# Python Programming

EDUCATION FOR PEACE

(ESTD-1995)

## RGM College of Engineering & Technology (Autonomous)

Department of Computer Science & Engineering

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# TUPLE DATA TYPE

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# Learning Mantra

**If you really strong in the basics, then remaining things will become so easy.**

# Agenda:

1. Tuple Packing and Unpacking
2. Tuple Comprehension

# 7. Tuple Packing and Unpacking

**Tuple packing:**

- We can create a tuple by packing a group of variables.

**Eg:**

```
a=10
b=20
c=30
d=40
t=a,b,c,d
print(t)                #(10, 20, 30, 40)
```

Here a,b,c,d are packed into a tuple t. This is nothing but **tuple packing.**

**Tuple unpacking :**

- Tuple unpacking is the reverse process of tuple packing.
- We can unpack a tuple and assign its values to different variables.

**Eg:**

```
t=(10,20,30,40)
a,b,c,d=t
print("a=",a,"b=",b,"c=",c,"d=",d)
```

**Output:** a= 10 b= 20 c= 30 d= 40

**Note:** This concept is also applicable for any sequence (i.e., string, list, set etc.,) concept also.

**List Unpacking:**

**Eg:**

```
t=[10,20,30,40]

a,b,c,d=t

print("a=",a,"b=",b,"c=",c,"d=",d)
```

**Output:**

```
a= 10 b= 20 c= 30 d= 40
```

## Set Unpacking:

**Eg:**

```
t={10,20,30,40}

a,b,c,d=t

print("a=",a,"b=",b,"c=",c,"d=",d)
```

**Output:**

```
a= 40 b= 10 c= 20 d= 30
```

## String Unpacking:

**Eg:**

```
t='abcd'

a,b,c,d=t

print("a=",a,"b=",b,"c=",c,"d=",d)
```

**Output:**

```
a= a b= b c= c d= d
```

**List Packing:**

**Eg:**

```
a = 10
b = 20
c = 30
d = 40
t =[a,b,c,d]
print(type(t))
print(t)
```

**Output:**

```
<class 'list'>
[10, 20, 30, 40]
```

**Set Packing:**

**Eg:**

```
a = 10

b = 20

c = 30

d = 40

t ={a,b,c,d}            # for 'set' order is not important

print(type(t))

print(t)
```

**Output:**

```
<class 'set'>

{40, 10, 20, 30}
```

**String Packing:**

**Eg:**

```
a = 10

b = 20

c = 30

d = 40

t ='a,b,c,d'

print(type(t))

print(t)
```

**Output:**

```
<class 'str'>

a,b,c,d
```

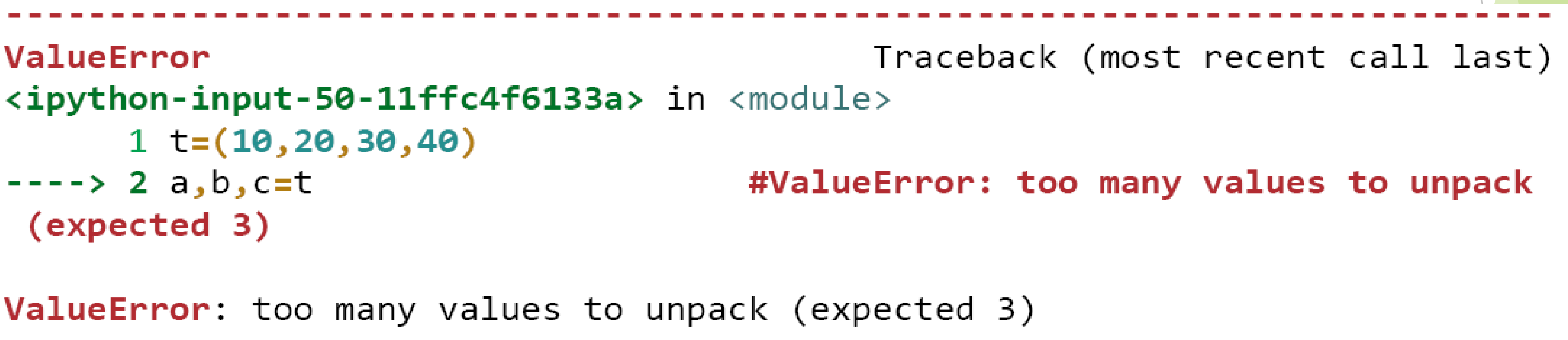
**Note:**

- At the time of tuple unpacking the number of variables and number of values should be same, otherwise we will get **ValueError**.

