Python Lists & Arrays

By

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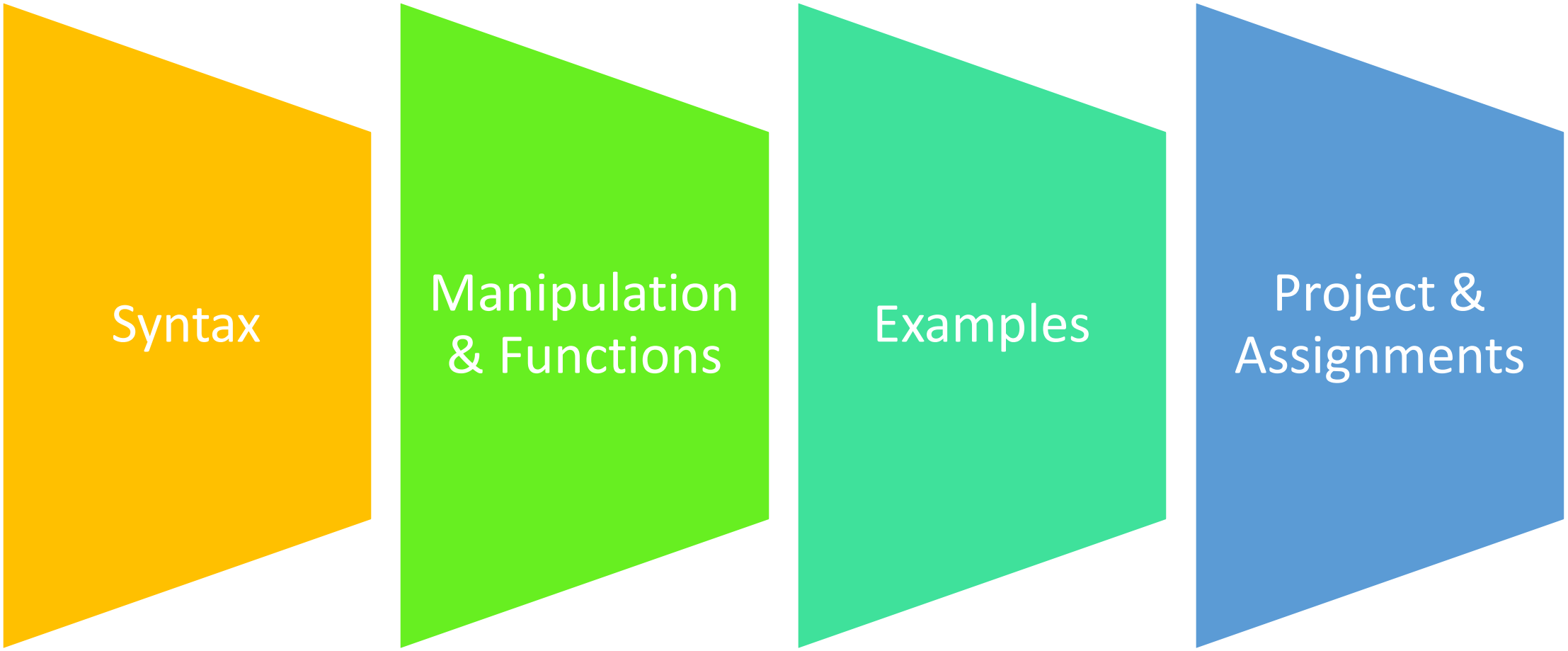
Lecture outline

