Lists & Tuples

Lists

1. Initializing a list
2. Accessing elements of a list & Slicing a list
3. Adding elements to the list
    - append
    - insert
    - extend
4. user input - lists
5. Updating list items (single/multiple items)
6. Remove, Del, Clear, Pop
7. List Comprehensions

```
# initializing a list

l = []
print(l)
```

```
[]
```

```
l = list()
print(l)
```

```
[]
```

```
l = list(" ")
print(l)
print(l[0])
```

```
[' ']
```

```
l = list("")
print(l)
```

```
[]
```

```
t = tuple()
l = list(t)
print(l)
```

```
[]
```

```
name = "Virat Kohli"

l = list(name)
print(l)
```

```
['V', 'i', 'r', 'a', 't', ' ', 'K', 'o', 'h', 'l', 'i']
```

```
# accessing a list

l = [1,2,3,"a","b","c","rcb","gate","da"]

print(l[4])
print(l[-4])
```

```
b
c
```

```
l = [[1,2,3,[4,5]],[23,[12,34],9],30,21]

print(len(l))
```

```
4
```

```
l = [[1,2,3,[4,5]],[23,[12,34],9],30,21]
print(l[0][3][0])
print(l[0][3][-2])
```

```
4
4
```

```
print(l[0])
print(l[-4])
print(l[0][3])
print(l[-4][3])
print(l[0][-1])
print(l[-4][-1])
```

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

```
# slicing a list

l = ["sachin", "sehwag", "gauti", "virat", "yuvi", "raina","dhoni", "yousuf", "zaheer", "bumrah"]

print(len(l))
```

```
10
```

```
l[-4:2]
```

```
alpha = ['a', 'b','c','d','e','f','g','h','i','j']

print(alpha[-4:8])
print(alpha[-4:-8])
```

```
['g', 'h']
[]
```

```
l[6:1:-3]
```

```
['dhoni', 'virat']
```

```
l[6:2:-1]
```

```
['dhoni', 'raina', 'yuvi', 'virat']
```

```
l[::-1]
```

```
['bumrah',
 'zaheer',
 'yousuf',
 'dhoni',
 'raina',
 'yuvi',
 'virat',
```

```
        'gauti',
        'sehwag',
        'sachin']
```

```
l[::]
```

```
['sachin',
 'sehwag',
 'gauti',
 'virat',
 'yuvi',
 'raina',
 'dhoni',
 'yousuf',
 'zaheer',
 'bumrah']
```

```
l[1:7]
```

```
['sehwag', 'gauti', 'virat', 'yuvi', 'raina', 'dhoni']
```

```
l[1:8:2]
```

```
['sehwag', 'virat', 'raina', 'yousuf']
```

```
l[1:7]
```

```
# adding elements to the list

csk = ["Hayden", "Vijay", "Raina"]
print(csk)
```

```
['Hayden', 'Vijay', 'Raina']
```

```
# add dhoni
print(csk)
csk.append("Dhoni")
print(csk)
```

```
['Hayden', 'Vijay', 'Raina']
['Hayden', 'Vijay', 'Raina', 'Dhoni']
```

```
print(csk)
csk.append("Jadeja")
print(csk)
```

```
['Hayden', 'Vijay', 'Raina', 'Dhoni']
['Hayden', 'Vijay', 'Raina', 'Dhoni', 'Jadeja']
```

```
l = [1,2,3,4]
print(l)
print(id(l))
l.append(5)
print(l)
print(id(l))
l.append("Venky")
print(l)
print(id(l))
```

```
[1, 2, 3, 4]
136061256532736
[1, 2, 3, 4, 5]
136061256532736
[1, 2, 3, 4, 5, 'Venky']
136061256532736
```

```
print(l)
```

```
[1, 2, 3, 4, 5, 'Venky']
```

```
l.append("rbr", "jay")
```

```
---------------------------------------------------------------------------
TypeError                                 Traceback (most recent call last)
<ipython-input-36-bd455326c484> in <cell line: 1>()
----> 1 l.append("rbr", "jay")

TypeError: list.append() takes exactly one argument (2 given)
```

