What is difference between list and tuple?

List	Tuple
List is a mutable sequence data type	Tuple is immutable sequence data type
List provides the following mutable methods 1. Append 2. Insert 3. Remove 4. Clear 5. Sort 6. Extend 7. Pop 8. Reverse	Tuple does not provdes mutable methods. After creating tuple changes cannot be done.
The changes can be done in list after creation.	The changes cannot be done after creating tuple.
List occupy more space because it is mutable.	Tuple does not occupy more space.
List is created using []	Tuple is created using ()
"list" class represent list object	"tuple" class represent tuple object
List comprehension is possible	Tuple comprehension is not possible
List cannot used to represent data in set and dictionary	Tuple can be used to represent data in set and dictionary.
List is not hashable	Tuple is hashable
In application development list is used to represent collection mutable objects.	In application development tuple is used to represent collection of immutable object.

String
String is a collection of characters. These characters can be alphabets, digits or special characters.
The string which contains alphabets is called alphabetic string.
The string which contains alphabets or numbers is called alphanumeric string.

String is created in different ways.
1. Within single quotes
2. Within double quotes

3. Within triple quotes
4. Using str() function
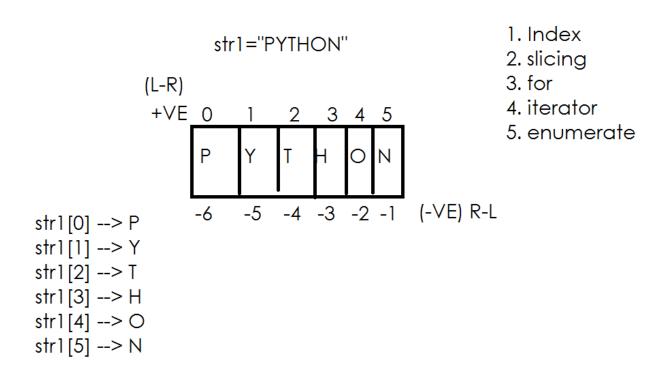
Str class or data type is used to represent string object.
String is an immutable sequence. After creating string changes are not done.

Example:

```
str1='Python Language'
str2="Python Language"
str3='''Python is
object oriented
programming language'''
str4="""Python is
object oriented
programming language"""
print(str1,str2,str3,str4,sep="\n")
str5='Python is "easy" language'
str6="Python is 'easy' language"
print(str5)
print(str6)
```

Output:
Python Language
Python Language
Python is
object oriented
programming language
Python is
object oriented
programming language
Python is "easy" language
Python is 'easy' language

str1="PYTHON"

(L-R)
+VE 0   1   2   3 4 5

| P | Y | T | H | O | N |

-6   -5   -4 -3 -2 -1   (-VE) R-L

1. Index
2. slicing
3. for
4. iterator
5. enumerate

str1[0] --> P
str1[1] --> Y
str1[2] --> T
str1[3] --> H
str1[4] --> O
str1[5] --> N

Example:
Write a program to input string and count
alphabets,digits and special characters

```
str1=input("Enter any string ")
ac=0
dc=0
sc=0
for ch in str1:
    if (ch>='A' and ch<='Z') or (ch>='a' and ch<='z'):
        ac+=1
    elif ch>='0' and ch<='9':
        dc+=1
    else:
        sc+=1

print(f'''Alphabet Count {ac}
Digit Count {dc}
Special Character Count {sc}''')
```

Output:
Enter any string python 3.12

Alphabet Count 6
Digit Count 3
Special Character Count 2

Example:
Write a program to count vowels within string

```
str1=input("Enter any string ")
vc=0
for ch in str1:
    if ch in "aeiouAEIOU":
        vc+=1

print(f'Vowel Count {vc}')
```

Output
Enter any string java
Vowel Count 2

Enter any string python
Vowel Count 1

Example of slicing string
```
>>> s1="programming"
>>> s2=s1[:]
>>> print(s1)
programming
>>> print(s2)
programming
>>> s3=s1[::-1]
>>> print(s3)
gnimmargorp
>>> s4=s1[:3]
>>> print(s4)
pro
>>> s5=s1[-3:]
>>> print(s5)
ing
```

Example:

Write a program to find input string is pal or not

```python
str1=input("Enter any String ")
str2=str1[::-1]
if str1==str2:
    print(f'{str1} is pal')
else:
    print(f'{str1} is not pal')
```

Output:
Enter any String madam
madam is pal

Enter any String java
java is not pal