lec1_step7

October 22, 2020

```
In [ ]: ## Python basics for novice data scientists, supported by Wagatsuma Lab@Kyutech
        #
        # The MIT License (MIT): Copyright (c) 2020 Hiroaki Wagatsuma and Wagatsuma Lab@Kyutec
        #
        # Permission is hereby granted, free of charge, to any person obtaining a copy of this
        # The above copyright notice and this permission notice shall be included in all copies
        # THE SOFTWARE IS PROVIDED "AS IS", WITHOUT WARRANTY OF ANY KIND, EXPRESS OR IMPLIED,
        #
        # # @Time    : 2020-10-14
        # # @Author  : Hiroaki Wagatsuma
        # # @Site    : https://github.com/hirowgit/2A_python_basic_course
        # # @IDE     : Python 3.7.7 (default, Mar 10 2020, 15:43:27) [Clang 10.0.0 (clang-1000
        # # @File    : lec1_step7.py
```

```
In [ ]: # Practice 3-1 (page 13/29)
        # https://www.slideshare.net/tadahirotaniguchi0624/3-46861684
```

```
In [ ]: # https://note.nkmk.me/python-dict-list-sort/
```

```
In [13]: import pprint

         l = [{'Name': 'Australia', 'Population': 25680158, 'Capital City': 'Canberra','Points
              {'Name': 'Bangladesh', 'Population': 169468990,'Capital City': 'Dhaka', 'Points'
              {'Name': 'Chile', 'Population': 17373831,'Capital City': 'Santiago', 'Points': [-
```

```
In [19]: pprint.pprint(sorted(l, key=lambda x: x['Name']))
```

```
[{'Capital City': 'Canberra',
  'Name': 'Australia',
  'Points': [-35.28, 149.13],
  'Population': 25680158},
 {'Capital City': 'Dhaka',
  'Name': 'Bangladesh',
  'Points': [23.71, 90.41],
  'Population': 169468990},
 {'Capital City': 'Santiago',
  'Name': 'Chile',
  'Points': [-27.37, -70.33],
```

```
              'Population': 17373831}]


In [20]: pprint.pprint(sorted(l, key=lambda x: x['Population']))

[{'Capital City': 'Santiago',
  'Name': 'Chile',
  'Points': [-27.37, -70.33],
  'Population': 17373831},
 {'Capital City': 'Canberra',
  'Name': 'Australia',
  'Points': [-35.28, 149.13],
  'Population': 25680158},
 {'Capital City': 'Dhaka',
  'Name': 'Bangladesh',
  'Points': [23.71, 90.41],
  'Population': 169468990}]


In [21]: pprint.pprint(sorted(l, key=lambda x: x['Population'], reverse=True))

[{'Capital City': 'Dhaka',
  'Name': 'Bangladesh',
  'Points': [23.71, 90.41],
  'Population': 169468990},
 {'Capital City': 'Canberra',
  'Name': 'Australia',
  'Points': [-35.28, 149.13],
  'Population': 25680158},
 {'Capital City': 'Santiago',
  'Name': 'Chile',
  'Points': [-27.37, -70.33],
  'Population': 17373831}]


In [25]: # https://note.nkmk.me/python-dict-create/
         keys = ['k1', 'k2', 'k3']
         values = [1, 2, 3]
         d = {k: v for k, v in zip(keys, values)}
         print(d)

{'k1': 1, 'k2': 2, 'k3': 3}


In [ ]: Node=[]
         keys = ['cost', 'h', 'f']
         values = [1, 2, 3]
         for i in
         d = {k: v for k, v in zip(keys, values)}
         print(d)
```

```
In [28]: # A: ascii code 65
         chr(65)

Out[28]: 'A'

In [32]: # for i in range(1,10,1):
         for i in range(1,10):
             s=chr(i+65-1)
             print(s)
```

A
B
C
D
E
F
G
H
I

```
In [30]: # for i in range(1,10,1):
         for i in range(65,65+10):
             s=chr(i)
             print(s)
```

A
B
C
D
E
F
G
H
I
J

```
In [2]: Node=[chr(i) for i in range(65,65+10)]
        print(Node)
```

