ChatGPT

Python Collections - Lists, Tuples, Dictionaries, and Sets

🏷️ 1. Lists

Mutable ordered sequence of items

Syntax:

```
my_list = [1, 2, 3, 'apple']
```

Example:

```
fruits = ['apple', 'banana']
fruits.append('cherry')      # Add item
fruits[1] = 'blueberry'       # Modify
print(fruits)
```

Useful Methods:

- `append(x)` – Add item to end
- `insert(i, x)` – Insert at index
- `remove(x)` – Remove first occurrence
- `pop()` – Remove last item
- `sort()` – Sort list
- `reverse()` – Reverse list
- `len(list)` – Get length

⚠️ Errors:

- `IndexError`: Accessing index out of range
- `ValueError`: Removing non-existent value

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2. Tuples

Immutable ordered sequence of items

Syntax:

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

Example:

```
point = (10, 20)
print(point[0])
```

🔒 Properties:

- Cannot be changed (immutable)
- Faster than lists
- Can be used as dictionary keys

⚠️ Errors:

- `TypeError` on attempting to modify

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3. Dictionaries

Unordered key-value pairs

Syntax:

```
my_dict = {'name': 'Aadit', 'age': 27}
```

Example:

```
person = {'name': 'Tania', 'age': 26}
print(person['name'])
person['age'] = 27
person['city'] = 'Derby'
```

Useful Methods:

- `keys()` – List of keys
- `values()` – List of values
- `items()` – List of (key, value) tuples
- `get(key)` – Returns value or None
- `pop(key)` – Removes key
- `update({...})` – Merge another dict

⚠ Errors:

- `KeyError`: Accessing non-existent key

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4. Sets

Unordered collection of unique items

Syntax:

```
my_set = {1, 2, 3}
```

Example:

```
nums = {1, 2, 3, 2, 1}   # Duplicates auto-removed
nums.add(4)
nums.remove(2)
```

Useful Methods:

- `add(x)` – Add item
- `remove(x)` – Remove item
- `discard(x)` – Remove if exists, else do nothing
- `union()` – Combine sets
- `intersection()` – Common items
- `difference()` – Items in one, not in other

⚠ Errors:

- `KeyError`: Removing non-existent item with `remove()`

⚖ Summary Table

Feature	List	Tuple	Dictionary	Set
Ordered			(Python 3.6+:)	
Mutable				
Allows Duplicates			Keys , Values	
Indexed			By keys	
