

#Lists in Python A list is a versatile data structure in Python that allows you to store an ordered collection of items. Lists can contain items of different types, such as integers, strings, or even other lists. Lists are mutable, meaning you can change their content without changing their identity.

Basic List Operations Creating a List: You can create a list by placing comma-separated values inside square brackets.

Accessing Elements: You can access elements of a list by indexing.

Modifying Elements: You can modify elements of a list by assigning new values to indices.

Adding Elements: You can add elements to a list using methods like `append()`, `extend()`, or `insert()`.

Removing Elements: You can remove elements from a list using methods like `remove()`, `pop()`, or `clear()`.

Slicing a List: You can extract parts of a list using slicing.

Iterating through a List: You can use loops to iterate through the elements of a list.

#Examples of list and why we need list

In [2]:

```
1 # List of student ages
2 student_ages = [18, 20, 19, 22, 21, 23, 20, 4444]
3 print(student_ages)
```

```
[18, 20, 19, 22, 21, 23, 20, 4444]
```

In [3]:

```
1 even_no=list([2,4,6,8,10])
2 print(even_no)
```

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

In [4]:

```
1 # List of account balances in dollars
2 account_balances = [1500.75, 2300.50, 1890.00, 750.25, 1200.60, 2100.80]
3 print(account_balances)
```

```
[1500.75, 2300.5, 1890.0, 750.25, 1200.6, 2100.8]
```

In [5]:

```
1 # List of country names
2 country_names = ["South Africa", "Nigeria", "Uganda", "Kenya", "Germany"]
3 print(country_names)
```

```
['South Africa', 'Nigeria', 'Uganda', 'Kenya', 'Germany', 'Brazil']
```

In [6]:

```
1 bank_account_details=["nilay",40,1878.6]
2 bank_account_details
```

Out[6]: ['nilay', 40, 1878.6]

##Accessing list elements /values using indexing

```
In [7]: 1 print(student_ages[0]) # Output: 18
        2 print(student_ages[2]) # Output: 22
        3
```

18
19

```
In [8]: 1 print(student_ages[-1]) # Output: 23
        2 print(student_ages[-2]) # Output: 21
```

4444
20

```
In [ ]: 1 print(account_balances[1]) # Output: 2000.50
        2 print(account_balances[3]) # Output: 2100.25
        3
```

2300.5
750.25

```
In [9]: 1 print(country_names[0]) # Output: "South Africa"
        2 print(country_names[4])
```

South Africa
Germany

```
In [ ]: 1 #win+shift+S
        2 #Task - create a list of city names from your country
        3 #Task - create a list of city area in square km
        4 #Task print first value from each list
```

#Modifying Elements

```
In [10]: 1 student_ages[0] = 19
        2 print(student_ages) # Output: [19, 20, 22, 19, 21]
        3
```

[19, 20, 19, 22, 21, 23, 20, 4444]

```
In [11]: 1 student_ages[-1] = 44
        2 print(student_ages) # Output: [19, 20, 22, 19, 21]
        3
```

[19, 20, 19, 22, 21, 23, 20, 44]

```
In [ ]: 1 #Task - modify values for account_balances and country_names
```

#Adding Elements

```
In [ ]: 1 student_ages.append(23)
        2 print(student_ages) # Output: [19, 20, 22, 19, 21, 23]
```

```
[19, 20, 19, 22, 21, 23, 20, 23]
```

```
In [13]: 1 #removing all the occurrences of 1 from the list
        2 lst=[1,2,3,1,6,7,1]
        3 for i in lst:
        4     if i==1:
        5         lst.remove(i)
        6 print(lst)
```

```
[2, 3, 6, 7]
```

```
In [ ]: 1 #Task - add a value for account_balances and country_ages
```

#Removing Elements

```
In [12]: 1 student_ages.remove(19)
        2 print(student_ages) # Output: [20, 22, 19, 21, 23]
        3
```

```
[20, 19, 22, 21, 23, 20, 44]
```

#Slicing a List

```
In [14]: 1 print(student_ages[1:4]) # Output: [20, 22, 19]
```

```
[19, 22, 21]
```

```
In [15]: 1 print(account_balances[:3]) # Output: [1500.75, 1800.00, 2100.25]
        2
```

```
[1500.75, 2300.5, 1890.0]
```

```
In [16]: 1 print(country_names[2:]) # Output: ["Mexico", "Spain", "Germany"]
```

```
['Uganda', 'Kenya', 'Germany', 'Brazil']
```

```
In [17]: 1 len(student_ages)
```

```
Out[17]: 7
```

```
In [ ]: 1 student_ages.sort()
        2 student_ages
```

```
Out[22]: [19, 20, 20, 21, 22, 23, 23]
```

```
In [ ]: 1 student_ages.sort(reverse=True)
        2 student_ages
```

Out[23]: [23, 23, 22, 21, 20, 20, 19]

```
In [18]: 1 #nested list
        2 lst=[[2,4,6],[1,3,5]]
        3 lst
```

Out[18]: [[2, 4, 6], [1, 3, 5]]

```
In [19]: 1 lst[0]
```

Out[19]: [2, 4, 6]

```
In [20]: 1 lst[0][1]
```

Out[20]: 4

```
In [21]: 1 l1=[10,20,30]
        2 l2=[40,50,60]
        3 l3=l1+l2
        4 l3
```

Out[21]: [10, 20, 30, 40, 50, 60]

```
In [ ]: 1
```