**Eg :**

t=(10,20,30,40)

a,b,c=t        # ValueError: too many values to unpack (expected 3)



```
---------------------------------------------------------------------------
ValueError                                Traceback (most recent call last)
<ipython-input-50-11ffc4f6133a> in <module>
      1 t=(10,20,30,40)
----> 2 a,b,c=t                    #ValueError: too many values to unpack
 (expected 3)

ValueError: too many values to unpack (expected 3)
```

# 8. Tuple Comprehension

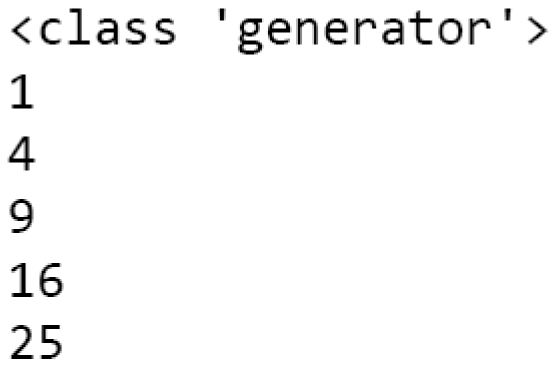
- Tuple Comprehension is not supported by Python.

```
t= ( x**2 for x in range(1,6))
```

Here we are not getting tuple object and we are getting **generator** object.

**Eg:**

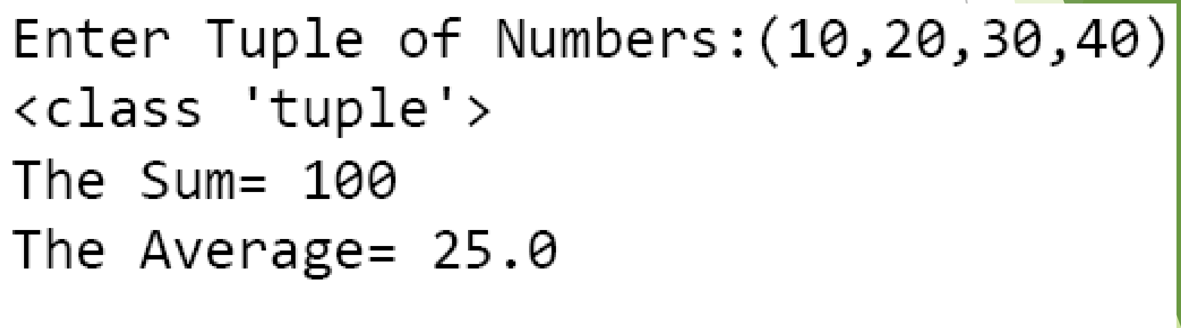
```
t= ( x**2 for x in range(1,6))

print(type(t))

for x in t:

    print(x)
```



```
<class 'generator'>
1
4
9
16
25
```

**Q. Write a Python program to take a tuple of numbers from the keyboard and print its sum and average.**

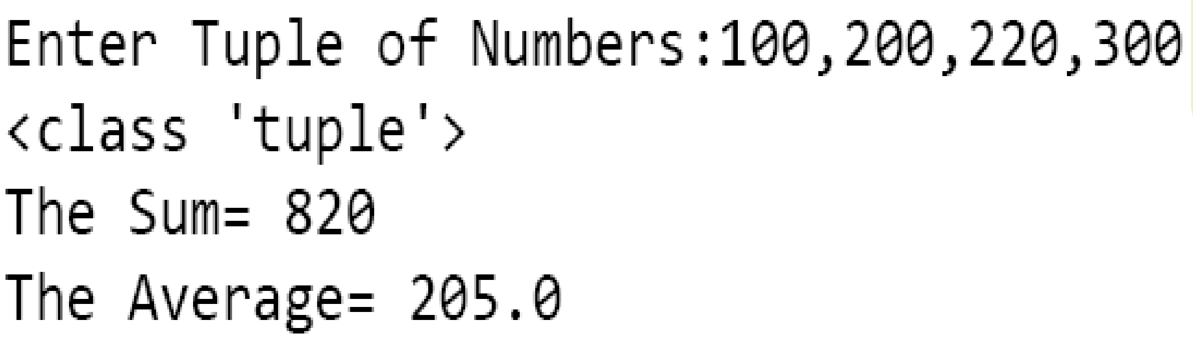
```
t=eval(input("Enter Tuple of Numbers:"))
print(type(t))
l=len(t)
sum=0
for x in t:
    sum = sum + x
print("The Sum=",sum)
print("The Average=",sum/l)
```



```
Enter Tuple of Numbers:(10,20,30,40)
<class 'tuple'>
The Sum= 100
The Average= 25.0
```

**Eg:**

```
t=eval(input("Enter Tuple of Numbers:"))
print(type(t))
l=len(t)
sum=0
for x in t:
sum = sum + x
print("The Sum=",sum)
print("The Average=",sum/l)
```



```
Enter Tuple of Numbers:100,200,220,300
<class 'tuple'>
The Sum= 820
The Average= 205.0
```

