Use the type constructor: dict(), dict([('foo', 100), ('bar', 200)]), dict(foo=100, bar=200).

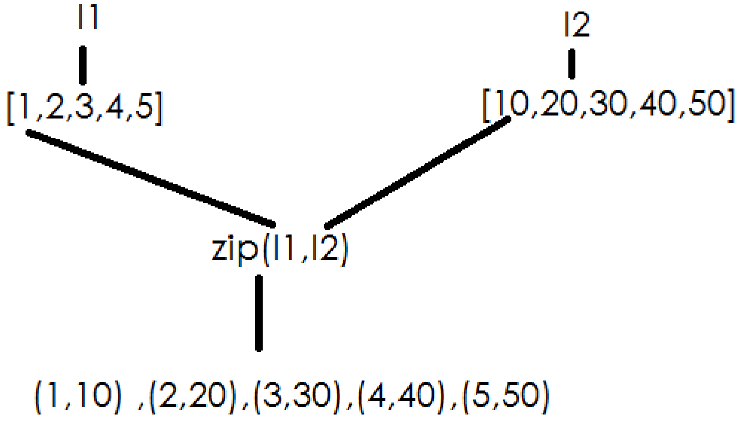
1. dict() → create empty dictionary
2. dict(iterable) → converting existing iterable into dictionary

```
>>> dict1=dict()
>>> print(dict1)
{}
>>> list1=[10,20,30,40,50]
dict2=dict(list1)
Traceback (most recent call last):
  File "<pyshell#3>", line 1, in <module>
    dict2=dict(list1)
TypeError: cannot convert dictionary update sequence element #0 to a
sequence
>>> list1=[(1,10),(2,20),(3,30),(4,40)]
>>> dict2=dict(list1)
>>> print(dict2)
{1: 10, 2: 20, 3: 30, 4: 40}
>>> list1=[10,20,30,40,50]
>>> e=enumerate(list1,1)
>>> dict3=dict(e)
>>> print(dict3)
{1: 10, 2: 20, 3: 30, 4: 40, 5: 50}
>>> l1=[1,2,3,4,5]
>>> l2=[10,20,30,40,50]
>>> z=zip(l1,l2)
>>> next(z)
(1, 10)
>>> next(z)
(2, 20)
>>> next(z)
(3, 30)
>>> z=zip(l1,l2)
>>> dict4=dict(z)
>>> print(dict4)
{1: 10, 2: 20, 3: 30, 4: 40, 5: 50}
>>> list1=[1,2,3,4,5]
>>> list2=[10,20,30]
>>> list3=list(zip(list1,list2))
>>> print(list3)
[(1, 10), (2, 20), (3, 30)]
>>> l1=[1,2,3]
>>> l2=[10,20,30]
>>> l3=[100,200,300]
>>> l4=list(zip(l1,l2,l3))
>>> print(l4)
[(1, 10, 100), (2, 20, 200), (3, 30, 300)]
>>> rollno=[1,2,3]
>>> names=['naresh','suresh','kishore']
>>> student_dict=dict(zip(rollno,names))
>>> print(student_dict)
{1: 'naresh', 2: 'suresh', 3: 'kishore'}
```

zip()

zip(*iterables)

Iterate over several iterables in parallel, producing tuples with an item from each one.



Mutable Operations of dictionary

1. d[key] = value

   Set d[key] to *value*.

This operation perform to things

1. add new item inside dictionary, if key not exists
2. modify value of existing key.

```
>>> dict1={}
>>> print(dict1)
{}
>>> dict1[1]=10
>>> dict1[2]=20
>>> dict1[3]=30
>>> print(dict1)
{1: 10, 2: 20, 3: 30}
>>> dict1[1]=99
>>> print(dict1)
{1: 99, 2: 20, 3: 30}
```

Example:

```
# write a program to create student dictionary with n items
# each item is having name and course

n=int(input("enter how many students?"))
stud_dict={}
for i in range(n):
    name=input("Enter Name ")
    course=input("Enter Course")
    stud_dict[name]=course

print(stud_dict)
```

Output:

```
enter how many students?3
Enter Name naresh
Enter Coursepython
Enter Name suresh
Enter Coursejava
Enter Name kishore
Enter Coursec
{'naresh': 'python', 'suresh': 'java', 'kishore': 'c'}
```

Example:
# write a program to create student_dict with n students
# each student is having name as key and subject marks as values

```
n=int(input("enter how many students"))
stud_dict={}
for i in range(n):
    name=input("enter name")
    marks=list(map(int,input("enter 2 sub marks").split()))
    if name not in stud_dict:
        stud_dict[name]=marks
    print(name,"is exists")

print(stud_dict)
```

Output

```
enter how many students2
enter namenaresh
enter 2 sub marks60 70
naresh is exists
enter namesuresh
enter 2 sub marks90 99
suresh is exists
{'naresh': [60, 70], 'suresh': [90, 99]}
```

How to read content of dictionary?

1. Using key
2. For loop
3. Using dictionary methods
    a. Keys()
    b. Values()
    c. Items()
    d. getitem()

using key

dictionary is key based collection, we can read value of dictionary using key.

Syntax: dictionary-name[key]

If key exists, it return value
If key not exists, it generate KeyError

Example:

```
courses_dict={'java':2000,
             'python':4000,
             'oracle':2000}
courses_dict['java']
2000
courses_dict['python']
4000
>>> courses_dict['oracle']
2000
>>> courses_dict['c']
Traceback (most recent call last):
  File "<pyshell#47>", line 1, in <module>
    courses_dict['c']
KeyError: 'c'
```

Example:

```
# Application
# 1. Signin
# 2. Signup

users_dict={}
while True:
    print("1.Signup")
    print("2.Signin")
    print("3.Exit")
    opt=int(input("enter your option"))
    if opt==1:
        uname=input("UserName :")
        pwd=input("Password :")
        if uname in users_dict:
            print(uname,"exists")
        else:
            users_dict[uname]=pwd
            print("user registered")
    elif opt==2:
        uname=input("UserName :")
        pwd=input("Password :")
        if uname in users_dict:
            p=users_dict[uname]
            if pwd==p:
                print(uname,"welcome")
            else:
                print("invalid password")
        else:
            print("invalid username")

    elif opt==3:
        break
```

Output:

```
1.Signup
2.Signin
3.Exit
enter your option1
UserName :naresh
Password :n123
user registered
1.Signup
2.Signin
3.Exit
enter your option2
UserName :naresh
Password :n123
naresh welcome
1.Signup
2.Signin
3.Exit
enter your option2
```

```
UserName :ramesh
Password :r123
invalid username
1.Signup
2.Signin
3.Exit
enter your option1
UserName :ramesh
Password :r123
user registered
1.Signup
2.Signin
3.Exit
enter your option1
UserName :naresh
Password :n123
naresh exists
1.Signup
2.Signin
3.Exit
enter your option2
UserName :naresh
Password :n321
invalid password
1.Signup
2.Signin
3.Exit
enter your option3
```