

Tuples in Python

A built-in data type that lets us create immutable sequences of values.

```
tup = (87, 64, 33, 95, 76) #tup[0], tup[1]..
```

```
tup[0] = 43 #NOT allowed in python
```

```
tup1 = ()
```

```
tup2 = (1,) # Not tup2 = (1)
```

```
tup3 = (1, 2, 3)
```

Tuple Methods

tup = (2, 1, 3, 1)

tup.index(element) #returns index of first occurrence tup.index(1) is 1

tup.count(element) #counts total occurrences tup.count(1) is 2

Let's Practice 01

Write a program that asks the user to enter the names of their 3 favorite books and store them in a list. Then, print the list.

Let's Practice 02

Write a program to check if a list is the same when reversed (a palindrome). Use the `copy()` method to create a reversed copy of the list and compare it with the original.

- Example lists to test:
[4, 5, 6, 5, 4]
["hello", "world", "world", "hello"]

Let's Practice

Write a program to count the number of students who received a grade of "B" in the following tuple:

`("C", "D", "B", "A", "B", "C", "B", "A")`

Let's Practice

Convert the following tuple of student grades into a list and sort the grades from "A" to "D" in ascending order:
["C", "D", "A", "B", "B", "A", "D"]

Dictionary in Python

Dictionaries are used to store data values in *key:value* pairs

```
dict = {  
    "name" : "Ariful Islam",  
    "cgpa" : 96.6,  
    "marks": [98, 97, 95],  
}
```

"key" : value

Dictionary in Python

They are unordered, mutable(changeable) & don't allow duplicate keys

```
dict["name"], dict["cgpa"], dict["marks"]
```

```
dict["key"] = "value" #to assign or add new
```


Dictionary in Python

Nested Dictionaries

```
Student = {  
    "name" : "Ariful Islam",  
    "Score" : {  
        "chem" : 98,  
        "phy" : 97,  
        "math" : 95,  
    }  
}
```

```
student["score"]["math"]
```

Dictionary Methods

`myDict.keys()` #returns all keys

`myDict.values()` #returns all values

`myDict.items()` #returns all (key, val) pairs as tuples

`myDict.get("key")` #return the key according to value

`myDict.update(newDict)` #inserts the specified items to the dictionary

Set in Python

Set is the collection of the unordered items.

Each element in the set must be unique & immutable.

```
nums = { 1, 2, 3, 4 }
```

```
set2 = { 1, 2, 2, 2 }
```

#repeated elements stored only once, so it resolved to {1, 2}

```
null_set = set( )      #empty set syntax
```

Set Methods

`set.add(element)` #adds an element

`set.remove(element)` #removes the element an

`set.clear()` #empties the set

`set.pop()` #selected a random value

Set Methods

`set.union(set2)` #combines both set values & returns new

`set.intersection(set2)` #combines common values & returns new

Let's Practice

Create a dictionary to store the meanings of the following words:

"chair" : "a type of seat with four legs"

"dog" : "a domestic animal, often kept as a pet"

Let's Practice

You are given a list of programming languages taken by students. Each unique language requires a separate classroom. Write a program to determine the number of classrooms needed.

```
["Python", "Java", "C++", "Python", "JavaScript",  
"Java", "Python", "Java", "C++", "C"]
```

Let's Practice

Write a program that prompts the user to enter marks for three subjects and stores them in a dictionary. The subject names should be used as keys, and the marks as values. Print the final dictionary.

Let's Practice

Figure out a way to store 9 & 9.0 as separate values in the set.
(You can take help of built-in data types)