys ()
  - >>>phonedict.keys ()
  - dict_keys ([‘eric’, ‘michael’, ‘john’])
- Values ()
  - >>>phonedict.values ()
  - dict_values ([‘454-5555’, ‘454-9999’, ‘454-5195’])
- Items ()
  - >>>phonedict.items ()
  - dict_items ([(‘eric’, ‘454-5555’), (‘michael’, ‘454-9999’), (‘john’, ‘454-5195’)])

Items in Dictionary

To find a particular value

- >>>phonedict[‘michael’]
- ‘454-9999’

Key that is not defined

- >>>phonedict[‘chris’]
- Traceback (most recent call last):
- file “<stdin>”, line 1, in <module>
- Keyerror: ‘chris’

Use ‘in’ Boolean operator

- >>’michael’ in phonedict
- True
- >>>’chris’ in phonedict
- False

Adding Items to Dictionary

Use the indexed element

- >>>phonedict[‘chris’] = ‘454-7951’
- >>>phonedict
- {‘eric’: ‘454-5555, ‘michael’: ‘454-9999’ , ‘john’: ‘454-5195, ‘chris’: ‘454-7951’}

To print items in dictionary

- >>>for item in phonedict:
- …   print (item)
- …
- eric
- michael
- john

Printing Items in Dictionary

Use the indexed element

- >>>for key in phonedict:
- …   print (key, phonedict[key])
- …
- eric 454-555
- michael 454-9999
- john 454-5195

Use the key and value

- >>>for key, value in phonedict.items():
- …   print (key, value)
- …
- eric 454-555
- michael 454-9999
- john 454-5195

Sorting Items in Dictionary

Use the indexed element

- >>>sorted (phonedict)
- [‘eric’, ‘john’, ‘michael’]

- >>>for key in sorted (phonedict):
- …   print(key, phonedict[key])
- …
- eric 454-555
- john 454-5195
- michael 454-9999

Sorting Lists

School of Information Studies
Syracuse University

Sorting Data in Place

Sort list in place

```
>>>fruit = [‘banana’, ‘apple’, ‘acai’, ‘cherry’, ‘figs’, ‘apple’, ‘dates’]

>>>fruit.sort ()

>>>fruit

[‘acai’, ‘apple’, ‘apple’, ‘banana’, ‘cherry’, ‘dates’, ‘figs’]
```

Creating a New Sorted List

```
# Leaves the original as is
>>>fruit = [‘banana’, ‘apple’, ‘acai’, ‘cherry’, ‘figs’, ‘apple’, ‘dates’]
>>>fruit_sorted = sorted (fruit)
>>>fruit_sorted
[‘acai’, ‘apple’, ‘apple’, ‘banana’, ‘cherry’, ‘dates’, ‘figs’]
>>>fruit
[‘banana’, ‘apple’, ‘acai’, ‘cherry’, ‘figs’, ‘apple’, ‘dates’]
```

Sorting by Different Attributes

Sort function parameter

- An element of the list
- Selects a key
- Nameless function (lambda)
- Select the element to sort by

```
# Using the NBAlist, let’s sort by attendance
>>>newlist = sorted (NBAlist, key=lambda item: item[1])
>>>newlist                # This is in ascending order
```

Sorting by Different Orders

Use the reverse function to determine ascending or descending

```
>>>newlist = sorted (NBAlist, key=lambda item: item[1],
reverse=True)
>>>newlist                    # This is in descending order
```