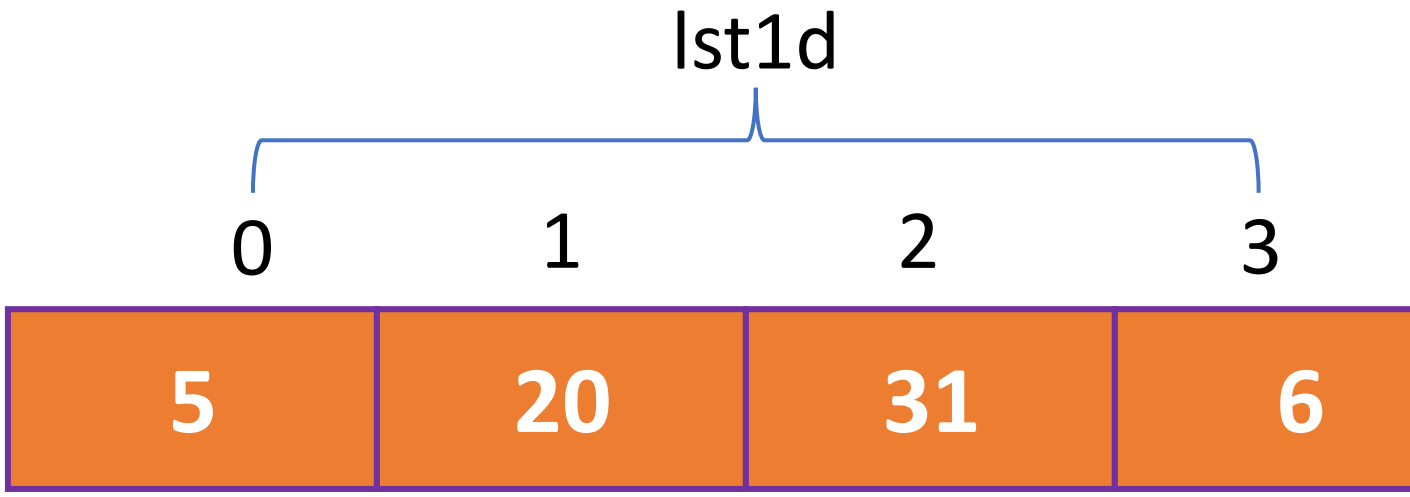


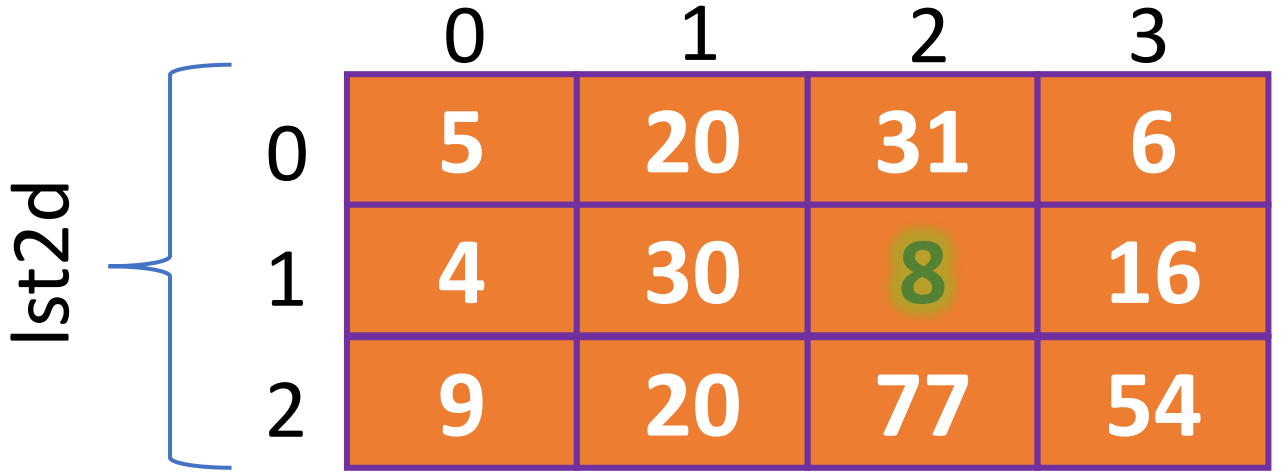
Syntax

- ists are one of 4 built-in data types in Python used to store collections of data, the other 3 are Tuple, Set, and Dictionary, all with different qualities and usage.
- Create a List:
  - Stdlist = [“Ahmed", “Amal", “Hani"]
  - print(Stdlist)
  - print(Stdlist[1])
  - thislist = ["apple", "banana", "cherry"]
    print(thislist[-1])
- Print the number of items in the list:
  - Stdlist = [“Ahmed", “Amal", “Hani"]
    print(len(Stdlist))

