```
#list negative indexing and slicing
s='python'
s[-5:]
```

```
'ython'
```

```
s[-5:-3]
```

```
'yt'
```

```
s[-5:-1:2]
```

```
'yh'
```

```
s[-1::-1]
```

```
'nohtyp'
```

```
s[-1::-2]
```

```
'nhy'
```

```
#list concatenation
l1 = ['python',3.13,10]
l2 = ['c',23.0,11]
l3 = l1+l2
l3
```

```
['python', 3.13, 10, 'c', 23.0, 11]
```

```
#list type
type(l3)
```

```
list
```

```
#type casting
l3 = list('python')
l3
```

```
['p', 'y', 't', 'h', 'o', 'n']
```

```
l3 = list((11,5,4))
l3
```

```
[11, 5, 4]
```

```
l3 = list({11,5,4})
l3
```

```
[11, 4, 5]
```

```
l3 = list({11:5,4:10})
l3
```

```
[11, 4]
```

```
d = {11:5,4:10}
l3 = list(d.values())
l3
```

```
[5, 10]
```

```
l3 = list(d.keys())
l3
```

```
[11, 4]
```

```
#membership operators in list
l4 = ['python3.8',10,'python3.13',11]
if 'python3.8' in l4:
    print('yes')
else:
    print('no')
```

```
yes
```

```
if 10 not in l4:
    print('yes')
else:
    print('no')
```

```
no
```

```
#identity operators in list
l4 = ['python3.8',10,'python3.13',11]
l5 = ['python3.8',10,'python3.13',11]
if l4 is l5:
    print('yes')
else:
    print('no')
```

```
no
```

```
l6=l4
if l4 is l6:
    print('yes')
else:
    print('no')
```

```
yes
```

```
#conditions in list
if 10 in l4:
    print('yes')
else:
    print('no')
```

```
yes
```

```
#loops in list
for i in l4:
  print(i)
```

```
python3.8
10
python3.13
11
```

```
for i in l4:
  print(i,end=' ')
```

```
python3.8 10 python3.13 11
```

```
for i in range(len(l4)):
  print(l4[i])
```

```
python3.8
10
python3.13
11
```

```
for i in l4:
  print(i*2)
```

```
python3.8python3.8
20
python3.13python3.13
22
```

```
for i in l4:
  print(str(i)*2)
```

```
python3.8python3.8
1010
python3.13python3.13
1111
```

```
#functions in list
l4 = ['python3.8',10,'python3.13',11]
len(l4)
```

```
4
```

```
l7 = [4,6,2,1,3]
print(max(l7))
print(min(l7))
```

```
6
1
```

```
l7.append(5)
l7
```

```
[4, 6, 2, 1, 3, 5]
```

```
l7.append('python')
l7
```

```
[4, 6, 2, 1, 3, 5, 'python']
```

```
l7.append([1,2,3])
l7
```

```
[4, 6, 2, 1, 3, 5, 'python', [1, 2, 3]]
```

```
l7.append((1,2,3))
l7
```

```
[4, 6, 2, 1, 3, 5, 'python', [1, 2, 3], (1, 2, 3)]
```

```
l7.append({1,2,3})
l7
```

```
[4, 6, 2, 1, 3, 5, 'python', [1, 2, 3], (1, 2, 3), {1, 2, 3}]
```

```
l7.append({1:2,3:4})
l7
```

```
[4, 6, 2, 1, 3, 5, 'python', [1, 2, 3], (1, 2, 3), {1, 2, 3}, {1: 2, 3: 4}]
```

```
l7.extend([313,'python3.13'])
l7
```

```
[4,
 6,
 2,
 1,
 3,
 5,
 'python',
 [1, 2, 3],
 (1, 2, 3),
 {1, 2, 3},
 {1: 2, 3: 4},
 313,
 'python3.13']
```

```
l7.extend((313,'python3.13'))
l7
```

```
[4,
 6,
```

```
      2,
      1,
      3,
      5,
      'python',
      [1, 2, 3],
      (1, 2, 3),
      {1, 2, 3},
      {1: 2, 3: 4},
      313,
      'python3.13',
      313,
      'python3.13']
```

```
l7.extend({25,'python25'})
l7
```

```
[4,
      6,
      2,
      1,
      3,
      5,
      'python',
      [1, 2, 3],
      (1, 2, 3),
      {1, 2, 3},
      {1: 2, 3: 4},
      313,
      'python3.13',
      313,
      'python3.13',
      25,
      'python25']
```

```
l7.extend({1:2,3:4})
l7
```

```
[4,
      6,
      2,
      1,
      3,
      5,
      'python',
      [1, 2, 3],
      (1, 2, 3),
      {1, 2, 3},
      {1: 2, 3: 4},
      313,
      'python3.13',
      313,
      'python3.13',
      25,
      'python25',
      1,
      3]
```

```
l7.extend({57:2020,59:2025}.keys())
l7
```

```
[4,
      6,
      2,
      1,
      3,
      5,
      'python',
      [1, 2, 3],
      (1, 2, 3),
      {1, 2, 3},
      {1: 2, 3: 4},
      313,
      'python3.13',
      313,
      'python3.13',
      25,
      'python25',
      1,
      3,
```

```
      57,
      59]


l7.extend({57:2020,59:2025}.values())
l7
```

```
[4,
 6,
 2,
 1,
 3,
 5,
 'python',
 [1, 2, 3],
 (1, 2, 3),
 {1, 2, 3},
 {1: 2, 3: 4},
 313,
 'python3.13',
 313,
 'python3.13',
 25,
 'python25',
 1,
 3,
 57,
 59,
 2020,
 2025]
```

```
l8 = [1,3.13,'python',True]
l8
```

```
[1, 3.13, 'python', True]
```

```
l8.insert(2,'c')
l8
```

```
[1, 3.13, 'c', 'python', True]
```

```
l8.insert(4,(11,22))
l8
```

```
[1, 3.13, 'c', 'python', (11, 22), True]
```

```
l9=[1,2,3]
sum(l9)
```

```
6
```

```
l10=[5,1,2]
l10.sort()
l10
```

```
[1, 2, 5]
```

```
l11=[5,1,2]
sorted(l11)
```

```
[1, 2, 5]
```

```
l11.pop()
```

```
2
```

```
l11
```

```
[5, 1]
```

```
l11.pop(0)
```

```
5
```

```
l11
```

```
[1]
```

```
l12 = [5,1,2,3,7]
l12.remove(1)
```

```
l12
```

```
[5, 2, 3, 7]
```

```
l13 = [5,1,2,3,1,7,6]
l13.remove(1)
l13
```

```
[5, 2, 3, 1, 7, 6]
```

```
l14 = [2,1,4,2,5,2,7]
l14.count(2)
```

```
3
```

```
l14.index(2)
```

```
0
```