## Insert, Modify and Delete tuple elements

As we know, the tuple is an immutable data-type and therefore, we can't directly insert an element into it, modify its contents nor delete an element from it. However, we can accomplish these tasks by creating a new tuple as illustrated below.

## Insert an element into a tuple

Let us consider 'tup' as an existing tuple in which a new element has to be inserted. We have to create a new tuple 'Ntup' to insert an element into the tuple 'tup' as depicted below.

- Suppose a new element 'a' needs to be inserted at a position 'pos' of the existing tuple 'tup'
- Copy all the elements of 'tup' from the positions 1 to pos–1 (indices 0 to pos–2) into new tuple 'Ntup'.

  **Ntup = tup[0 : pos–1]**
- Add / concatenate the new element 'a' to the new tuple 'Ntup'.

  **Ntup = Ntup + a**
- Add / concatenate all the remaining elements (from pos–1 ) of the existing tuple 'tup' to the new tuple 'Ntup'.

  **Ntup = Ntup + tup[pos–1:]**

Let us take a tuple 'tup' with 5 elements as given below.

**tup = (10,20,40,50,60)**

The new element 30 has to be inserted at position 3(index 2). To accomplish this task, elements from the positions 1 to 2 ((indices 0 to 1) of the tuple 'tup' have to be copied into the new tuple 'Ntup'.

**Ntup = tup[0:2] = (10,20)**

Then, add the element 30 into Ntup.

**Ntup = Ntup + 30 = (10,20,30)**

Finally, copy the remaining elements from the position 3 (index 2) of the 'tup' into 'Ntup'.

**Ntup = Ntup + tup[2:] = (10,20,30,40,50,60)**

```
#Python code to insert a new element in a tuple
TupStr = ('Kriyansh','Arvind', 'Sruti','Swati')
print('Original tuple  : ',TupStr)
#accept new name and position
Name =[input('Enter a new name : ')]
NewName = tuple(Name)
Pos = int(input('Enter position : '))
#copy elements of TupStr from 0 to pos-2 into new tuple NewTup
NewTup = TupStr[0:Pos-1]
#Add the new name at pos–1
NewTup = NewTup + NewName
#copy the remaining elements from pos–1  into new tuple NewTup
TupStr = NewTup + TupStr[Pos-1:]
print('New tuple  : ',TupStr)
```

The output of this code will be

```
Original tuple  :  ('Kriyansh', 'Arvind', 'Sruti', 'Swati')
Enter a new name : Krishant
Enter position : 2
New tuple  :  ('Kriyansh', 'Krishant', 'Arvind', 'Sruti', 'Swati')
```

## Modify / replace elements of a tuple

As we discussed in the previous code to insert a new element in a tuple, we have to create a new tuple to replace an element of a tuple. The steps as listed below need to be followed to modify the tuple.

- Suppose an element of an existing tuple ‘tup’ has to replaced with new element ‘a’ at a position ‘pos’ .
- Copy all the elements of ‘tup’ from the positions 1 to pos–1 (indices 0 to pos–2) into new tuple ‘Ntup’.

  **Ntup = tup[0 : pos–1]**
- Add / concatenate the new element ‘a’ to the new tuple ‘Ntup’.

  **Ntup = Ntup + a**
- Now, add / concatenate all the remaining elements (from pos) of the tuple ‘tup‘ by eliminating the element at pos-1 to the new tuple ‘Ntup’.

  **Ntup = Ntup + tup[pos:]**

Let us take a tuple ‘tup’ with 6 elements as given below.

**tup = (10,20,30,40,50,60)**

The element 30 at position 3(index 2) has to be replaced with the new element 35. To accomplish this task, elements from the positions 1 to 2 ((indices 0 to 1) of the tuple ‘tup’ have to be copied into new tuple ‘Ntup’.

**Ntup = tup[0:2] = (10,20)**

Then, add the element 35 into Ntup.

**Ntup = Ntup + 35 = (10,20,35)**

Finally, copy the remaining elements from the position 4 (index 3) of the ‘tup’ into ‘Ntup’.

