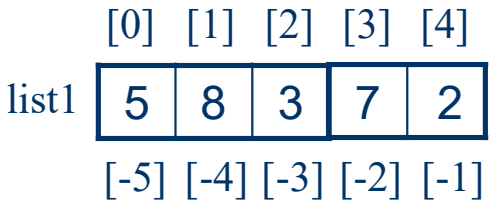
Python collections (arrays)

- Single variables are not adequate to store large volumes of information
- Collections allow storage and access of large volumes of information
- Python has the following collection data types:
  - **List** (ordered, indexed, changeable, allows duplicates)
  - **Tuple** (ordered, indexed, unchangeable, allows duplicates)
  - **Set** (unordered, unindexed, no duplicates)
  - **Dictionary** (unordered, indexed, changeable, no duplicates)

Lists

- A List is an ordered collection of changeable items that can be of different types

```
list1 = [1, 8, 3, 7, 2]
list1[0] = list1[1] – list1[2]
```



- The elements of a List can be accessed from left to right or from right to left using a for loop

```
for i in range(0,5):
    print(list1[i])
```

```
for value in list1 :
    print(value)
```

```
for i in range(-1,-6,-1):
    print(list1[i])
```

- A sub-list of elements can be obtained by specifying a range of indexes (slice)

```
list1[start:end:step]
```

```
list1[:3]      list1[2:]      list1[-3:-1]      list1[0:5:2]
[5,8,3]        [3,7,2]        [3,7]             [5,3,2]
```

- Check if an element exists in a List

```
if 8 in list1:
    print("8 is in the list“)
```

- Remove one or more elements from a List

```
del list1[0]      del list1[1:3]      del list1[:]      del list1
```

Lists

- Number of elements in the List — `len(list1)`
- Join two Lists — `list3 = list1 + list2`
- Creating a new List (constructor) — `newlist = list(("antonio", "luisa", "carlos"))`
- List built-in methods:

list.append(value)	Appends an element to the list
list.extend(list)	Add the elements of a list to the current list
list.insert(position, value)	Inserts an element at the specified position
list.remove(value)	Removes the value from the list
list.pop(position)	Removes the element at the specified position or the last one - pop()
list.clear()	Clears all the elements from the list
list.index(value)	Returns the index of the first element with the specified value
list.count(value)	Returns the number of elements with the specified value
list.sort()	Sorts the list
list.reverse()	Reverses the order of the list
list.copy()	Returns a copy of the list