Next steps: Explain error

```
l.append(["rbr", "jay"])
print(l)
```

```
[1, 2, 3, 4, 5, 'Venky', ['rbr', 'jay']]
```

```
a = [1,2,3]
a.append(('venky',"ev"))
print(a)
```

```
[1, 2, 3, ('venky', 'ev')]
```

```
l = l.append(["Hari", "Sriniwas"])
print(l)
```

```
None
```

```
numbers = [1,2,3,4,5]
print(numbers)
print(id(numbers))
k = numbers.append(6)
print(id(k))
print(k)
print(numbers)
print(id(numbers))
print(type(numbers))
numbers = numbers.append(7)
print(numbers)
print(id(numbers))
print(type(numbers))
```

```
[1, 2, 3, 4, 5]
136061254797696
97075373331424
None
[1, 2, 3, 4, 5, 6]
136061254797696
<class 'list'>
None
97075373331424
<class 'NoneType'>
```

```
l = [1,2,3]
l.append(4)
print(l)
```

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

```
l.append([5,6])
print(l)
```

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

```
indian_batting = ["Rohit", "Virat", "PANT","SKY"]

indian_batting.insert(1, "Jaiswal")
print(indian_batting)
```

```
['Rohit', 'Jaiswal', 'Virat', 'PANT', 'SKY']
```

```
indian_batting = ["Rohit", "Virat", "PANT","SKY"]

indian_batting[1] = "Jasiwal"
print(indian_batting)
```

```
['Rohit', 'Jasiwal', 'PANT', 'SKY']
```

```
indian_batting = ["Rohit", "Virat", "PANT","SKY"]

indian_batting.insert(1, "Jaiswal") # ro, ja, vi, pa, sky
indian_batting.insert(2, "Dhoni") # ro, ja, dhoni, vi, pa, sky
print(indian_batting)
```

```
['Rohit', 'Jaiswal', 'Dhoni', 'Virat', 'PANT', 'SKY']
```

```
indian_batting = ["Rohit", "Virat", "PANT","SKY"]

ind_bat = indian_batting.insert(1, "Jaiswal")
print(ind_bat)
print(indian_batting)
```

```
None
['Rohit', 'Jaiswal', 'Virat', 'PANT', 'SKY']
```

```
l = [1,2,3,4,5]
print(l)
print(id(l))
l.insert(2,10)
print(l)
print(id(l))
```

```
[1, 2, 3, 4, 5]
136061254798080
[1, 2, 10, 3, 4, 5]
136061254798080
```

```
l = [1,2,3]
l.insert(10, 'a')
print(l)
```

```
[1, 2, 3, 'a']
```

```
l = [1,2,3,4,5,6]
l.insert(2, "cab")
print(l)
```

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

```
l = [1,2,3,4,5,6]
l.insert(-2, 'abc')
print(l)
```

