Dictionary is a mutable collection

How to add an item within dictionary?

Syntax:
dictionary-name[key]=value

This syntax performs two operations
1. Adding an item
2. Updating value of given key

If key not exists within dictionary, it add given key and value
If key exists within dictionary, it updates value of key

```
>>> d1={}
>>> d1[1]=10
>>> d1[2]=20
>>> d1[3]=30
>>> d1[4]=40
>>> print(d1)
{1: 10, 2: 20, 3: 30, 4: 40}
>>> d1[1]=99
>>> print(d1)
{1: 99, 2: 20, 3: 30, 4: 40}
>>> d1[5]=50
>>> print(d1)
{1: 99, 2: 20, 3: 30, 4: 40, 5: 50}
```

Example:

```
# Write a program to input details of n students
# each student having rollno,name,course
# store threse details into dictionary

students={}
n=int(input("How many students?"))
for i in range(n):
    rollno=int(input("Rollno :"))
    name=input("Name :")
    course=input("Course :")
    if rollno not in students:
```

```
        students[rollno]=[name,course]
    else:
        print(f'{rollno} is exists')

print(students)
```

Output

```
How many students?2
Rollno :1
Name :naresh
Course :python
Rollno :2
Name :rajesh
Course :java
{1: ['naresh', 'python'], 2: ['rajesh', 'java']}
```

Example:

```
# Write a program to read sales of n sales persons
# each sales person having name and sales
# calculate total sales, maximum sales, minimum sales

sales={}
n=int(input("How Many Sales Persons "))

for i in range(n):
    name=input("Enter Name ")
    s=float(input("Enter Sales "))
    if name not in sales:
        sales[name]=s

print(sales)
total=sum(sales.values())
print(f'Total Sales {total}')
max_sales=max(sales.values())
min_sales=min(sales.values())
print(f'Maximum sales {max_sales}')
print(f'Minimum sales {min_sales}')
max_s=0
res=None
for t in sales.items():
```

```
    if t[1]>max_s:
        max_s=t[1]
        res=t

print(res)
```

Output

```
How Many Sales Persons 2
Enter Name aaa
Enter Sales 4500
Enter Name bbb
Enter Sales 2000
{'aaa': 4500.0, 'bbb': 2000.0}
Total Sales 6500.0
Maximum sales 4500.0
Minimum sales 2000.0
('aaa', 4500.0)
```

How to delete an item from dictionary?

Dictionary items can be deleted using various approaches

1. Using del keyword
2. Using pop() method
3. Using popitem() method
4. Using clear() method

Using "del" keyword

"del" keyword is used to delete an item from directionary

Syntax: del dictionary-name[key]

If key exists, it deletes an item
If key not exists, it raises KeyError

```
>>> persons={'naresh':50,
...          'suresh':60,
...          'ramesh':30,
...          'kishore':25}
>>> print(persons)
{'naresh': 50, 'suresh': 60, 'ramesh': 30, 'kishore': 25}
```

```
>>> del persons['naresh']
>>> print(persons)
{'suresh': 60, 'ramesh': 30, 'kishore': 25}
>>> del persons['naresh']
Traceback (most recent call last):
  File "<pyshell#19>", line 1, in <module>
    del persons['naresh']
KeyError: 'naresh'
```

pop() method

pop method performs two operations

1. Read value
2. Delete

Syntax: variable-name=dictionary-name.pop(key,d)

If key exists, it returns value and delete
If key not exists, it returns default value, if default value is not given raises KeyError

Example:

```
>>> dict1={'a':'apple',
       'b':'ball',
       'c':'cat',
       'd':'dog'}
>>> print(dict1)
{'a': 'apple', 'b': 'ball', 'c': 'cat', 'd': 'dog'}
>>> var1=dict1.pop('z')
Traceback (most recent call last):
  File "<pyshell#25>", line 1, in <module>
    var1=dict1.pop('z')
KeyError: 'z'
>>> var1=dict1.pop('z',None)
>>> print(var1)
None
>>> var2=dict1.pop("e","egg")
>>> print(var2)
egg
>>> print(dict1)
{'a': 'apple', 'b': 'ball', 'c': 'cat', 'd': 'dog'}
```

```
>>> var3=dict1.pop('a')
>>> print(var3)
apple
>>> print(dict1)
{'b': 'ball', 'c': 'cat', 'd': 'dog'}
>>> var4=dict1.pop('d')
>>> print(var4)
dog
>>> print(dict1)
{'b': 'ball', 'c': 'cat'}
```

popitem()

This method is used to implement stack operation within dictionary
Stack uses LIFO (Last In First Out).

Syntax: variable-name=dictionary-name.popitem()

This method remove last item added within dictionary

```
>>> d1={1:'one',
    2:'two',
    3:'three',
    4:'four',
    5:'five'}
>>> print(d1)
{1: 'one', 2: 'two', 3: 'three', 4: 'four', 5: 'five'}
>>> item1=d1.popitem()
>>> print(item1)
(5, 'five')
>>> print(d1)
{1: 'one', 2: 'two', 3: 'three', 4: 'four'}
>>> item2=d1.popitem()
>>> print(item2)
(4, 'four')
>>> print(d1)
{1: 'one', 2: 'two', 3: 'three'}
```

clear() method

This method removes all the items from dictionary (OR) empty dictionary

Syntax: dictionary-name.clear()

```
>>> d1=dict(zip(range(1,6),range(10,60,10)))
>>> print(d1)
{1: 10, 2: 20, 3: 30, 4: 40, 5: 50}
>>> d1.clear()
>>> print(d1)
{}
```

Example:

```
# Contacts
contacts={}
while True:
    print("1.Add Contact")
    print("2.Update Contact")
    print("3.Removing Contact")
    print("4.Search Contact")
    print("5.List Contacts")
    print("6.Exit")
    opt=int(input("Enter Your Option :"))
    match(opt):
        case 1:
            name=input("Name :")
            if name not in contacts:
                mobile=int(input("MobileNo "))
                contacts[name]=mobile
                print("Contact Added...")
            else:
                print(f'{name} contact exists')
        case 2:
            name=input("Name :")
            if name in contacts:
                mobile=int(input("New MobileNo :"))
                contacts[name]=mobile
                print(f'{name} contact updated')
            else:
                print(f'{name} contact not exists')
        case 3:
```

```
            name=input("Name :")
            if name in contacts:
                del contacts[name]
                print(f'{name} contact deleted...')
            else:
                print(f'{name} contact not exists')
        case 4:
            name=input("Name ")
            if name in contacts:
                mobile=contacts[name]
                print(f'{name}===>{mobile}')
            else:
                print(f'{name} contact not exists')
        case 5:
            for name,mobile in contacts.items():
                print(f'{name}-->{mobile}')
        case 6:
            break
        case _:
            print("Invalid Option")
```

Output

```
1.Add Contact
2.Update Contact
3.Removing Contact
4.Search Contact
5.List Contacts
6.Exit
Enter Your Option :1
Name :naresh
MobileNo 4455677889
Contact Added...
1.Add Contact
2.Update Contact
3.Removing Contact
4.Search Contact
5.List Contacts
6.Exit
```

Adding and updating multiple items of dictionary