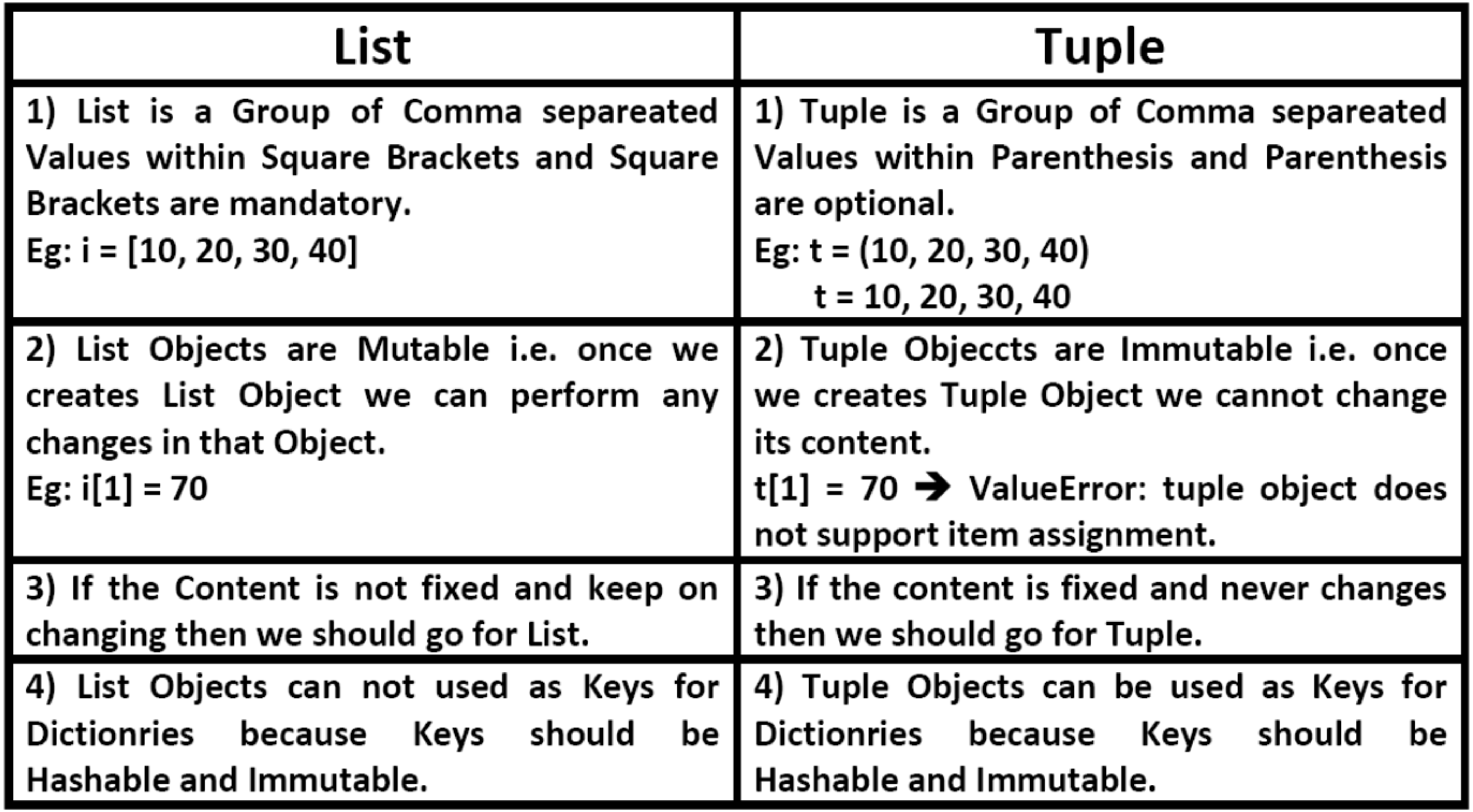
# 9. Differences between List and Tuple

**List and Tuple are exactly same except small difference:**

- List objects are mutable where as Tuple objects are immutable.

**Similarities of List and Tuple:**

- Insertion order is preserved.
- Duplicate objects are allowed.
- Heterogeneous objects are allowed.
- Index and Slicing are supported.



| List | Tuple |
|---|---|
| 1) List is a Group of Comma separeated Values within Square Brackets and Square Brackets are mandatory.<br>Eg: i = [10, 20, 30, 40] | 1) Tuple is a Group of Comma separeated Values within Parenthesis and Parenthesis are optional.<br>Eg: t = (10, 20, 30, 40)<br>t = 10, 20, 30, 40 |
| 2) List Objects are Mutable i.e. once we creates List Object we can perform any changes in that Object.<br>Eg: i[1] = 70 | 2) Tuple Objeccts are Immutable i.e. once we creates Tuple Object we cannot change its content.<br>t[1] = 70 ➔ ValueError: tuple object does not support item assignment. |
| 3) If the Content is not fixed and keep on changing then we should go for List. | 3) If the content is fixed and never changes then we should go for Tuple. |
| 4) List Objects can not used as Keys for Dictionries because Keys should be Hashable and Immutable. | 4) Tuple Objects can be used as Keys for Dictionries because Keys should be Hashable and Immutable. |

# Any question?

If you try to practice programs yourself, then you will learn many things automatically

Spend few minutes and then enjoy the study

# Thank You