Q1) Discuss string slicing and provide example.
Ans: String is sequence of character. Where each character is unit of text. String slicing allows to extract a substring from larger string. format of slicing - string[start:stop:step]

In [5]:
```
#example
a = "Apple"
a[2]
```

Out[5]:
```
'p'
```

In [12]:
```
b = "Hello"
b[::2]
```

Out[12]:
```
'Hlo'
```

Q 2) Explain the key feature of list in python.
Ans: 1. List maintain the order of elements. Access the element by their index. 2. List are mutable. we can change , add, remove the elements. 3. List support indexing and slicing. 4. List can contain other list , this is called nested list. 5. List are iterable.

Q3) Describe how to access, modify, and delete elements in list with example

In [13]:
```
#Ans: Access the element of list
a = [1,5,8,9,10]
a[2]
```

Out[13]:
```
8
```

In [14]:
```
#modify the element of list
a[2]=45
a
```

Out[14]:
```
[1, 5, 45, 9, 10]
```

In [17]:
```
# Delete the element of list
del a[2]
```

In [18]:
```
a
```

Out[18]:
```
[1, 5, 9, 10]
```

Q4)compare and contrast tuples and list with example.
Ans: List- List is mutable. we can add, remove, delete the element in list. Defined using square brackets '[]' Useful for collection of items that may be modified. Tuple- Tuple is immutable. we cannot add, remove, delete the element. Defined using round bracket '()' useful for collection of items where immutability is required.

In [20]:
```
#example of list where index 2 is modified
my_list = [1,5,"Hi","chetana"]
my_list[2] = "Pw"
my_list
```

Out[20]:
```
[1, 5, 'Pw', 'chetana']
```

In [25]:
```
# we can't modify the tuple
my_tuple = (5,4,9,6)
my_tuple
```

Out[25]:
```
(5, 4, 9, 6)
```

Q5) Describe the key features of sets and provide example of their use.
Ans: Sets are unorderd. Element of set do not have any specific order. Unique elements. Sets do not contain duplicate element. sets are mutable. we can add or remove the element.

In [26]:
```
#example of set
a = {5,4,5,8,2,6,5,2}
type(a)
```

Out[26]:
```
set
```

In [28]:
```
#can't access the element of set by index
a[2]
```

```
---------------------------------------------------------------------------
TypeError                                 Traceback (most recent call last)
Cell In[28], line 1
----> 1 a[2]

TypeError: 'set' object is not subscriptable
```

In [27]:
```
#set contain only unique elements
a
```

Out[27]:
```
{2, 4, 5, 6, 8}
```

Q6) Discuss the use cases of tuples and sets in python programming. Ans: Tuples and sets are two fundamental data structures in python. Tuples: 1. Tuples are used when we need to ensure that the data remains unchanged. ex. adhar card number etc Sets: Sets are useful for storing unique items. sets support mathematical operation like union, intersection,difference. For removing duplicates from list.

Q7) Describe how to add, modify and delete items in a dictionary with examples

In [30]:
```
#Ans: add the element in dictionary
my_dict = {}
my_dict['name'] = "chetana"
my_dict['age'] = 21
my_dict
```

Out[30]:
```
{'name': 'chetana', 'age': 21}
```

In [35]:
```
#modify the elements in dictionary
my_dict['age'] = 22
my_dict
```

Out[35]:
```
{'name': 'chetana', 'age': 22}
```

In [36]:
```
#delete elements in dictionary
del my_dict['age']
my_dict
```

Out[36]:
```
{'name': 'chetana'}
```

Q8) Discuss the importance of dictionary keys being immutable and provide example
Ans: In Python, dictionary keys must be immutable. This immutability requirement is crucial for maintaining the integrity and functionality of dictionaries

In [44]:
```
#example
a = {'name':'chetana',
    'age':21}
a
```

Out[44]:
```
{'name': 'chetana', 'age': 21}
```