

Data structures

List

```
# list with same data types
numbers=[1,2,3,4,5]
print(numbers)

[1, 2, 3, 4, 5]

#list with different data types
x=[1,3,45,9.0,"pushpa"]
print(x)

[1, 3, 45, 9.0, 'pushpa']
```

List operations *Accessing Items

```
print(numbers[0])
print(numbers[2])

1
3
```

Modifying items

```
# append
number=[1,3,6,"God",3.5]
number.append("pushpa")
number.append(10)
print(number)

[1, 3, 6, 'God', 3.5, 'pushpa', 10]

#insert
number.insert(2,4)
print(number)

[1, 3, 4, 6, 'God', 3.5, 'pushpa', 10]

# remove
number.remove("God")
print(number)

[1, 3, 4, 6, 3.5, 'pushpa', 10]

#pop
number.pop(1)
print(number)

[1, 4, 6, 3.5, 'pushpa', 10]
```

```

#len
x= [2.0,4,67,"hen","cat",8]
len(x)

6

#sort
y=["Apple","Bat","apple","bat"]
sorted(y)
x=[3,5,8,90,-20]
sorted(x)

[-20, 3, 5, 8, 90]

#Reverse
v=[4,90,89,67,3.9]
v.reverse()
print(v)

[3.9, 67, 89, 90, 4]

```

Iterating through a list

```

num2=[2,3,8,0,30]
for num2 in number:
    print(num2)

1
4
6
3.5
pushpa
10

```

Tuple

```

# creating tuples
coordinates=(10,20,40)
print(coordinates)

(10, 20, 40)

#Accessing Items in a tuple
print(coordinates[2])
print(coordinates)

40
(10, 20, 40)

```

Dictionary

```
# creating a dictionary
student={"name":"pushpa",
        "age":17,
        "class":"engineering"}
print(student)

{'name': 'pushpa', 'age': 17, 'class': 'engineering'}
```

Modifying items

```
#modify
student["class"] = "B.tech"
print(student)

{'name': 'pushpa', 'age': 17, 'class': 'B.tech'}

#adding
student["section"]="G"
print(student)

{'name': 'pushpa', 'age': 17, 'class': 'B.tech', 'section': 'G'}

#removing
del student["age"]
print(student)

{'name': 'pushpa', 'class': 'B.tech', 'section': 'G'}

# Iterating Through a Dictionary
student1={"name":"XYZ","Grade":"A","Age":13}
for key,value in student1.items():
    print(key,value)

name XYZ
Grade A
Age 13
```

Set

```
# creating set
b={1,2,4,8,0}
b

{0, 1, 2, 4, 8}

#adding
b.add(9)
b

{0, 1, 2, 4, 8, 9}
```

```

#removing items
b.remove(2)
b

{0, 1, 4, 8, 9}

# union set
a={1,2,3,4,5}
b={2,4,98,90}
a.union(b)

{1, 2, 3, 4, 5, 90, 98}

# intersection set
v={1,3,90,100,67}
n={1,3,90,100}
v.intersection(n)

{1, 3, 90, 100}

# difference
v.difference(n)

{67}

```

1.Manipulating list

```

fruits=["apple","banana","cherry"]
fruits.append("orange")
fruits.remove("banana")
fruits.insert(1,"kiwi")
fruits

['apple', 'kiwi', 'cherry', 'orange']

```

Creating a dictionary

```

book={ "title":"python basic","author":"John Doe","year":2021}
print(book["title"])
book["year"]=2022
book

python basic

{'title': 'python basic', 'author': 'John Doe', 'year': 2022}

```

working set

```

set1={1,2,3,4,4}
set2={3,4,5,6,7,8,2}

```

```
print("Union:",set1 | set2)
print("Intersection", set1 & set2)
print("Difference:",set1 - set2)
```

```
Union: {1, 2, 3, 4, 5, 6, 7, 8}
Intersection {2, 3, 4}
Difference: {1}
```

Merge two numbers

```
list1=[1,2,3]
list2=[4,5,6]
merge_list=list1+list2
print(merge_list)
```

```
[1, 2, 3, 4, 5, 6]
```

Maximum and minimum

```
numbers=[10,20,30,40,50,60]
print("Maximum:",max(numbers))
print("Minimum:",min(numbers))
```

```
Maximum: 60
Minimum: 10
```

Count Frequency of Element in a list

```
numbers=[1,2,2,3,3,3,4,4,4,4]
frequency = {}
for num in numbers:
    frequency[num]=frequency.get(num,0) +1
print("Frequency of element:",frequency)
```

```
Frequency of element: {1: 1, 2: 2, 3: 3, 4: 4}
```

sort a list of tuple by second element

```
tuples=[(1,"apple"),(2,"banana"),(3,"cherry")]
sorted_tuples=sorted(tuples,key=lambda x:x[1])
print("sorted tuples:", sorted_tuples)

sorted tuples: [(1, 'apple'), (2, 'banana'), (3, 'cherry')]
```