**Ntup = Ntup + tup[3:] = (10,20,35,40,50,60)**

```
#Python code to replace an element in a tuple
#create a tuple
n = int(input('Enter number of elements : '))
Tup = tuple()
for i in range(n):
   print('Enter element ',i+1,end=' : ')
   ele = int(input())
   Tup += (ele,)
print('Given tuple : ',Tup)

#Enter a number and position
Num =[int(input('\nEnter a number : '))]
NewNum = tuple(Num)
Pos = int(input('Enter position : '))

#Copy elements from 0 to pos – 2 into new tuple
NewTup = Tup[0:Pos-1]

#Add / concatenate the number at pos – 1
NewTup = NewTup + NewNum

#Copy the remaining elements from the position pos into new tuple
NewTup = NewTup + Tup[Pos:]

print('\nNew tuple  : ',NewTup)
```

OUTPUT

```
Enter number of elements : 5
Enter element  1 : 11
Enter element  2 : 22
Enter element  3 : 33
Enter element  4 : 44
Enter element  5 : 55
Given tuple :  (11, 22, 33, 44, 55)

Enter a number : 45
Enter position : 4

New tuple  :  (11, 22, 33, 45, 55)
```

## Deleting an element from the tuple

The easiest method to delete an element from a tuple is to copy all the elements except the element to be deleted into a new tuple. To carry out the deletion, we have to just enter the position of the element ‘pos’ which needs to be deleted. The following steps illustrate the logic involved while deleting an element from the tuple.

- Copy all the elements from 0th position to pos – 2 of the existing tuple ‘tup’ into a new tuple ‘Ntup’.
- Then, add / concatenate the remaining elements from tuple ‘tup’ by eliminating the element at the position pos – 1 into the tuple ‘Ntup’.

```
#Python code to delete an element from a tuple

#Create the tuple
n = int(input('Enter number of elements : '))
Tup = tuple()
for i in range(n):
    print('Enter element ',i+1,end=' : ')
    ele = int(input())
    Tup += (ele,)
print('\nGiven tuple : ',Tup)

#Enter the position of the element to be deleted
Pos = int(input('\nEnter position : '))

#Copy all the elements from position 0 to pos - 1
#into a new tuple
NewTup = Tup[0:Pos-1]

#Copy the remaining elements from position pos
#into a new tuple
NewTup = NewTup + Tup[Pos:]

print('\nNew tuple  : ',NewTup)
```

### OUTPUT

```
Enter number of elements : 6

Enter element  1 : 10
Enter element  2 : 20
Enter element  3 : 30
Enter element  4 : 40
Enter element  5 : 50
Enter element  6 : 60

Given tuple :  (10, 20, 30, 40, 50, 60)

Enter position : 4

New tuple  :  (10, 20, 30, 50, 60)
```

### Linear search

It is a process of searching an element from a tuple. If the element is found, then search is successful, otherwise the search is unsuccessful.

```
#Python code
#To read a n elemets for a tuple
#and search an element from the tuple

n = int(input('Enter number of elements : '))
tup = tuple()

for i in range(n):
    print('Enter element ',i+1,end=' : ')
    ele = int(input())
    tup += (ele,)

print('\nGiven tuple : ',tup)
ele = int(input('\nEnter element to be searched : '))
flag = 0

for i in range(n):
    if tup[i] == ele:
        flag = i + 1
        break
```

```
if flag != 0:
    print('The element ', ele, ' is found at location : ',flag)
else:
    print('The element ', ele, ' is not found ')
```

**OUTPUT**

```
Enter number of elements : 6

Enter element  1 : 2
Enter element  2 : 4
Enter element  3 : 6
Enter element  4 : 7
Enter element  5 : 8
Enter element  6 : 9

Given tuple :  (2, 4, 6, 7, 8, 9)

Enter element to be searched : 4

The element  4  is found at location :  2
```

**OUTPUT**

```
Enter number of elements : 5

Enter element  1 : 2
Enter element  2 : 4
Enter element  3 : 6
Enter element  4 : 8
Enter element  5 : 9

Given tuple :  (2, 4, 6, 8, 9)

Enter element to be searched : 7

The element 7 is not found
```

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