ED5340 - Data Science: Theory and Practise

L8 - Dictionaries

Ramanathan Muthuganapathy (https://ed.iitm.ac.in/~raman)
Course web page: https://ed.iitm.ac.in/~raman/datascience.html
Moodle page: Available at https://courses.iitm.ac.in/

Dictionaries

Intro

- Dictionary is a collection of key-value pair rep. as key : value
- Enclosed in curly brackets { }
- Indexed only by keys.
- Keys in a dictionary must be unique and immutable.
- Strings / Tuples can be used as keys.
- Different keys may have same values!

Dictionary representation

- Set is a collection of dissimilar data types using curly brackets { }
- dc = {key : value} i.e. {key1 : value1, key2 : value2, …….}
- E.g. dct1 = {10 : 100, 20 : 200, ‘ED1’ : ‘name1’, ‘ED2’ : ‘name2’}
- dct2 = { } #Empty dictionary
- using dict.fromkeys( ) function.

Accessing dictionary elements

- Using its key, the corresponding value can be accessed.
- print the dictionary using its variable name.
- Iterated using the following ways:
  - over key-value pairs.
  - over keys.
  - over values.

Demo using L8_dict_ex_access.py

CW: Define a dictionary and print all its values using the corresponding keys.

Dictionary operations

- Dictionaries are ‘mutable’ (you can add, delete or modify elements).
- Two dictionaries cannot be concatenated using + (instead, use update( )).
- searching (containment) and sorting - in, not in
- conversion / other functions - len, max, min, sum, sorted

Demo using L8_dict_operations.py

HW: Define a dictionary of student names and find the max, min of the dictionary. Arrange them in sorted order. Print all of them clearly. Also perform addition, deletion and modification of a few of the entries.

What are you observations on max, min and sorting?

Dictionary methods - Member functions

- Given a dictionary D, you can apply the following member functions.
  - D.clear( ) - clears all the dictionary contents
  - D.update(D1) - adds D1 to D.

HW: Define three dictionaries and concatenate all of them in another dictionary. Clear the contents of all of them. Check if the dictionaries are empty.

Dictionary varieties

- Nested Dictonary (similar to nested structure)
- Dictionary unpacking (using * operator)

Nested dictionary

studlist = {‘Anand’ : {‘DOB’ : ’20/11/2001’, ‘Roll’ : ‘ED1234’ },

‘Ramesh’ : {‘DOB’ : ’19/11/2001’, ‘Roll’ : ‘ED1235’ },

‘Kamesh’ : {‘DOB’ : ’21/11/2001’, ‘Roll’ : ‘ED1236’ } }

How do you print, access and change contents of nested dictionary?

Demo using L8_dict_varieties.py

Dictionary Comprehension

same as list comprehension except use curly brackets and key:value pairs

The syntax goes like this:

dctA = {key:value for (key, value) in dict.items( ) [optional for and/or if]}

where dict is another dictionary!

You can do with other than dict.items( ) as well. How?

Demo using
L8_dict_comprehension.py
(CW, HW is available in that file itself)

CW: Create a dictionary consisting of squares of integers from 1 to 9 using dictionary comprehension