**Tuple Data Structure**

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a = 12

b = 12,24,36,48

-> Tuple is one of the collection data structure.

When we want to define a variable with more than one value, we can allow to collections like "Tuple".

**How to define the tuple:**

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v1 = 23

print(v1)

# tuple can be defined with ()

v2 = ()

v3 = (1,2,3,4,5,6,1.2,2.3,2-3j,True)

v4 = (1,3,4,5,7)

# tuple is homogeneous and also heterogeneous

# is it possible to define the tuple without ()?

v5 = 1,2,3,4,5

# is it possible to define the tuple with single element?

v6 = (100,)

v7 = 200,

# is it possible to create the empty tuple without ()?

v8 = tuple()

v9 = tuple([12,23,34,45])

v10 = tuple("string")

print(type(v2))

print(type(v3))

print(type(v4))

print(type(v5))

print(type(v6))

print(type(v7))

print(type(v8))

print(type(v9))

print(type(v10))

**Accessing of tuple data:**

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-> Indexing and slicing

# tuple is ordered

x = tuple("String")

print(x)

print(x[0])

print(x[1])

print(x[2])

print(x[-1])

print(x[-2])

print(x[::-1])

**Looping on Tuple:**

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t = 11,'apple',1-23j,True,23.32

for i in t:

 print(i,end = "\t")

# tuple is immutable

# after the definition, no modification is allowed on the tuple.

# t[0] = 22

print(t)

# is any way to modify the tuple?

# list()

l = list(t) # convert the tuple into list

print(l)

l[0] = 22 # define the modification

t = tuple(l) # convert the list into tuple

print(t)

**Methods of Tuple:**

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1) len() ==> used to find the length of the tuple.

Syntax:

 len(tuple-name)

2) count():

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-> return the number of occurrences of the specified element within the tuple.

Syntax:

 tuple-name.count(element)

3) index():

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-> to get the index of the specified element, we can use "index()".

Syntax:

 tuple-name.index(element)

4) sorted()

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-> to sort the tuple, we can use "sorted()"

t = (11,22,33,44,55,55,44,33,22,11,10,20,11,22)

print(len(t))

print(t.count(11))

print(t.count(100))

print(t.index(10))

# print(t.index(100))

print(t.index(22)) # first occurrence

print(sorted(t))

print(sorted(t,reverse = True))