Lists

- Can be of any length
- Can have more than one datatype
- Can allow duplicates

In [4]:
```
#variable
a = 5
```

In [5]:
```
#list
fruits = ['apple', 'banana', 'orange', 'mango']
```

In [6]:
```
name = ['apple', 5, 5.5, True]
```

In [7]:
```
type(name)
```

Out[7]:
```
list
```

In [8]:
```
name = ['apple', 5, 5.5, True, 'apple']
```

In [9]:
```
len(name)
```

Out[9]:
```
5
```

In [10]:
```
staff = ['Yuann', 'Daniyal', 'Ali', 'Sara', 'Zain']
```

In [11]:
```
staff[2]
```

Out[11]:
```
'Ali'
```

In [12]:
```
staff[2:]
```

Out[12]:
```
['Ali', 'Sara', 'Zain']
```

In [13]:
```
staff[:3]
```

Out[13]:
```
['Yuann', 'Daniyal', 'Ali']
```

Exercise:

In [14]:
```
name = ['Yuann', 'Daniyal', 'Ali', 'Sara', 'Zain']
salary = [10000, 50000, 20000, 35000, 7000]
```

- Total salary?
- Daniyal, Ali, Zain?

In [15]:
```
total = salary[0] + salary[1] + salary[2]
print(total)
```

```
80000
```

In [16]:
```
sum(salary)
```

Out[16]:
```
122000
```

append()

In [17]:
```
name = ['Yuann', 'Daniyal', 'Ali', 'Sara', 'Zain']
```

In [18]:
```
name.append('Muneer')
```

In [19]:
```
name
```

Out[19]:
```
['Yuann', 'Daniyal', 'Ali', 'Sara', 'Zain', 'Muneer']
```

In [20]:
```
name[0] = 'Asad'
```

In [21]:
```
name
```

Out[21]:
```
['Asad', 'Daniyal', 'Ali', 'Sara', 'Zain', 'Muneer']
```

In [22]:
```
name.append(6)
```

In [23]:
```
name
```

Out[23]:
```
['Asad', 'Daniyal', 'Ali', 'Sara', 'Zain', 'Muneer', 6]
```

In [24]:
```
name[1:3] = [5000, 6000]
```

In [25]:
```
name
```

Out[25]:
```
['Asad', 5000, 6000, 'Sara', 'Zain', 'Muneer', 6]
```

Insert()

In [26]:
```
name.insert(3, 'Ali')
```

In [27]:
```
name
```

Out[27]:
```
['Asad', 5000, 6000, 'Ali', 'Sara', 'Zain', 'Muneer', 6]
```

remove()

In [28]:
```python
name.remove('Zain')
```

In [29]:
```python
name
```

Out[29]:
```
['Asad', 5000, 6000, 'Ali', 'Sara', 'Muneer', 6]
```

pop()

In [30]:
```python
name.pop(2)
```

Out[30]:
```
6000
```

In [31]:
```python
name
```

Out[31]:
```
['Asad', 5000, 'Ali', 'Sara', 'Muneer', 6]
```

sort()

In [32]:
```python
fruits = ['orange', 'mango', 'apple', 'banana']
fruits.sort()
```

In [33]:
```python
fruits
```

Out[33]:
```
['apple', 'banana', 'mango', 'orange']
```

List of Lists

In [34]:
```python
emp_1 = ['Muhammad', 25, 25000, 'Male']
emp_2 = ['Qasim', 22, 50000, 'Male']
emp_3 = ['Aliza', 45000, 'Female']
```

In [35]:
```python
employees = [emp_1, emp_2, emp_3]
```

In [36]:
```python
employees
```

Out[36]:
```
[['Muhammad', 25, 25000, 'Male'],
 ['Qasim', 22, 50000, 'Male'],
 ['Aliza', 45000, 'Female']]
```

In [37]:
```python
employees[0][3]
```

Out[37]:
```
'Male'
```

In [38]:
```python
employees[1]
```

Out[38]:
```
['Qasim', 22, 50000, 'Male']
```

In [39]:
```python
employees[1][2]
```

Out[39]:
```
50000
```

Exercise:

