Dictionary

Introduction

- Pair of items
- Each pair has key and value
- Keys should be unique
- Key and value are separated by :
- Each pair is separated by ,

Example:

dict = {‘Alice’ : 1234, ‘Bob’ : 1235}

Properties of Dictionaries

unordered mutable collections;

items are stored and fetched by key,

Accessed by key, not offset position

Unordered collections of arbitrary objects

Variable-length, heterogeneous, and arbitrarily nestable

Creating a Dictionary

- Creating an EMPTY dictionary

  dictname = {}

Example:

Dict1 = {}

MyDict = {}

Books = {}

- Creating a dictionary with items

dictname = {key1:val1, key2:val2, ….}

Example:

MyDict = { 1 : 'Chocolate', 2 : 'Icecream'}

MyCourse = {'MS' : 'Python', 'IT' : 'C', 'CSE' : 'C++', 'MCA' : 'Java'}

MyCircle = {'Hubby':9486028245, 'Mom':9486301601}

Accessing Values

- Using keys within square brackets

```
>>> print (MyDict[1])
      'Chocolate'
>>> print (MyCourse['CSE'])
      'C++'
```

Updating Elements

- update by adding a new item (key-value) pair
- modify an existing entry

```
>>>MyDict[1] = ‘Pizza’
>>>MyCourse[‘MCA’] = ‘UML’
```

Deleting Elements

- remove an element in a dictionary using the key

```
>>>del MyCourse['IT']
```

- remove all the elements

```
>>>MyCourse.clear()
```

- delete the dictionary

```
>>>del MyCourse
```

List vs Dictionary

```
>>>  L = []
>>> L[99] = 'spam'
Traceback (most recent call last):  File "<stdin>", line
   1, in ? IndexError: list assignment index out of
   range
>>>D = {}
>>> D[99] = 'spam'
>>> D[99] 'spam'
>>> D {99: 'spam'}
```

Nesting in dictionaries

```
>>> rec = {'name': 'Bob',
...                 'jobs': ['developer', 'manager'],
...                 'web':  'www.bobs.org/~Bob',
...                 'home': {'state': 'Overworked', 'zip':
    12345}}
```

A list can be within a dictionary and dictionary within dictionary

Other Ways to Make Dictionaries

```
{'name': 'Bob', 'age': 40}   # Traditional literal expression
D = {}                       # Assign by keys dynamically
D['name'] = 'Bob'
D['age']  = 40

# dict keyword argument form
dict(name='Bob', age=40)

# dict key/value tuples form
dict([('name', 'Bob'), ('age', 40)])
```

Dictionary methods

- `<dict>.items()`
  - displays the items in the dictionary (pair of keys and values)
- `<dict>.keys() / <dict>.viewkeys()`
  - display the keys in the dictionary
- `<dict>.values() / <dict>.viewvalues()`
  - displays the values in the dictionary
- `<dict>.pop()`
  - removes the last item from the dictionary
- `<dict2> = <dict1>.copy()`
  - copies the items from dict1 to dict2
- `<dict>.clear()`
  - removes all the items from the dictionary

Other methods

- `str(dict)`
  - produces printable string representation of a dictionary
- `len(dict)`
  - returns the number of items in the dictionary

```
students={’22MIA1002':'Xyz',‘22MIA1003':'Abc'}
print(students)
print(students.keys())
print(students.values())
print(students[‘22MIA1002'])
```

```
d={}
n=int(input("No of students"))
for i in range(0,n):
    regno=input("Enter reg no")
    sname=input("Enter student name")
    d[regno]=sname
print(d)


for key in sorted(d):
    print ("%s: %s" % (key, d[key]))
```

Write a program to create a dictionary that stores the student details like rollno, name and their CSE3041 marks in CAT1, CAT2 and FAT.

{Rollno:[Name,CAT1_Marks,CAT2_Marks,FAT_Marks]

Eg:

d={121:['Ajay',12,13,14],734:['Akash',67,56,45],555:['Vineeth',45,34,34]}

```
d={}
n=int(input())
for i in range(0,n):
    regno=int(input("Enter reg no"))
    l=[]
    l.append(input("Enter name"))
    l.append(int(input("Enter Mark1")))
    l.append(int(input("Enter Mark2")))
    l.append(int(input("Enter Mark3")))
    d[regno]=l
print(d)


for key in sorted(d):
    print ("%d: %s" % (key, d[key]))
```

Exercise 1:

Write a program to maintain a telephone directory of the employees of an organization. If the employee has more than one number store all the numbers. Write a program to print the mobile numbers given full or part of the name of the employee. Eg: Given name of the employee as ‘John’ the program must print phone numbers of ‘John Paul’ and ‘Michel John’.

```
phoneno = {'ABC jhk':[89898,89898],'xAyz':2233,'sdf
ABC':[13312,454,4545]}

cname=input("Enter the name")
for name in phoneno:
    if(cname in name):
        print(phoneno[name])
        break
else:
    print('Name not found')
```

```
n=int(input("enter n"))
phonedir={}

for i in range(0,n):
    cname=input("Enter the name")
    no=""
    phone=[]
    while (no!="-1"):
        no=input("enter phone no. Enter -1 to terminate")
        phone.append(no)
    phonedir[cname]=phone

print(phonedir)
sname=input("Enter name to be searched")
Sname=sname.lower()
for name in phonedir:
    if(sname in name.lower()):
        print(name + ": "+ str(phonedir[name]))
```

Exercise 2:

Write a program to store the name of the players against each of a 20-20 cricket team. The program should print the name of the players given the team name.