

Python Programming

List Data Structure

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Write a program that:

- reads 1000 integers and print them reversed!
- reads 1000 integers and find pairs of numbers with sum 12345?
- We can define 1000 variables! But this is a crazy idea!
- Python provides a **list** data structure that allows us to have be objects of many data types in a convenient way
 - Data structure: Something that has data and many useful methods over it
 - Later: You will study data structures course
- List: is an ordered sequence of items
 - They can be of different types!
 - It is a **mutable** class

Creating a list

```
2
3 my_list = [1, 2, 3, 4]
4
5 print(len(my_list)) ... # 4
6
7 print(2 in my_list) ... # True
8 print(9 in my_list) ... # False
9
10 for item in my_list: ... # 1 2 3 4
11     print(item, end=' ')
12 print()
13
14 print(my_list) ... # [1, 2, 3, 4]
15
16 # list of different data types!
17 my_list = [1, 'mostafa', 4.5]
18
19 # 🚨 IndexError: list assignment index out of range
20 # my_list[3] = 0
```

- We use brackets [] to create a list
- Between []: put your items, comma separated
- List is a sequence of items
 - It is **iterable**
 - We can use **in operator** to iterate
- A list can have different data types!

Indexing

```
1
2 numbers = [10, 2, 7, 5, 3]
3
4 numbers[0] = 9
5 numbers[2] *= 3
6 numbers[4] += 1
7
8 print(numbers[4])
9
10
11 for idx in range(5):
12     print(numbers[idx], end=' ')
13     # 9 2 21 5 4
```

- Line 2 creates a list

Index	0	1	2	3	4
numbers	10	2	7	5	3

- Line 4 changes first number to 9

Index	0	1	2	3	4
numbers	9	2	7	5	3

- Line 5 and 6 also do changes

Index	0	1	2	3	4
numbers	9	2	21	5	4

+ and * operators

```
1
2 my_list = [1, 'mostafa', 4]
3
4 another_list = [99, 11.5]
5
6 # 1 mostafa 4 99 11.5
7 conc_list = my_list + another_list
8
9 # 99 11.5 99 11.5
10 thrd_lst = 2 * another_list
11
12 lst = [0] * 6 # 0 0 0 0 0 0
13
14 lst += [2, 3] + [5]
15 # 0 0 0 0 0 0 2 3 5
16
```

“Acquire knowledge and impart it to the people.”

“Seek knowledge from the Cradle to the Grave.”