Chapter 14
Dictionary

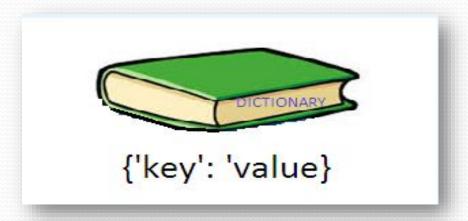Computer Science

Class XI (As per CBSE Board)

It is an unordered collection of items where each item consist of a key and a value.
It is mutable (can modify its contents) but Key must be unique and immutable.

{'key': 'value'}

Creating A Dictionary

It is enclosed in curly braces {} and each item is separated from other item by a comma(,). Within each item, key and value are separated by a colon (:).Passing value in dictionary at declaration is <u>dictionary initialization</u>.get() method is used to access value of a key

e.g.
dict = {'Subject': 'Informatic Practices', 'Class': '11'}

Accessing List Item

dict = {'Subject': 'Informatics Practices', 'Class': 11}
print(dict)
print ("Subject : ", dict['Subject'])
print ("Class : ", dict.get('Class'))
OUTPUT
{'Class': '11', 'Subject': 'Informatics Practices'}
('Subject : ', 'Informatics Practices')
('Class : ', 11)

Iterating / Traversing through A Dictionary

Following example will show how dictionary items can be accessed through loop.

<u>e.g.</u>

dict = {'Subject': 'Informatics Practices', 'Class': 11}

for i in dict:

    print(dict[i])

OUTPUT

11

Informatics Practices

Updating/Manipulating Dictionary Elements

We can change the individual element of dictionary.

e.g.

dict = {'Subject': 'Informatics Practices', 'Class': 11}

dict['Subject']='computer science'

print(dict)

OUTPUT

{'Class': 11, 'Subject': 'computer science'}

Deleting Dictionary Elements
del, pop() and clear() statement are used to remove elements from the dictionary.

del e.g.
dict = {'Subject': 'Informatics Practices', 'Class': 11}
print('before del', dict)
del dict['Class'] # delete single element
print('after item delete', dict)
del dict #delete whole dictionary
print('after dictionary delete', dict)

Output
('before del', {'Class': 11, 'Subject': 'Informatics Practices'})
('after item delete', {'Subject': 'Informatics Practices'})
('after dictionary delete', <type 'dict'>)

pop() method is used to remove a particular item in a dictionary. clear() method is used to remove all elements from the dictionary.

<u>e.g.</u>
dict = {'Subject': 'Informatics Practices', 'Class': 11}
print('before del', dict)
dict.pop('Class')
print('after item delete', dict)
dict.clear()
print('after clear', dict)

Output
('before del', {'Class': 11, 'Subject': 'Informatics Practices'})
('after item delete', {'Subject': 'Informatics Practices'})
('after clear', {})

Built-in Dictionary Functions

S.No.	Function & Description
1	len(dict)Gives the total length of the dictionary. It is equal to the number of items in the dictionary. **dict = {'Name': 'Aman', 'Age': 37};** **print ("Length : %d" % len (dict))** **OUTPUT ->2**
2	str(dict)Return a printable string representation of a dictionary
3	type(variable)If variable is dictionary, then it would return a dictionary type.

Built-in Dictionary Methods

S.No.	Method & Description
1	dict() - creates dictionary x = dict(name = "Aman", age = 37, country = "India") Here x is created as dictionary
2	keys() - returns all the available keys x = dict(name = "Aman", age = 37, country = "India") print(x.keys()) OUTPUT->dict_keys(['country', 'age', 'name'])
3	values() - returns all the available values x = dict(name = "Aman", age = 37, country = "India") print(x.values()) OUTPUT->dict_values(['India', 37, 'Aman'])

Built-in Dictionary Methods

S.No.	Method & Description
4	items() – return the list with all dictionary keys with values. x = dict(name = "Aman", age = 37, country = "India") print(x.items()) OUTPUT->dict_items([('country', 'India'), ('age', 37), ('name', 'Aman')])
5	update()-used to change the values of a key and add new keys x = dict(name = "Aman", age = 37, country = "India") d1 = dict(age= 39) x.update(d1,state="Rajasthan") print(x) OUTPUT-{'country': 'India', 'age': 39,'name':'Aman','state': 'Rajasthan'}

Built-in Dictionary Methods

S.No.	Method & Description
6	del -used to remove key x = dict(name = "Aman", age = 37, country = "India") del x['age'] print(x) OUTPUT->{'country': 'India', 'name': 'Aman'} del x -> will remove complete dictionary
7	fromkeys() – is used to create dictionary from keys keys = {'a', 'e', 'i', 'o', 'u' } value ="Vowel" vowels = dict.fromkeys(keys, value) print(vowels) OUTPUT-> {'i': 'Vowel', 'u': 'Vowel', 'e': 'Vowel', 'a': 'Vowel', 'o': 'Vowel'}

Built-in Dictionary Methods

S.No.	Method & Description
8	copy() - returns a shallow copy of the dictionary. x = dict(name = "Aman", age = 37, country = "India") y=x.copy() print(y) print(id(x)) print(id(y)) OUTPUT - >{'country': 'India', 'age': 37, 'name': 'Aman'} 33047872 33047440
9	popitem() – removes last item from dictionary x = dict(name = "Aman", age = 37, country = "India") x.popitem() print(x) OUTPUT-> {'age': 37, 'name': 'Aman'}

Built-in Dictionary Methods

S.No.	Method & Description
10	setdefault() method returns the value of the item with the specified key. If the key does not exist, insert the key, with the specified value. x = dict(name = "Aman", country = "India") y=x.setdefault('age',39) print(y) OUTPUT-> 39
11	max() – returns key having maximum value Tv = {'a':100, 'b':1292, 'c' : 88} Keymax = max(Tv, key=Tv.get) print(Keymax) OUTPUT-> b
12	min()- returns key having minimum value

Built-in Dictionary Methods

S.No.	Method & Description
13	sorted- sort by key or value dict1 = {'b':100, 'a':12, 'c' : 88} y = sorted(dict1.items(),key=lambda x: x[1],reverse=True) print(y) OUTPUT-> [('b', 100), ('c', 88), ('a', 12)]

count the number of times a character appears in agiven string using a dictionary

input_string = "python.mykvs.in"
frequencies = {}
for char in input_string:
** if char in frequencies:**
**   frequencies[char] += 1**
** else:**
**   frequencies[char] = 1**
print ("Per char frequency in '{}' is :\n {}".format(input_string, str(frequencies)))

OUTPUT
Per char frequency in 'python.mykvs.in' is :
 {'i': 1, 'h': 1, 'k': 1, 'm': 1, 'o': 1, 'n': 2, 'p': 1, 's': 1, 't': 1, 'v': 1, 'y': 2, '.': 2}

create a dictionary with names of employees, their salary and access them

employees = {'Aman':{'salary':'10000'},'Mayur':{'salary':'51000'}}
employee1 = employees['Aman']
print(employee1)

OUTPUT
{'salary': '10000'}

Questions.

1. Create dictionary to store 4 student details with rollno,name,age field.Search student in list.

2. Create dictionary for month and noofdays for a year. User is asked to enter month name and system will show no of days of that month.