

```
#####
Starting at 9:05 pm
Enjoy the song : )
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```

- What is a List ?
- Creating List
- Indexing & Slicing in a List
- Updating
- Iteration in a List
- Methods in a List
- How to take List as input?
- Right Shift an Array

## What is a List?

```
# A list is an ordered mutable collection of items.
# Mixed datatypes in the list
empty=[]
nums=[1,2,3,4,5]
mixed=["a",10,3.13,True]
    # 0   1   2   3

# 1. Mutable -> you can update, insert, delete
# 2. Heterogeneous -> can hold different data types
# 3. Ordered -> Indices starting with 0
```

## Creating List

```
colors=["red", "green", "blue"]

# create a list with number 1 to 10
first_ten=list(range(1,11)) #list(range(1-10)) -> [1,2,3,4,5,6,7,8,9,10]
print(first_ten)

#given string and I want list of characters of the string
char=list("abcd") #['a','b','c','d']
print(char)

#Iterable -> something on which we can iterate, ex string, range, tuple, set
#Iterator -> for, list

#duplication
zeros = [0] *10
print(zeros)
```

```
→ [1, 2, 3, 4, 5, 6, 7, 8, 9, 10]
  ['a', 'b', 'c', 'd']
  [0, 0, 0, 0, 0, 0, 0, 0, 0]
```

## Indexing in a List

```
students=["yashwanth", "Nikhil", "Rithika","Akhil","Priyanka"]
#          0           1           2           3           4
#         -5          -4          -3          -2          -1
print(students)
print(students[1])
print(students[4])
#print(students[5]) #Error -> index out of bound
print(students[-1])
print(students[-4])
print(students[1][5])
print(students[-1][0])
print(students[-4][5])
```

```
→ ['yashwanth', 'Nikhil', 'Rithika', 'Akhil', 'Priyanka']
Nikhil
Priyanka
Priyanka
Nikhil
l
P
l
```

```
#Quiz 1
colors = ["red", "green", "blue", "yellow"]
print(colors[-2][1]) # blue -> 0 - b, 1 - l, 2 - u, 3 - e
```

```
→ l
```

## Slicing in a List

```
#list_name[start:end:jump]

nums=list(range(11))
print(nums)
print(nums[1:5]) #[1, 2, 3, 4] list_name[start:end]
print(nums[:5]) #[0, 1, 2, 3, 4] default start=0
print(nums[1:]) #[1, 2, 3, 4, 5, 6, 7, 8, 9, 10] default end=n-1
print(nums[:]) #full list
print(nums[::-2]) #even numbers
print(nums[1::2]) #odd numbers
print(nums[::-1]) #reverse list
print(nums[1:12]) #instead of giving error, it will only go till the existing ind
```

```
→ [0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10]
  [1, 2, 3, 4]
  [0, 1, 2, 3, 4]
```

```
[1, 2, 3, 4, 5, 6, 7, 8, 9, 10]
[0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10]
[0, 2, 4, 6, 8, 10]
[1, 3, 5, 7, 9]
[10, 9, 8, 7, 6, 5, 4, 3, 2, 1, 0]
[1, 2, 3, 4, 5, 6, 7, 8, 9, 10]
```

```
#Quiz 2
nums = [0, 1, 2, 3]
#      0 1 2 3
print(nums[2:100])
```

→ [2, 3]

## Updating an Index in A List

```
print(students)
print(students[1])
students[1]="Mahesh"
print(students)
students[3]="raja"
students[4]="Anvesh"
print(students)
```

→ ['yashwanth', 'Mahesh', 'Rithika', 'Akhil', 'Priyanka']
Mahesh
['yashwanth', 'Mahesh', 'Rithika', 'Akhil', 'Priyanka']
['yashwanth', 'Mahesh', 'Rithika', 'raja', 'Anvesh']

```
#Quiz 3
li = [10, 20, 30] # -> [10, 30, 30]
#      0 1 2
li[1] = li[1] + li[0]
#li[1] = 20 + 10 = 30
#lis[1] = 30
print(li)
```

→ [10, 30, 30]

## Iteration in a List

```
print(students)

# by value
for name in students:
    print(name)

→ ['yashwanth', 'Mahesh', 'Rithika', 'raja', 'Anvesh']
yashwanth
Mahesh
Rithika
raja
```

Anvesh

```
# by index
# len(list_name) -> gives you length of the list
for i in range(len(students)): # range(5) -> [0,1,2,3,4]
    print(i,students[i])
```

```
# 0 yashwanth
# 1 Mahesh
```

→ 0 yashwanth  
 1 Mahesh  
 2 Rithika  
 3 raja  
 4 Anvesh

```
#membership check
print("Mahesh" in students)
print("mahesh" in students)
```

→ True  
 False

```
#Quiz 4
a = list("123") # list("123") -> ["1","2","3"] -> len(a) = 3
b = [123] # [123] -> len(b) -> 1
print(len(a), len(b))
```

→ 3 1