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

```
l = [1,2,3,4,5]
l.insert(2,'a')
print(l)
```

```
[1, 2, 'a', 3, 4, 5]
```

```
l = [1,2,3,4,5]
l.insert(-2,'a')
print(l)
```

```
[1, 2, 3, 'a', 4, 5]
```

```
l = [1,2,3,4,5]
l.insert(2, [10,20,30])
print(l)
```

```
[1, 2, [10, 20, 30], 3, 4, 5]
```

```
# extend

subjects = ["Linear Algebra", "Calculus", "Python", "DSA", "ML"]
print(subjects)
```

```
['Linear Algebra', 'Calculus', 'Python', 'DSA', 'ML']
```

```
new_subjects = ["Probability", "Statistics", "DBMS"]
subjects.append(new_subjects)
print(subjects)
```

```
['Linear Algebra', 'Calculus', 'Python', 'DSA', 'ML', ['Probability', 'Statistics', 'DBMS']]
```

```
# LA, C, P, DSA, ML, P, STS, DBMS

subjects = ["Linear Algebra", "Calculus", "Python", "DSA", "ML"]
print(subjects)
new_subjects = ["Probability", "Statistics", "DBMS"]
subjects.extend(new_subjects)
print(subjects)
```

```
['Linear Algebra', 'Calculus', 'Python', 'DSA', 'ML']
['Linear Algebra', 'Calculus', 'Python', 'DSA', 'ML', 'Probability', 'Statistics', 'DBMS']
```

```
alpha = ["a","b","c"]
alpha.append("def")
print(alpha)
alpha.extend("ghi")
print(alpha)
```

```
['a', 'b', 'c', 'def']
['a', 'b', 'c', 'def', 'g', 'h', 'i']
```

```
alpha = ["a","b","c"]
alpha.append("def")
print(alpha)
alpha.extend("ghi klm nop")
print(alpha)
```

```
['a', 'b', 'c', 'def']
['a', 'b', 'c', 'def', 'g', 'h', 'i', ' ', 'k', 'l', 'm',
```



```
a=[1,2,3]
b = [2,3,4]
c = a.extend(b)
print(a)
```

```
print(b)
print(c)
```

```
[1, 2, 3, 2, 3, 4]
[2, 3, 4]
None
```

```
alpha = ["a","b","c"]
alpha.append(10)
print(alpha)
alpha.extend((10,20,30))
print(alpha)
```

```
['a', 'b', 'c', 10]
['a', 'b', 'c', 10, 10, 20, 30]
```

```
alpha = ["a","b","c"]
alpha.append(10)
print(alpha)
alpha.extend({10,20,30})
print(alpha)
```

```
['a', 'b', 'c', 10]
['a', 'b', 'c', 10, 10, 20, 30]
```

```
s = {1,"a",2,"c"}
for element in s:
  print(element)
```

```
1
2
a
c
```

```
# user inputs for a list

input_user = input("Enter the input: ").split()
print(input_user)
print(len(input_user))
print(type(input_user))
```

```
Enter the input: 1 2 3 4
['1', '2', '3', '4']
4
<class 'list'>
```

```
n = int(input("Enter the size of the list : "))
new_list = []
for i in range(n):
  new_list.append(int(input("Enter the element")))
print(new_list)
```

```
Enter the size of the list : 5
Enter the element10
Enter the element20
Enter the element199
Enter the element200
Enter the element1
[10, 20, 199, 200, 1]
```

```
players = ["Rohit", "Jaiswal", "Virat", "Pant", "Sky", "Dube", "Hardik", "Jaddu"]
print(players)
players[5] = "Rinku"
print(players)
```

```
['Rohit', 'Jaiswal', 'Virat', 'Pant', 'Sky', 'Dube', 'Hardi
['Rohit', 'Jaiswal', 'Virat', 'Pant', 'Sky', 'Rinku', 'Hardik', 'Jaddu']
```

```
players = ["Rohit", "Jaiswal", "Virat", "Pant", "Sky", "Dube", "Hardik", "Jaddu"]
print(players)
players[5:] = "Rinku"
print(players)
```

```
['Rohit', 'Jaiswal', 'Virat', 'Pant', 'Sky', 'Dube', 'Hardik', 'Jaddu']
['Rohit', 'Jaiswal', 'Virat', 'Pant', 'Sky', 'R', 'i', 'n', 'k', 'u']
```

```
players = ["Rohit", "Jaiswal", "Virat", "Pant", "Sky", "Dube", "Hardik", "Jaddu"]
print(players)
players[5:] = ["Rinku"]
print(players)
```

```
['Rohit', 'Jaiswal', 'Virat', 'Pant', 'Sky', 'Dube', 'Hardik', 'Jaddu']
['Rohit', 'Jaiswal', 'Virat', 'Pant', 'Sky', 'Rinku']
```

```
players = ["Rohit", "Jaiswal", "Virat", "Pant", "Sky", "Dube", "Hardik", "Jaddu"]
print(players)
players[5:] = ["Rinku", "Tewatia", "Ashuthosh", "Shashank"]
print(players)
```

```
['Rohit', 'Jaiswal', 'Virat', 'Pant', 'Sky', 'Dube', 'Hardik', 'Jaddu']
['Rohit', 'Jaiswal', 'Virat', 'Pant', 'Sky', 'Rinku', 'Tewatia', 'Ashuthosh', 'Shashank']
```

```
players = ["Rohit", "Jaiswal", "Virat", "Pant", "Sky", "Dube", "Hardik", "Jaddu"]
print(players)
players[5:7] = ["Rinku", "Tewatia", "Ashuthosh", "Shashank"]
print(players)
```

```
['Rohit', 'Jaiswal', 'Virat', 'Pant', 'Sky', 'Dube', 'Hardik', 'Jaddu']
['Rohit', 'Jaiswal', 'Virat', 'Pant', 'Sky', 'Rinku', 'Tewatia', 'Ashuthosh', 'Shashank', 'Jaddu']
```

```
players = ["Rohit", "Jaiswal", "Virat", "Pant", "Sky", "Dube", "Hardik", "Jaddu"]
print(players)
print(players[5:2])
players[5:2] = ["Rinku", "Tewatia"]
print(players)
```

```
['Rohit', 'Jaiswal', 'Virat', 'Pant', 'Sky', 'Dube', 'Hardik', 'Jaddu']
[]
['Rohit', 'Jaiswal', 'Virat', 'Pant', 'Sky', 'Rinku', 'Tewatia', 'Dube', 'Hardik', 'Jaddu']
```

```
# remove, del, clear, pop

l = [1,2,3,4,5]
print(l)
l.remove(3)
print(l)
```

