



Unit 5: Recursion & Lists

Activity 3: Operating on Lists

In this lesson, you will learn how to edit **lists** in programs, including how to add, delete, and rearrange elements in a list.

Objectives:

- Perform operations on lists and their elements
- Use operations to analyze lists and their elements

Entering Values into a List Using Input

1. First, define a new list using the assignment operator and an empty list (using square brackets).
2. Use a loop to enter values into the list using **input** and **.append**.

Note the use of string concatenation (+) and string conversion (str()) to build the prompt.

```
lists.py
mylist=[]
for i in range(5):
    x=int(input("Enter value for element "+str(i+1)+" : "))
    mylist.append(x)
```

3. Store and run the program. When the program is done, display the entered list in the Python shell to confirm the changes.

```
Python Shell 10/10
>>>#Running lists.py
>>>from lists import *
Enter value for element 1: 9
Enter value for element 2: 11
Enter value for element 3: 13
Enter value for element 4: 15
Enter value for element 5: 17
>>>mylist
[9, 11, 13, 15, 17]
>>>
```

Combining Two Lists

Method 1: Using +

1. Two lists can be combined using the operator **+**. For example, if **list1 = [1,2,3]** and **list2 = [4,5,6,7]**, the code **mylist=list1+list2** will combine **list1** and **list2** into a new list called **mylist**.

What would **mylist** be if it was defined as **mylist=list2+list1**?

```
lists.py 4/5
list1=[1,2,3]
list2=[4,5,6,7]
mylist=list1+list2
print(mylist)
```

Method 2: Using .append and a loop

2. Two lists can be combined using the **.append** command and a **for** loop. The **.append** command can only add one element to the end of a list; however, this process could be looped through to add all of the elements from the second list to the end of the first list.

How does the code **range(len(list2))** work in this program?

How does the code **list1.append(list2[i])** work in this program?


```
*lists.py 7/8
list1=[1,2,3]
list2=[4,5,6,7]

for i in range(len(list2)):
    list1.append(list2[i])

print(list1)
```

Removing Elements from a List

1. You can use the **del** function to remove an element based on its index (or position in the list). **del mylist[3]** deletes the element currently at position 3 (the fourth element) in the list. This command will decrease the length of the list by one.



```
lists.py 3/4
mylist=[11,13,15,17,19]
del mylist[3]
print(mylist)
```

Your Turn

Write a program to *reverse* the elements in **mylist**. That is, if **mylist** contains [1, 4, 3, 2], then after running your program it will contain [2, 3, 4, 1].

Can you do it using only **mylist** and no other list?

Make sure it works for *any* (non-empty) size list, too!