Lists

```python
# ###########################      Class 6    #########################
# # # compare list with array in c. we have to use for loop to print array each
array elements.
# # # imperative & declarative
# # #
# # # letters = [10, 20, 30, 40]
# # #     index:  0   1   2   3
# # #     length: 1   2   3    4
# # #
# # # list maximum size?
#
numbers = [100,67,89,50]
print(len(numbers))
print("length: " + str(len(numbers)))
print("Hello" + 'World')
print('length: ' + str(len(numbers)))
# use of f string
print(f"Address: {id(numbers)}")
print(f"Address: {id(numbers[0])}")
print(f"Address: {id(numbers[1])}")
print(f"Address: {id(numbers[2])}")
print(f"Address: {id(numbers[3])}")


numbers = [100,67,89,50]
print(numbers)
names = ['Arun', 'Mary', 'Dora']
print(names)
names[0] = "Peter"
print(names)
#
# #Lists are mutable
# # we can change values. we can append() and insert() values
# # append(value) adds at the end of the list &
# # insert(index,value) adds in a specific place.
#
# # to add a single values to list
names.append("John")
print(names)
names.append(-1)  # u can append numbers(diff data type)
print(names)
#
# # List can hold different datatype values
values = [23, 'Arun', 67.6, 'Mary', 89, 95.6]
print(values)
```

```python
#
# # Joining two list using + operator
join_list = numbers + names
print(f"join list: {join_list}")
join_list1 = names + numbers
print(f"join list1 {join_list1}")
#
# # Joining two lists using extend()
favorite_numbers = [100, 200, 300, 400]
names = ["selvi","vivek",'lilian']
favorite_numbers.extend(names)
print(f"extend favorite numbers list: {favorite_numbers}")
names.extend(favorite_numbers)
print(f"extend names list : {names}")
#
# # To insert values in the list - index, value
shapes = ['circle',"triangle",'line',"dot"]
shapes.insert(3,'Octagon')
print(shapes)


shapes = ['circle, triangle, line, dot','posiy']
print(shapes)
print(shapes[0])
print(shapes[1])
#
# # remove(item) - remove the item from the list
# # pop(index)
shapes = ['circle','triangle','line','dot']
shapes.remove('line')
shapes.remove('circle')
print(shapes)
#

shapes.append('Octagon')
shapes.append('Oval')
print(shapes)
# #
shapes.pop()
shapes.pop()
print(shapes)
shapes.append('zigzag')
print(shapes)
shapes.pop(1)
print(shapes)
shapes.clear()
print(shapes)
```

```python
#
shapes = ['circle',"triangle",'line',"dot"]
print(shapes.index("line")) #usecases: student rollno
print(shapes.index("tilde"))
#
# shapes = ['circle',"triangle",'line',"dot",'line']
# print(shapes.count("line"))  #usecases: person same name, help to find
# # # duplicate values
# #
shapes.sort()
print(shapes)
shapes.reverse()
print(shapes)
#
fruits = ['strawberry','orange','grapes','apple']
fruits2 = fruits.copy() # extra printouts
#students moves from 2nd to 3rd standard(same details:name,address
# + extra students
print(fruits2)
del fruits[0]
del fruits[4]
print(fruits)
#
#
#
#
# # compare all the list, string functions with c, c++
#
# #
# # #del()
```

Multi Dimensional List

```python
list_2D = [
    [11,12,13,14,15],
    [21,22,23,24],
    [31,32,33],
    [41,42],
    [51]
]

print(list_2D[0][0])
print(list_2D[2][2])
print(list_2D[4][0])
print(list_2D[4][1])
```

Tuples

```python
coordinates = (4.5,7.5)
print(coordinates)
print(coordinates[0])
print(coordinates[1])

#coordinates[0] = 10.5



#coordinates[1] = 10.5
# tuples are immutable
# map coordinates x,y values and
# machine fridge, aeroplane etc measurement
# design are good example for tuple

# tuples inside list
coordinates = [(2,3),(67,89),(101.3,505.7)]
print(coordinates)
print(coordinates[1])
```