```
#Quiz 5
names = ["A", "B", "C"]
#      0   1   2
#      -3  -2  -1
if "B" in names: # True
    for i in range(len(names)-1, -1, -1): #range(2,-1,-1) -> from 2 to 0
        print(names[i], end='')
```

→ CBA

Break: 10:17 – 10:27 pm

## Some Methods in a List

```
#append: add one item at a time at the last of a list
li=[1,2,3]
li.append(4)
print(li)
li.append([5,6,7,8,9,10])
print(li) #[1, 2, 3, 4, [5, 6, 7, 8, 9, 10]] nested list
```

```
→ [1, 2, 3, 4]
[1, 2, 3, 4, [5, 6, 7, 8, 9, 10]]
```

```
#extend: add many items from another iterable
lis=[1,2,3]
#lis.extend(4) # 4 is not a list
lis.extend([5,6,7,8,9,10,"a",True])
print(lis)
```

```
→ [1, 2, 3, 5, 6, 7, 8, 9, 10, 'a', True]
```

```
#insert: add before an index lis_name.insert(index, value)
print(lis)
lis.insert(1,0)
lis.insert(4,3.45)
lis.insert(2,"bhargav")
print(lis)
```

```
→ [1, 2, 3, 5, 6, 7, 8, 9, 10, 'a', True]
[1, 0, 'bhargav', 2, 3, 3.45, 5, 6, 7, 8, 9, 10, 'a', True]
```

```
#pop: remove the value and return the value (default is last)
li=[1,2,3]
x=li.pop() # 3
print(x)
print(li)
x=li.pop(1) #pop(index_which_i_want_to_remove)
print(x)
print(li)
```

```
→ 3
[1, 2]
2
[1]
```

```
#remove: removes first matching value and doesnt return anything
li=[1,2,1,3,4,1]
li.remove(1) #remove(value)
print(li)
li.remove(5) #error
```

```
→ [2, 1, 3, 4, 1]
```

---

```
-----  
ValueError Traceback (most recent call last)  
/tmp/ipython-input-3159962232.py in <cell line: 0>()  
      3 li.remove(1) #remove(value)  
      4 print(li)  
----> 5 li.remove(5)
```

**ValueError:** list.remove(x): x not in list

Next steps: [Explain error](#)

```
#count of value
li=[1,2,2,2,2,2,2,3]
print(li.count(2))
#index of value
print(li.index(3))
```

→ 7  
8

```
#len -> length of list
print(len(li))
```

→ 9

```
#sort
nums=[6,3,7,9,1,2,9]
nums.sort() #sorts in ascending
print(nums)
nums.sort(reverse=True)#sorts in descending
print(nums)
```

```
#reverse simply reverses the list
n=[4,5,2,1]
n.reverse()
print(n)
```

→ [1, 2, 3, 6, 7, 9, 9]  
[9, 9, 7, 6, 3, 2, 1]  
[1, 2, 5, 4]

```
#copy
b=n.copy()
print(b)
```

```
#clear
n.clear() #[]
print(n)
```

→ [1, 2, 5, 4]  
[]

```
#Quiz 6
li = [1, 2, 3]
li.append('4') #[1, 2, 3, '4']
print(li)
```

→ [1, 2, 3, '4']

```
#Quiz 7
li = [1, 2]
print(li.pop())
```

→ 2

```
#Quiz 8
li = [1, 3, 4]
li.insert(0, 2) #[2, 1, 3, 4]
print(li)
```

→ [2, 1, 3, 4]

```
#Quiz 9
li = [1, 2]
print(li.remove(2)) #remove returns nothing
```

→ None

```
#Quiz 10
a = [1, 2]
a.extend([3]) # [1, 2, 3]
a.append([4]) # [1, 2, 3, [4]]
print(a)
```

→ [1, 2, 3, [4]]

```
# + Operator
a=[1,2,3]
b=[4,5,6]
c=a+b #create a new list by concatenating the 2 lists
print(c)
```

→ [1, 2, 3, 4, 5, 6]

## How to take List as Input?

```
n=int(input()) #size of the list
a=[] #empty list

for i in range(n):
    item=input()
    a.append(item)

print(a)
```

→ 5  
a  
b  
c  
d  
e

```
['a', 'b', 'c', 'd', 'e']
```

```
s="I-love-scaler" #["I","love","scaler"]
li=s.split('-') #default split()
print(li)
```

```
→ ['I', 'love', 'scaler']
```

```
s=input()
li=s.split()
print(li)
```

```
→ a b e d
['a', 'b', 'e', 'd']
```

```
#Quiz 11
n = int(input()) # 3
nums = input().split() #['10','20','30']
nums[0] = int(nums[0]) + 5 #nums[0]=int('10')+5=10+5=15
print(nums)
```

```
→ 5
10 20 30
[15, '20', '30']
```

```
#doubts
#why can't we take b=a instead of b = a.copy?
b=a # both a and b are pointing to the same location
b = a.copy #create a new copy with diff location
```

```
n=["1 2 3 56 9" ]
n=[1, 2, 3, 56, 9 ]
```