**Difference between List, Tuple, Set, Dictionary**

**1. List**

**Definition**:  
A **list** is an ordered, mutable collection of items, which can be of different types.

**Creation**:

* Using square brackets: list = [1, 2, 3,” Shailaja”,1+2i,2.3]
* Using the list() constructor: list = list((1, 2, 3,”Shailaja”))

**Example**:

list = [1, 2, 3, 4, 5]

**Mutability**:

* **Mutable**: Items can be added, removed, or changed.

**Functions**:

* **append():** Adds an element to the end.
* **insert():** Inserts an element at a specific position.
* **remove():** Removes the first occurrence of a specified value.
* **pop():** Removes and returns an element at a specific index.
* **sort():** Sorts the list in ascending or descending order.
* **reverse():** Reverses the order of the list.

**2. Tuple**

**Definition**:  
A **tuple** is an ordered, immutable collection of items. Like lists, items can be of different types.

**Creation**:

* Using parentheses: tuple = (1, 2, 3)
* Using the tuple() constructor: tuple = tuple([1, 2, 3])

**Example**:

tuple = (1, 2, 3, 4, 5)

**Mutability**:

* **Immutable**: Once created, elements cannot be added, removed, or changed.

**Functions**:

* **count():** Counts the occurrences of a specified value.
* **index():** Returns the index of the first occurrence of a specified value.

**3. Set**

**Definition**:  
A **set** is an unordered, mutable collection of unique items. Duplicate items are not allowed.

**Creation**:

* Using curly braces: set = {1, 2, 3}
* Using the set() constructor: my\_set = set([1, 2, 3])

**Example**:

my\_set = {1, 2, 3, 4, 5}

**Mutability**:

* **Mutable**: Items can be added or removed, but not accessed by index (since sets are unordered).

**Functions**:

* **add():** Adds an element to the set.
* **remove():** Removes a specific element (raises an error if not found).
* **discard():** Removes a specific element (does not raise an error if not found).
* **union():** Returns a set containing all elements from two sets.
* **intersection():** Returns a set with elements common to both sets.
* **difference():** Returns a set with elements in one set but not another.

**4. Dictionary**

**Definition**:  
A **dictionary** is an unordered, mutable collection of key-value pairs. Keys must be unique, but values can be duplicated.

**Creation**:

* Using curly braces: dict = {'key1': 'value1', 'key2': 'value2'}

**Example**:dict = {'name': Shailaja, 'age': 21, 'city': 'Warangal’}

**Mutability**:

* **Mutable**: Keys and values can be added, removed, or updated.

**Functions**:

* **keys():** Returns a view object of all keys.
* **values():** Returns a view object of all values.
* **items():** Returns a view object of all key-value pairs.
* **get():** Returns the value for a specified key.
* **pop():** Removes and returns the value for a specified key.
* **update():** Updates the dictionary with key-value pairs from another dictionary or iterable.

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| --- | --- | --- | --- | --- |
| **Feature** | **List** | **Tuple** | **Set** | **Dictionary** |
| Ordered | Yes | Yes | No | No |
| Mutable | Yes | No | Yes | Yes |
| Duplicates | Allowed | Allowed | Not allowed | Keys are not allowed but values can be allowed |
| Access by index | Yes | Yes | No | Only keys are allowed |
| Example | [1,2,2.3,2+2i] | (1,2,4,6,7) | {1,2,3,5,7} | {a:’shailaja’,b:21} |