1. Lists are a compound data type. they can contain different data types, and
their size can change.

```
>>> ls = [34.5, 0, True, 'str']
>>> numbers = [1, 3, 4, 6]
>>> numbers
[1, 3, 4, 6]
```
----
2. lists can be indexed and sliced (list indexing takes constant time)

```
>>> numbers[0] # indexing returns the item
1
>>> numbers[-1]
6
>>> numbers[2:] # slicing returns a new list
[4, 6]
```
----
3. lists support + operator as concatenation

```
>>> numbers + [8, 10]
[1, 3, 4, 6, 8, 10]
```
----
4. unlike strings, lists are mutable

```
>>> numbers[0] = 100
>>> numbers
[100, 3, 4, 6]
```
----
5. new lists can be assigned to slices

```
>>> letters = ['a', 'b', 'c', 'd', 'e', 'f']
>>> letters
['a', 'b', 'c', 'd', 'e', 'f']
>>> letters[1:3] = ['x', 'y'] # replace some values
>>> letters
['a', 'x', 'y', 'd', 'e', 'f']
>>> letters[1:3] = [] # remove some values
>>> letters
['a', 'd', 'e', 'f']
>>> letters[:] = [] # remove all the elements in the array
>>> letters
[]
```
----
6. built-in function len() returns the number of elements in the list

```
>>> numbers = [1, 2, 4]
>>> len(numbers)
3
```
----
7. you can nest lists to create matrices

```
>>> matrix = [[1, 2, 3], [4, 5, 6], [7, 8, 9]]
```

```
>>> matrix[0][0]
1
>>> matrix[1][2]
6
```