['A', 'B', 'C', 'D', 'E', 'F', 'G', 'H', 'I', 'J']

```
In [5]: H=list(range(1,len(Node)))
        print(H)
        H=list(range(1,len(Node)))
        print(H)
        F=3*list(range(1,len(Node)))
        print(F)
```

```
[1, 2, 3, 4, 5, 6, 7, 8, 9]
[1, 2, 3, 4, 5, 6, 7, 8, 9]
[1, 2, 3, 4, 5, 6, 7, 8, 9, 1, 2, 3, 4, 5, 6, 7, 8, 9, 1, 2, 3, 4, 5, 6, 7, 8, 9]


In [6]: print(Cost)
        H=list(map(lambda x: x * 2, Cost))
        print(H)
        F=list(map(lambda x: x * 3, Cost))
        print(F)

[1, 2, 3, 4, 5, 6, 7, 8, 9]
[2, 4, 6, 8, 10, 12, 14, 16, 18]
[3, 6, 9, 12, 15, 18, 21, 24, 27]


In [56]: data1 = [1, 3, 6, 50, 5]
         data2 = list(map(lambda x: x * 2, data1))
         print(data1)
         print(data2)

[1, 3, 6, 50, 5]
[2, 6, 12, 100, 10]


In [64]: keys = ['node','cost', 'h', 'f']
         values = [1, 2, 3]
         d = {k: v for k, v in zip(keys, values)}
         print(d)

{'node': 1, 'cost': 2, 'h': 3}


In [66]: keys = ['node','cost', 'h', 'f']
         values = [1, 2, 3]
         d_all=[]
         for i in range(0,len(Node)-1):
             values=[Node[i],Cost[i],H[i],F[i]]
             d = {k: v for k, v in zip(keys, values)}
             d_all.append(d)
         print(d_all)

[{'node': 'A', 'cost': 1, 'h': 2, 'f': 3}, {'node': 'B', 'cost': 2, 'h': 4, 'f': 6}, {'node':


In [70]: pprint.pprint(sorted(d_all, key=lambda x: x['node']))

[{'cost': 1, 'f': 3, 'h': 2, 'node': 'A'},
 {'cost': 2, 'f': 6, 'h': 4, 'node': 'B'},
```

```
 {'cost': 3, 'f': 9, 'h': 6, 'node': 'C'},
 {'cost': 4, 'f': 12, 'h': 8, 'node': 'D'},
 {'cost': 5, 'f': 15, 'h': 10, 'node': 'E'},
 {'cost': 6, 'f': 18, 'h': 12, 'node': 'F'},
 {'cost': 7, 'f': 21, 'h': 14, 'node': 'G'},
 {'cost': 8, 'f': 24, 'h': 16, 'node': 'H'},
 {'cost': 9, 'f': 27, 'h': 18, 'node': 'I'}]


In [71]: pprint.pprint(sorted(d_all, key=lambda x: x['cost']))

[{'cost': 1, 'f': 3, 'h': 2, 'node': 'A'},
 {'cost': 2, 'f': 6, 'h': 4, 'node': 'B'},
 {'cost': 3, 'f': 9, 'h': 6, 'node': 'C'},
 {'cost': 4, 'f': 12, 'h': 8, 'node': 'D'},
 {'cost': 5, 'f': 15, 'h': 10, 'node': 'E'},
 {'cost': 6, 'f': 18, 'h': 12, 'node': 'F'},
 {'cost': 7, 'f': 21, 'h': 14, 'node': 'G'},
 {'cost': 8, 'f': 24, 'h': 16, 'node': 'H'},
 {'cost': 9, 'f': 27, 'h': 18, 'node': 'I'}]


In [72]: pprint.pprint(sorted(d_all, key=lambda x: x['h']))

[{'cost': 1, 'f': 3, 'h': 2, 'node': 'A'},
 {'cost': 2, 'f': 6, 'h': 4, 'node': 'B'},
 {'cost': 3, 'f': 9, 'h': 6, 'node': 'C'},
 {'cost': 4, 'f': 12, 'h': 8, 'node': 'D'},
 {'cost': 5, 'f': 15, 'h': 10, 'node': 'E'},
 {'cost': 6, 'f': 18, 'h': 12, 'node': 'F'},
 {'cost': 7, 'f': 21, 'h': 14, 'node': 'G'},
 {'cost': 8, 'f': 24, 'h': 16, 'node': 'H'},
 {'cost': 9, 'f': 27, 'h': 18, 'node': 'I'}]


In [73]: pprint.pprint(sorted(d_all, key=lambda x: x['f']))

[{'cost': 1, 'f': 3, 'h': 2, 'node': 'A'},
 {'cost': 2, 'f': 6, 'h': 4, 'node': 'B'},
 {'cost': 3, 'f': 9, 'h': 6, 'node': 'C'},
 {'cost': 4, 'f': 12, 'h': 8, 'node': 'D'},
 {'cost': 5, 'f': 15, 'h': 10, 'node': 'E'},
 {'cost': 6, 'f': 18, 'h': 12, 'node': 'F'},
 {'cost': 7, 'f': 21, 'h': 14, 'node': 'G'},
 {'cost': 8, 'f': 24, 'h': 16, 'node': 'H'},
 {'cost': 9, 'f': 27, 'h': 18, 'node': 'I'}]


In [ ]:
```