VIDEO 11 : LISTS

In this video we'll look at numerous list functions, how to sort lists with the Bubble Sort and much more.

With lists we can refer to groups of data with 1 name. Each item in the list corresponds to a number (index) just like how people have identification numbers. By default the 1st item in a list has the index 0.

Ex. [0 : "string"] [1 : 1.234] [2 : 28] [3 : "c"]

Python lists can grow in size and can contain data of any type. An awesome thing about lists is that you can use many of the same functions with them that you used with strings.

CODE

```
rand_list = ["string", 1.234, 28]

# Create a list with range
one_to_ten = list(range(10))

# Combine lists
rand_list = rand_list + one_to_ten

# Get the 1st item with an index
print(rand_list[0])

# Get the length
print("List Length :", len(rand_list))

# Slice a list to get 1st 3 items
first3 = rand_list[0:3]

# Cycle through the list and print the index
for i in first3:
    print("{} : {}".format(first3.index(i), i))

# You can repeat a list item with *
print(first3[0] * 3)

# You can see if a list contains an item
print("string" in first3)

# You can get the index of a matching item
print("Index of string :", first3.index("string"))

# Find out how many times an item is in the list
print("How many strings :", first3.count("string"))

# You can change a list item
first3[0] = "New String"

for i in first3:
```

```
    print("{} : {}".format(first3.index(i), i))

# Append a value to the end of a list
first3.append("Another")
```

Python Problem for you to Solve

For this problem generate a random list of 5 values between 1 and 9

Solution

CODE

```
Import random
num_list = []
for i in range(5):
    num_list.append(random.randrange(1, 9))
```

Bubble Sort

The Bubble sort is a way to sort a list. It works this way :

1. An outer loop decreases in size each time
2. The goal is to have the largest number at the end of the list when the outer loop completes 1 cycle
3. The inner loop starts comparing indexes at the beginning of the loop
4. Check if list[Index] > list[Index + 1]
5. If so swap the index values
6. When the inner loop completes the largest number is at the end of the list
7. Decrement the outer loop by 1

Here is a bubble sort in code

CODE

```
# Create the value that will decrement for the outer loop
# Its value is the last index in the list
i = len(num_list) - 1

while i > 1:

    j = 0

    while j < i:

        # Tracks the comparison of index values
        print("\nIs {} > {}".format(num_list[j], num_list[j+1]))
        print()

        # If the value on the left is bigger switch values
        if num_list[j] > num_list[j+1]:

            print("Switch")
```

```
            temp = num_list[j]
            num_list[j] = num_list[j + 1]
            num_list[j + 1] = temp

        else:
            print("Don't Switch")

        j += 1

        # Track changes to the list
        for k in num_list:
            print(k, end=", ")
        print()

    print("END OF ROUND")

    i -= 1

for k in num_list:
    print(k, end=", ")
print()
```

More List Functions

CODE

```
Import random
num_list = []
for i in range(5):
    num_list.append(random.randrange(1, 9))

# Sort a list
num_list.sort()

# Reverse a list
num_list.reverse()

for k in num_list:
    print(k, end=", ")
print()

# Insert value at index insert(index, value)
num_list.insert(5, 10)

# Delete first occurrence of value
num_list.remove(10)

for k in num_list:
    print(k, end=", ")
print()

# Remove item at index
```

```
num_list.pop(2)

for k in num_list:
    print(k, end=", ")
print()
```

That’s all for this video. In the next video I’ll cover List Comprehensions, Multidimensional Lists and you’ll have to solve another problem.