

Basic Slicing:

- * Given the string text = "PythonProgramming", extract the substring "Python".
`text = "PythonProgramming"`
`text[0:6]`
`'Python'`
- * Write code to reverse the string "DataScience" using slicing.
`string="DataScience"`
`string[::-1]`
`'ecneicSataD'`
- * From the string sentence = "Machine Learning is fascinating", extract the substring "Learning".

`sentence = "Machine Learning is fascinating"`
`sentence[8:16]`
`'Learning'`
- * Given the string word = "abcdefghijkl", extract every second character.
`word = "abcdefghijkl"`
`word[::2]`
`'acegi'`
- * Use negative indexing to extract the last three characters from the string "DeepLearning".
`thestrings= "DeepLearning"`
`thestrings[-3:]`
`'ing'`
- * Given the string data = "0123456789", extract the substring "13579".
`data = "0123456789"`
`data[1::2]`
`'13579'`
- * For the string quote = "To be or not to be", extract the substring starting from "or" to the end.
`quote = "To be or not to be"`
`quote[6:]`
`'or not to be'`
- * Extract the first half of the string "ArtificialIntelligence" using slicing.

`string = "ArtificialIntelligence"`
`len(string)`

`22`

`string[0:11]`
`'ArtificiaI'`
- * Write code to extract the last half of the string "NeuralNetworks".

```
string1 ="NeuralNetworks"
```

```
len(string1) 14
```

```
string1[7:]
```

```
'etworks'
```

List Slicing Questions

- * From the list numbers = [10, 20, 30, 40, 50, 60], extract the elements from the list using inbuilt function. [30, 40].

```
numbers = [10, 20, 30, 40, 50, 60]
```

```
numbers[2:4]
```

```
[30, 40]
```

- * Write code to reverse the list fruits = ['apple', 'banana', 'cherry', 'date'] using slicing.

```
fruits = ['apple', 'banana', 'cherry', 'date']
```

```
fruits[::-1]
```

```
['date', 'cherry', 'banana', 'apple']
```

- * From the list data = [100, 200, 300, 400, 500, 600], remove the first three elements using slicing.

```
listdata = [100, 200, 300, 400, 500, 600]
```

```
listdata[3:]
```

```
[400, 500, 600]
```

- * Given the list colors = ['red', 'green', 'blue', 'yellow', 'purple'], extract the elements from 'green' to 'yellow'.

```
colors = ['red', 'green', 'blue', 'yellow', 'purple']
```

```
colors[1:4]
```

```
['green', 'blue', 'yellow']
```

Slice and Replace:

- * Modify the list animals = ['cat', 'dog', 'rabbit', 'hamster'] by replacing 'dog' and 'rabbit' with ['lion', 'tiger'].

```
animals = ['cat', 'dog', 'rabbit', 'hamster']
```

```
animals[1,2]= ['lion', 'tiger']
```

```
['cat', 'lion', 'tiger', 'hamster']
```

- Given the list scores = [75, 85, 95, 65, 55, 45], extract the last three elements using slicing.

```
scores = [75, 85, 95, 65, 55, 45]
```

```
scores[-3:]
```

```
[65, 55, 45]
```

* Write code to reverse all the elements present in the list elements of the list
items = [10, 20, 30, 40, 50, 60, 70].

```
items = [10, 20, 30, 40, 50, 60, 70]  
items[::-1]  
[70, 60, 50, 40, 30, 20, 10]
```

- * From the tuple alphabets = ('a', 'b', 'c', 'd', 'e'), extract the subtuple ('b', 'c', 'd').

```
alphabets = ('a', 'b', 'c', 'd', 'e')  
alphabets[1:4]  
('b', 'c', 'd')
```

- * Write code to reverse the tuple digits = (0, 1, 2, 3, 4, 5) using slicing.

```
digits = (0, 1, 2, 3, 4, 5)  
digits[::-1]  
(5, 4, 3, 2, 1, 0)
```

- * Given the tuple months = ('Jan', 'Feb', 'Mar', 'Apr', 'May', 'Jun'), extract the last three months using negative indexing.

```
months = ('Jan', 'Feb', 'Mar', 'Apr', 'May', 'Jun')  
months[-3:]  
('Apr', 'May', 'Jun')
```

- * From the tuple points = (1, 2, 3, 4, 5, 6), extract every second element.

```
points = (1, 2, 3, 4, 5, 6)  
points[::2]  
(1, 3, 5)
```

- * Given the tuple sequence = (0, 1, 2, 3, 4, 5, 6, 7, 8), extract the subtuple (0, 3, 6) using slicing.

```
sequence = (0, 1, 2, 3, 4, 5, 6, 7, 8)  
sequence[::3]  
(0, 3, 6)
```

- * Extract the first three elements from the tuple weekdays = ('Mon', 'Tue', 'Wed', 'Thu', 'Fri') and reverse them.

```
weekdays = ('Mon', 'Tue', 'Wed', 'Thu', 'Fri')  
1. a=weekdays[:3]  
    a[::-1]  
2. weekdays[2::-1]  
('Wed', 'Tue', 'Mon')
```

- * From the tuple languages = ('Python', 'Java', 'C++', 'Ruby', 'JavaScript'), remove the first and last elements.

```
languages = ('Python', 'Java', 'C++', 'Ruby', 'JavaScript')  
languages[1:-1]
```

```
('Java', 'C++', 'Ruby')
```

