Python Applications using: Lists

Chapter 3 (Textbook)

www.w3schools.com

Lists

www.w3schools.com

Examples are taken from www.w3schools.com

List – contents covered

- Representation of list
- Displaying list elements
- Displaying range of list elements
- Replacing list elements
- Traversing list elements
- Adding list elements
- Removing list elements
- Copying list
- Appending lists

List - representation

- List is collection of ordered elements that may be duplicated list elements or these are also changeable list elements
- Example:

```
thislist = ["apple", "banana", "cherry"]
print(thislist)
```

Each element of list is a String
Element of List is represented by an INDEX – This statement displays “banana”

```
#List ELEMENTS are accessible using INDEX value
#INDEX value starts at INDEX 0
thislist = ["apple", "banana", "cherry"]
print(thislist[1])
```

```
## Last ELEMENT is referred by INDEX value -1
thislist = ["apple", "banana", "cherry"]
print(thislist[-1])
```

Last ELEMENT of List has an INDEX value -1
This statement displays “cherry”

List – display range of elements from List

```
## Range of elements in LIST can be printed -
# It prints element 2, 3 and 4 (NOT element 5 in 2:5 range)

thislist = ["apple", "banana", "cherry", "orange", "kiwi", "melon", "mango"]
print(thislist[2:5])
```

Displays “cherry”, “orange”, “kiwi”
These are at INDEX values 2, 3 and 4

```
#### Displays from beginning to index 3 (NOT index 4)
thislist = ["apple", "banana", "cherry", "orange", "kiwi", "melon", "mango"]
print(thislist[:4])
```

```
## Displays the list of elements starting from element at INDEX value 2 ("cherry")
## and goes to display all the way to the last element in the list ("mango")
thislist = ["apple", "banana", "cherry", "orange", "kiwi", "melon", "mango"]
print(thislist[2:])
```

List – replace element at a specific index value

```
## Change value at INDEX 1
## So "banana" is replaced with "blackcurrant"

thislist = ["apple", "banana", "cherry"]
thislist[1] = "blackcurrant"
print(thislist)
```

List – traverse and display list elements

```
### Displays each element of the List as a String
thislist = ["apple", "banana", "cherry"]
for x in thislist:
  print(x)
```

```
#### Checks if an ELEMENT has a given value in LIST
fruit = "Pineapple"
thislist = ["apple", "banana", "cherry"]
if fruit in thislist:
  print("Yes, 'apple' is in the fruits list")
else:
    print(fruit + " is NOT in the List of fruits")
```

Check the element of list – if specific element is in list or not?

List – Add Element into List

```
### Appends ELEMENT to the end of the LIST

thislist = ["apple", "banana", "cherry"]
print(thislist)
thislist.append("orange") #### "oragne" is added to the end of the List
print(thislist)

#########################
```

Use append to add at the end of the List

```
######### Insert an ELEMENT in the list at a GIVEN index value

thislist = ["apple", "banana", "cherry"]
thislist.insert(1, "orange")  #### "orange" is added (at INDEX 1) after "apple" and "banana"
#### is now at INDEX value 2
print(thislist)

#### ####################    ###############
```

Use ‘insert’ to insert an element at a specific INDEX of the List

List – Remove an Element from the List

```
#### Removes an ELEMENT from the List

thislist = ["apple", "banana", "cherry"]
thislist.remove("banana") ### "banana" is removed and only two
## elements are left
print(thislist)

############################################################


#### Removes an ELEMENT from the List - one that appears first
#### is removed from the LIST

thislist = ["apple", "banana", "cherry", "banana"]
thislist.remove("banana") ### "banana" is removed and only three
## elements are left - "banana" at INDEX -1 is NOT removed
print(thislist)

############################################################
```

Method ‘remove’, removes an element that appears at the first location in the List

List – Remove element from List using ‘pop’

```
########################################
###### pop removes last element from the LIST

thislist = ["apple", "banana", "cherry"]
print(thislist)
thislist.pop()
print(thislist)

#####################################


##############

###### pop removes element at given index value from the LIST

thislist = ["apple", "banana", "cherry", "blackberry", "pineapple", "orange"]
print(thislist)
thislist.pop(3)
print(thislist)

#####################################
```

list.pop() – removes last element from list

List – Use ‘del’ to delete list element or complete list

```
#####################################################
#### Delete element at given INDEX value

thislist = ["apple", "banana", "cherry"]
del thislist[0] ### "apple" is removed from the list and "banana"
#### is now at INDEX 0
print(thislist)

#####################################################

######### DELETE the entire LIST ##################

thislist = ["apple", "banana", "cherry"]
del thislist

#####################################################
```

List – create an identical list (by assignment)

```
##### Assigns a list to another List ####

thislist = ["apple", "banana", "cherry"]
print(thislist)
mylist = thislist
print(mylist)

### Append element to thislist
thislist.append("pineapple")
print(thislist)

### Now print mylist - which is copy of thislist
print(mylist)

##### Both thislist and mylist are same LISTS
```

List – append two lists together or add a list at the end of other list

```
####### append one list with other list #####

list1 = ["a", "b" , "c"]
list2 = [1, 2, 3]

list3 = list1 + list2
print(list3)

##############################################
```

```
############# Appending a List to another List #######

list1 = ["a", "b" , "c"]
list2 = [1, 2, 3]

for x in list2:
  list1.append(x)

print(list1)

##############################################################
```

List – append a list using ‘extend’ method

```
###### EXTEND one list by ADDING the other list at the end ########

list1 = ["a", "b" , "c"]
list2 = [1, 2, 3]

list1.extend(list2)
print(list1)



########################################################################
```

Processing List

```
def main():
    numbers=[3,7,8,9]
    square_value=[]
    for index_value in range (len(numbers)):
        square_value.append (numbers[index_value] ** 2)
    for value in square_value:
        print(value)
if __name__=='__main__':
    main()

##########################################################################################
```

If Element is part of List – True or False

```
def main():
    numbers=[3,7,8,9]
    target=8
    if target in numbers:
        print('The value of target (value is {}) at the index {}.'.format(target,numbers.index(target)))

if __name__=='__main__':
    main()

##########################################################################################
```

Converting List element to upper case

```
def main():
    sentence = "This example has five words."
    words=sentence.split()
    for index_value in range (len(words)):
        words[index_value] = words[index_value].upper()
    print(sentence)
    print(words)
if __name__=='__main__':
    main()
##########################################################################################
```

List – Example used for Network Automation

```
router_info=" interface:Eth1, IPADDRESS:192.168.10.10, MASK:255.255.255.0, STATUS:no shutdown"
print (router_info)  # This prints the complete string
print(type(router_info)) # This displays that type is string
info_split1=router_info.split(',') #When string is split, it creates a list of elements
print(type(info_split1)) ##when string splits then List of number of elements is created

#NOW display Each Element of the List
for data in info_split1:
    print(data) #  Print each Element of the LIST - Each Element of List is STRING
    print(type(data)) # Each Element of List is of the type STRING
    ## For each element, further split based on :
    info_sub_detail = data.split(':') #  When string splits - it creates List of number of elements
    ### Each element of List is string so
    ##  info_sub_detail[0] is a string
    ##  info_sub_detail[1] is a string
    print(type(info_sub_detail[0]))
    print(type(info_sub_detail[1]))

    print(info_sub_detail[0], info_sub_detail[1])
```

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