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AIM: To implement various dictionary operations in Python, including concatenation, checking emptiness, frequency counting, and computing totals.

HARDWARE & SOFTWARE REQUIREMENTS: Hardware:16GB RAM, Intel Processor(i9), Software: Python (Version 3.x), Google Colab (Cloud-based)

SYSTEM CONFIGURATION: Operating System: Windows 11, IDE: Google Colab

THEORY: Dictionaries in Python store key-value pairs and allow efficient lookup, insertion, and modification. Various operations like merging, frequency counting, and computing aggregated values can be performed using dictionary functions.

REFERENCES: Geeks for Geeks, Python Documentation: <https://docs.python.org/3/>

1. Write a program to create three dictionaries and concatenate them to create fourth dictionary.

```
d1={"a":1,"b":2,"c":3}
d2={"aa":10,"bb":20,"cc":30}
d3={"aaa":100,"bbb":200,"ccc":300}
conc=**d1,**d2,**d3}
print(conc)
```

```
{'a': 1, 'b': 2, 'c': 3, 'aa': 10, 'bb': 20, 'cc': 30, 'aaa': 100, 'bbb': 200, 'ccc': 300}
```

2. Write a program to check whether a dictionary is empty or not.

```
d = { }
if not d:
    print ("Empty Dictionary.")
print (bool(d))
```

```
Empty Dictionary.
False
```

3. Create a dictionary with dept no, employee roll no. and salary. Find out department wise min and maximum of salary.

```
dep={"IT":{"I100": 45000,"I101":50000,"I102":60000}, "HR":{"H101":70000,"H102":75000,"H103":65000}, "Fin":{"F101":50000,"F102":55000,"F103":60000}}
for dept, employees in dep.items():
    salary=list(employees.values())
    print("Dept:",dept,"Min. salary",min(salary),"Max. salary",max(salary))
```

```
Dept: IT Min. salary 45000 Max. salary 60000
Dept: HR Min. salary 65000 Max. salary 75000
Dept: Fin Min. salary 50000 Max. salary 60000
```

4. Write a program that reads a string from the keyboard and creates dictionary containing frequency of each character occurring in the string.

```
str="python"
freq={}
for char in str:
    if char in freq:
        freq[char]+=1
    else:
        freq[char]=1
print("Frequency is:",freq)
```

Frequency is: {'p': 1, 'y': 1, 't': 1, 'h': 1, 'o': 1, 'n': 1}

5. Create two dictionaries – one containing grocery items and their prices and another containing grocery items and quantity purchased.  
By using the values from these two dictionaries compute the total bill.

```
price={"chocolate": 100,"chips": 20,"biscuit": 70}
qty={"chocolate":2,"chips":3,"biscuit":1}
bill=0
for i in price:
    bill+=price[i]*qty.get(i,0)
print("Total:",bill)
```

Total: 330