* LIST

- * Given the list numbers = [10, 20, 30, 40, 50, 60, 70], write a Python script to:
 - * Extract the first three elements.

```
numbers1 = [10, 20, 30, 40, 50, 60, 70]
```

```
Python=[10, 20, 30, 40, 50, 60, 70]
```

```
Python[:3]
```

```
[10, 20, 30]
```

- * Extract the last three elements.

```
Python[-3:]
```

```
[50, 60, 70]
```

- * Extract every second element starting from index 1.

```
Python[1::2]
```

```
[20, 40, 60]
```

- * Reverse the list .

```
Python[::-1]
```

```
[70, 60, 50, 40, 30, 20, 10]
```

- * Given the list fruits = ['apple', 'banana', 'cherry', 'date', 'fig', 'grape'], replace the middle two elements with ['mango', 'kiwi'] using slicing.

```
fruits = ['apple', 'banana', 'cherry', 'date', 'fig', 'grape']
```

```
fruits[2:4]=['mango','kiwi']
```

```
fruits
```

```
['apple', 'banana', 'mango', 'kivi', 'fig', 'grape']
```

- * Given a nested list matrix = [[1, 2, 3], [4, 5, 6], [7, 8, 9]], write code to extract the second column (i.e., [2, 5, 8]) using list comprehension and slicing.

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

```
a=[]
```

```
a.extend([m[0][1],m[1][1],m[2][1]])
```

```
[2, 5, 8]
```

- * Given the list colors = ['red', 'green', 'blue'], write a Python script to:
 - * Add 'yellow' at the end of the list.

```
colors = ['red', 'green', 'blue']
```

```
colors.append('yellow')
```

```
colors
```

```
['red', 'green', 'blue', 'yellow']
```

- *insert 'orange' at the second position.

```
colors.insert(1,'oreange')
```

```
colors
```

```
['red', 'oreange', 'green', 'blue', 'yellow']
```

- * Extend the list with another list ['purple', 'pink'].

```
colors.extend(['purple', 'pink'])
```

```
colors
```

```
['red', 'oreange', 'green', 'blue', 'yellow', 'purple', 'pink']
```

- * Given the list animals = ['cat', 'dog', 'rabbit', 'hamster'], perform the following tasks:
* Remove the last element from the list.

```
animals = ['cat', 'dog', 'rabbit', 'hamster']
```

```
animals.remove('hamster')
```

```
animals
```

```
['cat', 'dog', 'rabbit']
```

- * Remove 'dog' using an inbuilt function.

```
animals.remove('dog')
```

```
animals
```

```
['cat', 'rabbit']
```

- * Delete the first element using slicing.

```
animals[1:]
```

```
['rabbit']
```

SET

Adding Values to a Set:

Given the set even_numbers = {2, 4, 6, 8}, write code to:

```
even_numbers = {2, 4, 6, 8}
```

```
even_numbers
```

```
{8, 2, 4, 6}
```

Add the number 10 to the set.

```
even_numbers.add(10)
```

```
even_numbers
```

```
{2, 4, 6, 8, 10}
```

Add multiple numbers [12, 14] to the set.

```
even_numbers.update([12, 14])
```

```
even_numbers
```

```
{2, 4, 6, 8, 10, 12, 14}
```

Removing Values from a Set:

Given the set prime_numbers = {2, 3, 5, 7, 11}, write a Python script to:

```
numbers = {2, 3, 5, 7, 11}
```

```
numbers
```

```
{2, 3, 5, 7, 11}
```

Remove the number 7 using an inbuilt function.

```
numbers.remove(7)
```

```
numbers
```

```
{2, 3, 5, 11}
```

Attempt to remove 13 and handle any exceptions if the element is not found.

```
numbers.remove(13)
```

```
Traceback (most recent call last):
```

```
File "<pyshell#150>", line 1, in <module>
```

```
    numbers.remove(13)
```

```
KeyError: 13
```

Dictionary

Adding Key-Value Pairs to a Dictionary:

Given the dictionary student_grades = {'John': 'A', 'Emily': 'B'}, write code to:

```
student_grades = {'John': 'A', 'Emily': 'B'}
```

```
student_grades
```

```
{'John': 'A', 'Emily': 'B'}
```

Add a new student 'Sophia' with grade 'A+'.

```
student_grades['Sophia']='A+'
```

```
student_grades
```

```
{'John': 'A', 'Emily': 'B', 'Sophia': 'A+'}
```

Update 'Emily's grade to 'A'.

```
student_grades['Emily']='A'
```

```
student_grades
```

```
{'John': 'A', 'Emily': 'A', 'Sophia': 'A+'}
```

Deleting Key-Value Pairs from a Dictionary:

```
student_grades.popitem()
```

```
('Sophia', 'A+')
```

Given the dictionary `inventory = {'apple': 5, 'banana': 3, 'orange': 2}`, perform the following tasks:

```
inventory = {'apple': 5, 'banana': 3, 'orange': 2}
```

```
inventory
```

```
{'apple': 5, 'banana': 3, 'orange': 2}
```

Remove the key 'banana'.

```
inventory.pop('banana')
```

```
inventory
```

```
{'apple': 5, 'orange': 2}
```

Clear all items from the dictionary.

```
inventory.clear()
```

```
inventory
```

```
{}
```