Dictionary

- **Dict items are enclosed in curly braces**
- **Dict items contains key, and value**
- **Dict keys need to be immutable (numbers, string, tuple) list not allowed**
- **Dict value can have any data types**
- **Dict keys need to be unique**
- **Dict is not ordered, you can access it's elements using its keys**

```
user = {
    "name": "osama",
    "age": 35,
    "gender": "male"
}

print(user)     # {'name': 'osama', 'age': 35, 'gender': 'male'}
print(user.keys())          # dict_keys(['name', 'age', 'gender'])
print(user.values())        # dict_values(['osama', 35, 'male'])
print(user.items())         # dict_items([('name', 'osama'), ('age', 35), ('gender',
'male')])
print(user.get("name"))     # osama

# two dimensional dictionary, also called nested dictionary
languages = {
    'one': {
        "name": "html",
        "progress": "90%",
        },
    'two': {
        "name": "css",
        "progress": "95%",
        },
    'three': {
        "name": "js",
        "progress": "85%",
        },
}

print(languages.keys())     # dict_keys(['one', 'two', 'three'])
print(languages["one"])     # {'name': 'html', 'progress': '90%'}
print(languages["one"]["name"])     # html
print(len(languages))   # 3
print(len(languages["one"]))        # 2
```

Dictionary Methods

```
# clear()
# - used to clear all items on the dictionary
user = {
    "name": "osama",
    "grade": "A+",
    "age": 35,
}
user.clear()
print(user)     # {}


# update()
# - used to update items in the dictionary
member = {
    "Name": "Osama",
}
print(member)       # {'Name': 'Osama'}
member.update( {"Country": "Egypt"} )   # {'Name': 'Osama', 'Country': 'Egypt'}
print(member)


# copy()
# - used to copy dictionary items to another dictionary
user_info = {
    "Name": "Osama",
    "Age": 35,
    "Gender": "Male",
}
USER_INFO = user_info.copy()
print(user_info)        # {'Name': 'Osama', 'Age': 35, 'Gender': 'Male'}
print(USER_INFO)        # {'Name': 'Osama', 'Age': 35, 'Gender': 'Male'}


# keys()
# get the keys of the dictionary
print(user_info.keys())     # dict_keys(['Name', 'Age', 'Gender'])

# values()
# - get the values of the dictionary
print(user_info.values())       # dict_values(['Osama', 35, 'Male'])



# setdefault()
# - used to search about the key
# - if the key exist that will get the value of the key
# - if the key not exist that will be written on the dictionary

# if the key exists
user = {
    "Name": "Osama",
}
print(user)     # {'Name': 'Osama'}
user.setdefault("Name", "Osama")
print(user)     # {'Name': 'Osama'}
```

```python
# if the key is not exist
# if not write the key, python will write it as "None"
member = {
    "Age": 35,
}
print(member)       # {'Age': 35}
member.setdefault("Name", "Osama")
print(member)       # {'Name': 'Mohamed', 'Age': 35}



user = {
    "Name": "Osama",
    "Age": 35,
    "Country": "Egypt",
}

# popitem()
# - this remove last element that exist on the dictionary
print(user)     # {'Name': 'Osama', 'Age': 35, 'Country': 'Egypt'}
print(user.popitem())       # ('Country', 'Egypt')
print(user)     # {'Name': 'Osama', 'Age': 35}


# items()
# - print all keys, values on the dictionary
print(user.items())     # dict_items([('Name', 'Osama'), ('Age', 35)])


# fromkeys()
# - make dictionary from variable, and iterable
# the keys will be random written in the dict
iterable_name =  {"key 1", "key 2", "key 3"}
KEY = 'x'
print(dict.fromkeys(iterable_name, KEY))    # {'key 3': 'x', 'key 1': 'x', 'key 2': 'x'}
```