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

```
# remove, del, clear, pop

l = [1,2,3,4,5]
print(l)
l.remove(6)
print(l)
```

```
[1, 2, 3, 4, 5]
---------------------------------------------------------------------------
ValueError                                Traceback (most recent call last)
<ipython-input-84-81698a017bfb> in <cell line: 5>()
      3 l = [1,2,3,4,5]
      4 print(l)
----> 5 l.remove(6)
      6 print(l)

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

Next steps: Explain error

```
l = [1,2,3,6,4,3,5,3]
print(l)
l.remove(3)
print(l)
```

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

```
l = [1,2,3,6,4,3,5,3]
print(l)
a = l.remove(3)
print(a)
print(l)
```

```
[1, 2, 3, 6, 4, 3, 5, 3]
None
[1, 2, 6, 4, 3, 5, 3]
```

```
# remove, del, clear, pop

l = [1,2,3,4,5]
print(l)
del l[3]
print(l)
```

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

```
# remove, del, clear, pop

l = [1,2,3,4,5]
print(l)
del l[3:]
print(l)
```

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

```
# remove, del, clear, pop

l = [1,2,3,4,5]
print(l)
del l[1:4]
print(l)
```

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

```
# remove, del, clear, pop

l = [1,2,3,4,5]
print(l)
del l[:]
print(l)
```

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

```
# remove, del, clear, pop

l = [1,2,3,4,5]
print(l)
del l # delete the entire list
print(l)
```

```
[1, 2, 3, 4, 5]
---------------------------------------------------------------------------
NameError                                 Traceback (most recent call last)
<ipython-input-90-560515432711> in <cell line: 6>()
      4 print(l)
      5 del l
----> 6 print(l)

NameError: name 'l' is not defined
```

Next steps: Explain error

```
l = [1,2,3,4,5]
print(l)
l.clear()
print(l)
```

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

```
# remove, del, clear, pop

l = [1,2,3,4,5]
print(l)
a = l.pop()
print(l)
print(a)
```

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

```
# remove, del, clear, pop

l = [1,2,3,4,5]
print(l)
a = l.pop(3)
print(l)
print(a)
```

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

```
# remove, del, clear, pop

l = [1,2,3,4,5]
print(l)
a = l.pop(10)
```

```
print(l)
print(a)
```

```
[1, 2, 3, 4, 5]
---------------------------------------------------------------------------
IndexError                                Traceback (most recent call last)
<ipython-input-96-2ffe319d9767> in <cell line: 5>()
      3 l = [1,2,3,4,5]
      4 print(l)
----> 5 a = l.pop(10)
      6 print(l)
      7 print(a)

IndexError: pop index out of range
```

Next steps: Explain error

```
# list comprehensions

n = []

for i in range(1,101):
  n.append(i)

print(n)
```

```
[1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 3
```

```
l = [i for i in range(1,101)]
print(l)
```

```
[1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 3
```

```
l = [i*2 for i in range(1,5)]
print(l)
```

```
[2, 4, 6, 8]
```

```
n = []

for i in range(1,11):
  if i%2 == 0:
    n.append(i)
print(n)
```

```
[2, 4, 6, 8, 10]
```

```
l = [i for i in range(1,11) if i%2==0]
print(l)
```

```
[2, 4, 6, 8, 10]
```

```
# if even numbers add 5 to it
# else add 10 to it

[1,2,3,4,5,6]
[11,7,13,9,15,11]


l = [i+5 for i in range(1,7) if i%2==0 else i+10]

print(l)
```

```
  File "<ipython-input-104-daa23abd38aa>", line 1
    l = [i+5 for i in range(1,7) if i%2==0 else i+10]
                                               ^
SyntaxError: invalid syntax
```

Next steps: Fix error

```
l = [i+5 if i%2==0 else i+10 for i in range(1,10)]
print(l)
```

```
[11, 7, 13, 9, 15, 11, 17, 13, 19]
```

```
l = [1,2,3]
m = [2,3,4]
n = []
for i in l:
  for j in m:
    if i+j>3:
      n.append((i,j))

print(n)
```

```
[(1, 3), (1, 4), (2, 2), (2, 3), (2, 4), (3, 2), (3, 3), (3, 4)]
```

Start coding or generate with AI.