In [40]:

```python
emp_1 = ['Muhammad', 25, 25000, 'Male']
emp_2 = ['Qasim', 22, 50000, 'Male']
emp_3 = ['Aliza', 45000, 'Female']
emp_4 = ['Hafsa', 35000, 'Female']
```

In [41]:

```python
employees = [emp_1, emp_2, emp_3, emp_4]
```

In [42]:

```python
employees
```

Out[42]:

```
[['Muhammad', 25, 25000, 'Male'],
 ['Qasim', 22, 50000, 'Male'],
 ['Aliza', 45000, 'Female'],
 ['Hafsa', 35000, 'Female']]
```

- Q:find the total of employee salary.
- Q:find out the avg salary.

In [43]:

```python
total_salary = employees[0][2] + employees[1][2] + employees[2][1] + em
```

In [44]:

```python
print(total_salary)
```

```
155000
```

In [45]:

```python
length = len(employees)
```

In [46]:

```python
avg = total_salary/length
```

In [47]:

```python
avg
```

Out[47]:

```
38750.0
```

For Loops

- For loop is used for iteration over a sequence.
- A set of statement/code is performed for each iteration.

In [48]:

```python
employees
```

Out[48]:

```
[['Muhammad', 25, 25000, 'Male'],
 ['Qasim', 22, 50000, 'Male'],
 ['Aliza', 45000, 'Female'],
 ['Hafsa', 35000, 'Female']]
```

In [49]:

```
for i in employees: #refers to item
    print(i) #indentation
```

```
['Muhammad', 25, 25000, 'Male']
['Qasim', 22, 50000, 'Male']
['Aliza', 45000, 'Female']
['Hafsa', 35000, 'Female']
```

In [50]:

```
for emp in employees:
    print(emp[0])
```

```
Muhammad
Qasim
Aliza
Hafsa
```

Exercise:

- use the employee list to create a new list 'names' and store all the employee name.

In [51]:

```
names = []
for j in employees:
    names.append(j[0])
print(names)
```

```
['Muhammad', 'Qasim', 'Aliza', 'Hafsa']
```

In [52]:

```
names
```

Out[52]:

```
['Muhammad', 'Qasim', 'Aliza', 'Hafsa']
```

range()

- It returns a sequence of numbers, generally starting from 0 and increment by 1(default), and stops one value before the specified number

range(#start, #stop, #step)

In [53]:

```
range(1)
```

Out[53]:

```
range(0, 1)
```

In [54]:

```
range(10)
```

Out[54]:

```
range(0, 10)
```

In [55]:

```
for i in range(4):
    print(i)
```

```
0
1
2
3
```

In [56]:

```
for i in range(5, 15):
    print(i)
```

```
5
6
7
8
9
10
11
12
13
14
```

In [57]:

```
for i in range(5, 15, 2):
    print(i)
```

```
5
7
9
11
13
```

In [58]:

```
for i in range(10, 0, -1):
    print(i)
```

```
10
9
8
7
6
5
4
3
2
1
```

In [59]:

```
for i in range(4, 41, 4):
    print(i)
```

```
4
8
12
16
20
24
28
32
36
40
```

Exercise:

- Extract salary from emp using for loop and range.
- fing out the total salary and avg salary

In [60]:

```python
employees
```

Out[60]:

```
[['Muhammad', 25, 25000, 'Male'],
 ['Qasim', 22, 50000, 'Male'],
 ['Aliza', 45000, 'Female'],
 ['Hafsa', 35000, 'Female']]
```

In [61]:

```python
length = len(employees)
print(length)
```

```
4
```

In [62]:

```python
lst = []
total = 0
avg = 0
for i in range(len(employees)):
    lst.append(employees[i][-2])
    total += employees[i][-2]
print(lst)
print(total)
avg = total/len(employees)
print(avg)
```

```
[25000, 50000, 45000, 35000]
155000
38750.0
```

In [ ]:

```python

```