Python Collections (Arrays)

There are four collection data types in the Python programming language:

- List is a collection which is ordered and changeable. Allows duplicate members.
- Tuple is a collection which is ordered and unchangeable. Allows duplicate members.
- Set is a collection which is unordered, unchangeable*, and unindexed. No duplicate members.
- Dictionary is a collection which is ordered** and changeable. No duplicate members

List

Lists are used to store multiple items in a single variable.
Lists are created using square brackets:

In [3]:

```
artificial_Intelligence=['Machine learning', 'Deep learning','Natural Language Processing','Computer Vision']
print(artificial_Intelligence)
```

```
['Machine learning', 'Deep learning', 'Natural Language Processing', 'Computer Vision']
```

In [5]:

```
list1 = [1, 5, 7, 9, 3]
list2 = [True, False, False]
print(list1)
print(list2)
```

```
[1, 5, 7, 9, 3]
[True, False, False]
```

In [9]:

```
# List lenght
len(list1),len(list2),len(artificial_Intelligence)
```

Out[9]:

```
(5, 3, 4)
```

Access Items

List items are indexed and you can access them by referring to the index number:

In [10]:

```
print(artificial_Intelligence[0])
```

```
Machine learning
```

In [11]:

```
#Negative Indexing
'''Negative indexing means start from the end

-1 refers to the last item, -2 refers to the second last item etc.'''
print(artificial_Intelligence[-1])
```

```
Computer Vision
```

Range of Indexes

In [12]:

```
print(artificial_Intelligence[0:])
```

```
['Machine learning', 'Deep learning', 'Natural Language Processing', 'Computer Vision']
```

In [13]:

```
print(artificial_Intelligence[1:-1])
```

```
['Deep learning', 'Natural Language Processing']
```

In [15]:

```
print(artificial_Intelligence[:3])
```

```
['Machine learning', 'Deep learning', 'Natural Language Processing']
```

In [16]:

```
print(artificial_Intelligence[-4:-1])
```

```
['Machine learning', 'Deep learning', 'Natural Language Processing']
```

In [17]:

```
print(artificial_Intelligence[-4:])
```

```
['Machine learning', 'Deep learning', 'Natural Language Processing', 'Computer Vision']
```

In [18]:

```
print(artificial_Intelligence[0:len(artificial_Intelligence)])
```

```
['Machine learning', 'Deep learning', 'Natural Language Processing', 'Computer Vision']
```

Changeable

The list is changeable, meaning that we can change, add, and remove items in a list after it has been created.

In [27]:

```
#To change the value of a specific item, refer to the index number:
artificial_Intelligence[0]='ML'
print(artificial_Intelligence)
```

```
['ML', 'DL', 'NLP', 'CV']
```

In [28]:

```
#change the value of list index
artificial_Intelligence[-1]='CV'
print(artificial_Intelligence)
```

```
['ML', 'DL', 'NLP', 'CV']
```

In [29]:

```
#Change a Range of Item Values
artificial_Intelligence[1:-1]=['DL','NLP']
print(artificial_Intelligence)
```

```
['ML', 'DL', 'NLP', 'CV']
```

Insert Items

To insert a new list item, without replacing any of the existing values, we can use the insert() method.

In [31]:

```
artificial_Intelligence.insert(0,'Data science')
print(artificial_Intelligence)
```

```
['Data science', 'Machine learning', 'ML', 'DL', 'NLP', 'CV']
```

In [33]:

```
# To add an item to the end of the list, use the append() method:
artificial_Intelligence.append('Neural Networks')
print(artificial_Intelligence)
```

```
['Data science', 'Machine learning', 'ML', 'DL', 'NLP', 'CV', 'Neural Networks']
```

In [35]:

```
# Extend List
AI=['Robotics','Expert Systems','Speech Processing']
artificial_Intelligence.extend(AI)
print(artificial_Intelligence)
```

```
['Data science', 'Machine learning', 'ML', 'DL', 'NLP', 'CV', 'Neural Networks', 'Robotics', 'Expert
Systems', 'Speech Processing', 'Robotics', 'Expert Systems', 'Speech Processing']
```

Remove List Items

In [42]:

```
#The remove() method removes the specified item.
artificial_Intelligence.remove('Machine learning')
artificial_Intelligence
```

In [43]:

```
#The pop() method removes the specified index.
artificial_Intelligence.pop(0)
artificial_Intelligence
```

Out[43]:

```
['DL',
 'NLP',
 'CV',
 'Neural Networks',
 'Robotics',
 'Expert Systems',
 'Speech Processing',
 'Robotics',
 'Expert Systems',
 'Speech Processing']
```

In [45]:

```
# if you want to delete the specfic list use del keyword
AI=['Robotics','Expert Systems','Speech Processing']
del AI
# print(AI)
```

In [47]:

```
#The clear() method empties the list.
AI=['Robotics','Expert Systems','Speech Processing']
AI.clear
print(AI)
```

```
['Robotics', 'Expert Systems', 'Speech Processing']
```

Sort Lists

List objects have a sort() method that will sort the list alphanumerically, ascending, by default:

In [3]:

```
#Sort the list alphabetically:
thislist = ["orange", "mango", "kiwi", "pineapple", "banana"]
thislist.sort()
print(thislist)
```

```
['banana', 'kiwi', 'mango', 'orange', 'pineapple']
```

In [4]:

```
#Sort the list numerically:
thislist = [100, 50, 65, 82, 23]
thislist.sort()
print(thislist)
```

```
[23, 50, 65, 82, 100]
```

In [5]:

```
# Sort the list descending:
thislist = [100, 50, 65, 82, 23]
thislist.sort(reverse = True)
print(thislist)
```

```
[100, 82, 65, 50, 23]
```

In [6]:

```
#Copy a List
"""'You cannot copy a list simply by typing list2 = list1,
because: list2 will only be a reference to list1, and changes made in list1 will automatically also be made in li
st2.'"""
copy_List=thislist.copy()
print(copy_List)
```

```
[100, 82, 65, 50, 23]
```

In [ ]:

```

```