Dimensions

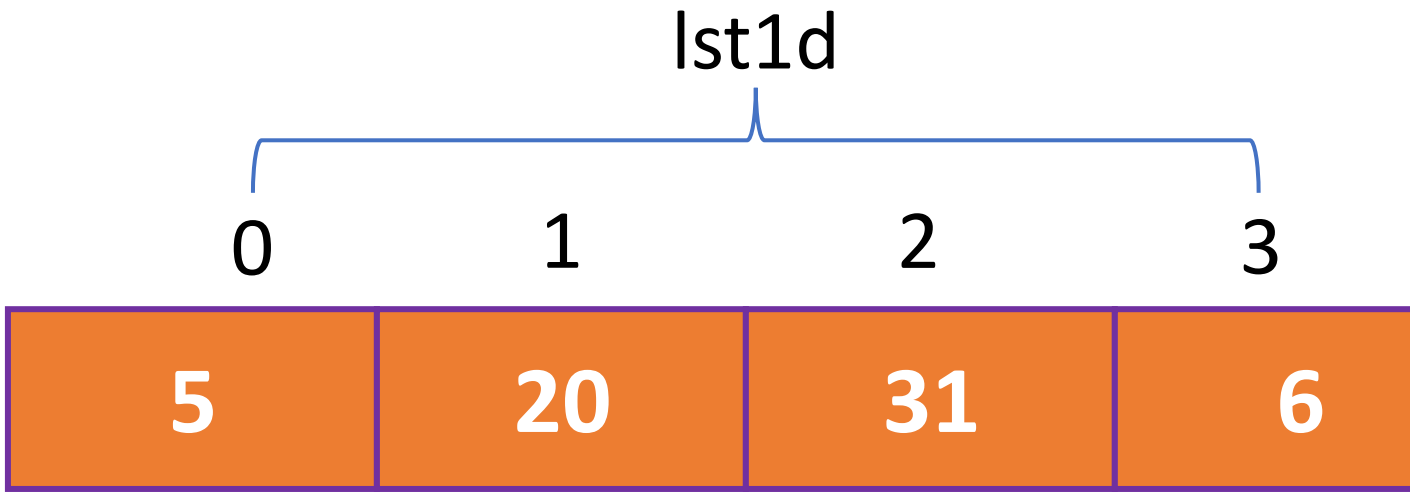
- 1-D
  - Indetified by a single index
  - Lst1d=[5, 20, 31, 6]
  - lst1d**[0]** = 5
- 2-D
  - Identified by two indices
  - lst2d= **?**
  - lst2d**[1] [2]** = 8

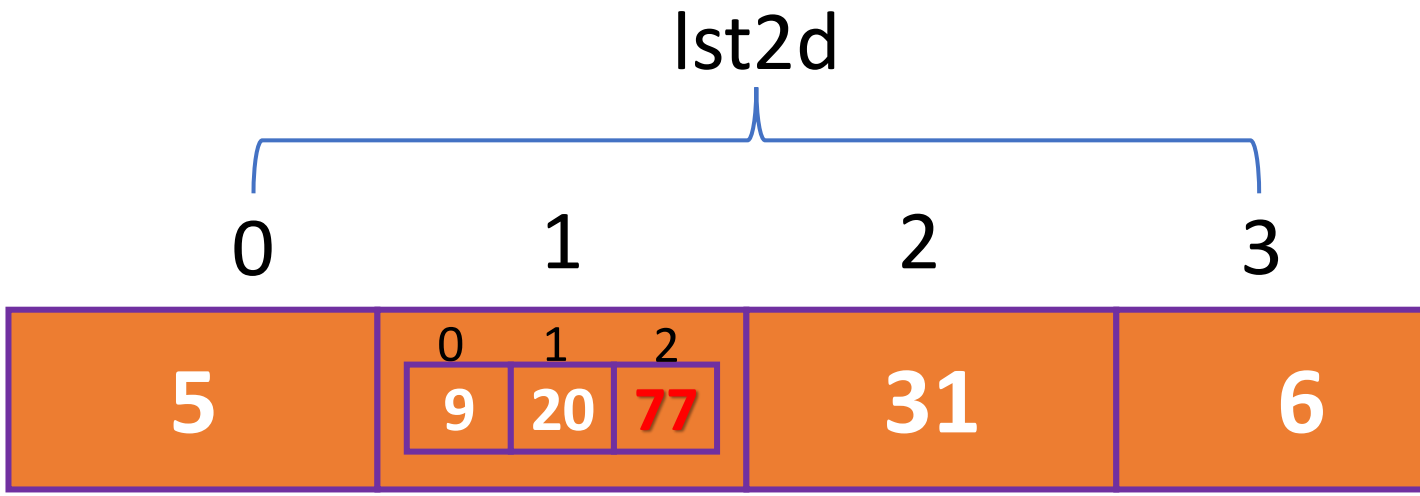




Dimensions

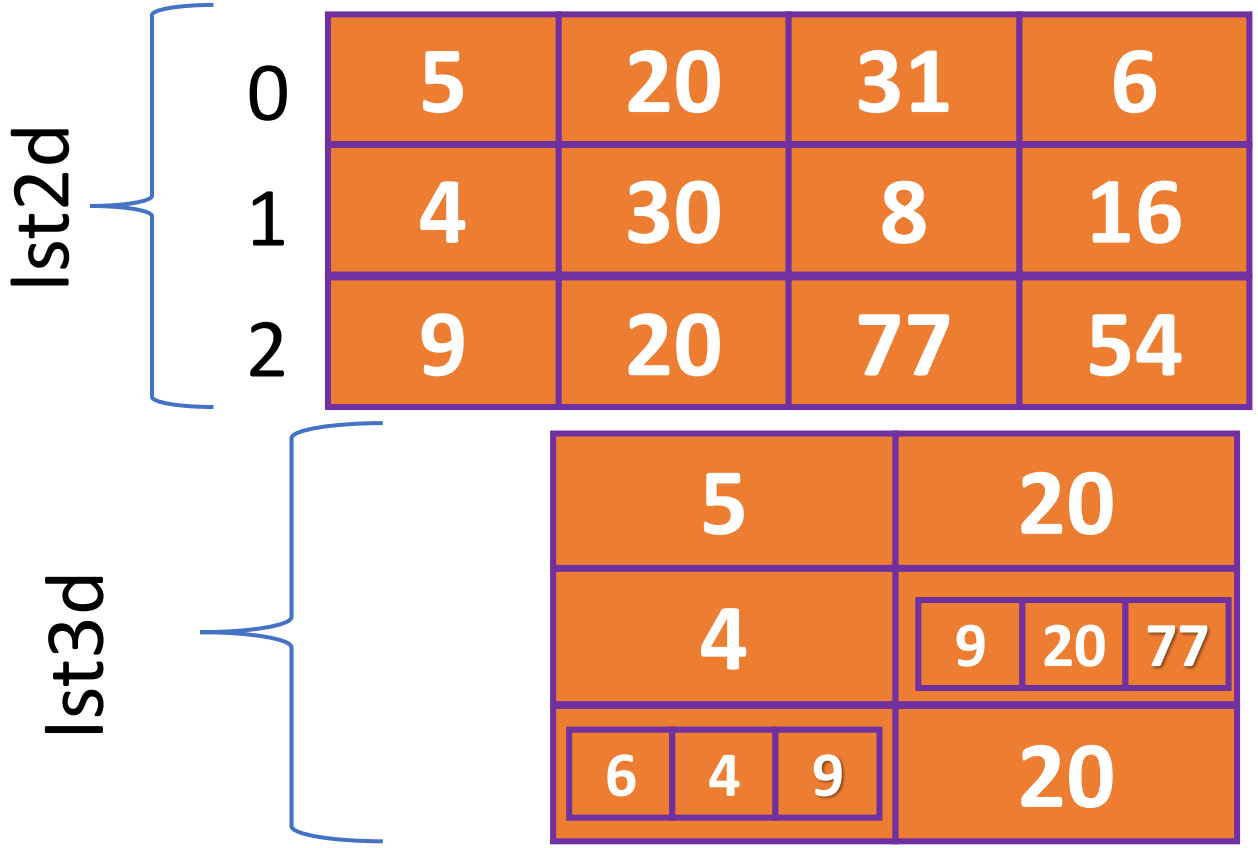
- 1-D
  - Indetified by a single index
  - Lst1d=[5, 20, 31, 6]
  - lst1d**[1]** = 20
- 2-D
  - Identified by two indices
  - lst2d**[1]** = ?
  - lst2d**[1][2] =77**
  - st2d = =[5, [9,20,77], 31, 6]





Dimensions

- Exercise : Define the list below in python



Practice Makes Perfect

Manipulation and functions

- **Range of Indexes**
- You can specify a range of indexes by specifying where to start and where to end the range.
- When specifying a range, the return value will be a new list with the specified items.
  - thislist = ["apple", "banana", "cherry", "orange", "kiwi", "melon", "mango"]
    print(thislist[2:5])
  - thislist = ["apple", "banana", "cherry", "orange", "kiwi", "melon", "mango"]
    print(thislist[:4])
  - thislist = ["apple", "banana", "cherry", "orange", "kiwi", "melon", "mango"]
    print(thislist[2:])

https://www.w3schools.com/python/python_lists_access.asp

Manipulation and functions

- **Check if Item Exists**
  - thislist = ["apple", "banana", "cherry"]
    if "apple" in thislist:
      print("Yes, 'apple' is in the fruits list")
- **Change a Range of Item Values**
  - thislist = ["apple", "banana", "cherry", "orange", "kiwi", "mango"]
    thislist[1:3] = ["blackcurrant", "watermelon"]
    print(thislist)

https://www.w3schools.com/python/python_lists_access.asp

Manipulation and functions

- **Insert Items**
  - thislist = ["apple", "banana", "cherry"]
    thislist.insert(2, "watermelon")
- **Append Items**
- To add an item to the end of the list, use the append() method:
  - thislist = ["apple", "banana", "cherry"]
    thislist.append("orange")

- **Remove Specified Item**
  - thislist = ["apple", "banana", "cherry"]
    thislist.remove("banana")
- **Delete The list**
  - thislist = ["apple", "banana", "cherry"]
    del thislist
- **Clear the List**
  - The list still remains, but it has no content
  - thislist.clear()

https://www.w3schools.com/python/python_lists_access.asp

Manipulation and functions

- **Loop Through a 2-D list**

```
grid = [[2, 6, 8, 6, 9], [2, 5, 5, 5, 0], [1, 3, 8, 8, 7], [3, 2, 0, 6, 9], [2, 1, 4,5,8], [5, 6, 7, 4, 7]]
for row in grid:
        for item in row:
                print(item, end = " ")
        print()
```

```
li=[[1,2,3,4],[5,6,7],[8,9]]
for i in range(len(li)):
    for j in range(len(li[i])):
        print(li[i][j],end = " ")
   print()
```

Manipulation and functions

- **Loop Through a List**
  - thislist = ["apple", "banana", "cherry"]
    for x in thislist:
      print(x)
- **Loop Through the Index Numbers**
  - thislist = ["apple", "banana", "cherry"]
    for i in range(len(thislist)):
      print(thislist[i])

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Practice Makes Perfect

Examples and excercises

- **Sum list items**
- **Split list into odd and even lists**
- **Add two matrices**
- **Insert, delete items into 2-D list**

Project & assignments

- Supermarket invoicing using multiple 1-D lists
- Super market invoiving using single 2-D array
- Create excel file contains student data and read into a list
- From your understanding and external reading, write 1 page report describing the differences between lists, tuples, sets, and dictionaries in python, and application.

Thank U

- Discussion