

Python Data Structures Cheat Sheet

List

| Package/Method | Description | Code Example |
|-----------------|--|---|
| | | Syntax: <pre>1. 1 1. list_name.append(element)</pre> <div>Copied!</div> |
| append() | The `append()` method is used to add an element to the end of a list. | Example: <pre>1. 1 2. 2 1. fruits = ["apple", "banana", "orange"] 2. fruits.append("mango") print(fruits)</pre> <div>Copied!</div> |
| copy() | The `copy()` method is used to create a shallow copy of a list. | Example 1: <pre>1. 1 2. 2 3. 3 1. my_list = [1, 2, 3, 4, 5] 2. new_list = my_list.copy() print(new_list) 3. # Output: [1, 2, 3, 4, 5]</pre> <div>Copied!</div> |
| count() | The `count()` method is used to count the number of occurrences of a specific element in a list in Python. | Example: <pre>1. 1 2. 2 3. 3 1. my_list = [1, 2, 2, 3, 4, 2, 5, 2] 2. count = my_list.count(2) print(count) 3. # Output: 4</pre> <div>Copied!</div> |
| Creating a list | A list is a built-in data type that represents an ordered and mutable collection of elements. Lists are enclosed in square brackets [] and elements are separated by commas. | Example: <pre>1. 1 1. fruits = ["apple", "banana", "orange", "mango"]</pre> <div>Copied!</div> |
| del | The `del` statement is used to remove an element from list. `del` statement removes the element at the specified index. | Example: <pre>1. 1 2. 2 3. 3 1. my_list = [10, 20, 30, 40, 50] 2. del my_list[2] # Removes the element at index 2 print(my_list) 3. # Output: [10, 20, 40, 50]</pre> <div>Copied!</div> |
| | | Syntax: <pre>1. 1 1. list_name.extend(iterable)</pre> <div>Copied!</div> |
| extend() | The `extend()` method is used to add multiple elements to a list. It takes an iterable (such as another list, tuple, or string) and appends each element of the iterable to the original list. | Example: <pre>1. 1 2. 2 3. 3 4. 4 1. fruits = ["apple", "banana", "orange"] 2. more_fruits = ["mango", "grape"] 3. fruits.extend(more_fruits) 4. print(fruits)</pre> <div>Copied!</div> |
| Indexing | Indexing in a list allows you to access individual elements by their position. In Python, indexing starts from 0 for the first element and goes up to `length_of_list - 1`. | Example: <pre>1. 1 2. 2 3. 3</pre> |

```

4. 4
5. 5

1. my_list = [10, 20, 30, 40, 50]
2. print(my_list[0])
3. # Output: 10 (accessing the first element)
4. print(my_list[-1])
5. # Output: 50 (accessing the last element using negative indexing)

```

Copied!

Syntax:

```

1. 1

1. list_name.insert(index, element)

```

Copied!

insert()

The `insert()` method is used to insert an element.

Example:

```

1. 1
2. 2
3. 3

1. my_list = [1, 2, 3, 4, 5]
2. my_list.insert(2, 6)
3. print(my_list)

```

Copied!

Example:

```

1. 1
2. 2
3. 3
4. 4

```

Modifying a list

You can use indexing to modify or assign new values to specific elements in the list.

```

1. my_list = [10, 20, 30, 40, 50]
2. my_list[1] = 25 # Modifying the second element
3. print(my_list)
4. # Output: [10, 25, 30, 40, 50]

```

Copied!

Example 1:

```

1. 1
2. 2
3. 3
4. 4
5. 5
6. 6
7. 7

```

```

1. my_list = [10, 20, 30, 40, 50]
2. removed_element = my_list.pop(2) # Removes and returns the element at index 2
3. print(removed_element)
4. # Output: 30
5.
6. print(my_list)
7. # Output: [10, 20, 40, 50]

```

Copied!

pop()

`pop()` method is another way to remove an element from a list in Python. It removes and returns the element at the specified index. If you don't provide an index to the `pop()` method, it will remove and return the last element of the list by default

Example 2:

```

1. 1
2. 2
3. 3
4. 4
5. 5
6. 6
7. 7

```

```

1. my_list = [10, 20, 30, 40, 50]
2. removed_element = my_list.pop() # Removes and returns the last element
3. print(removed_element)
4. # Output: 50
5.
6. print(my_list)
7. # Output: [10, 20, 30, 40]

```

Copied!

Example:

```

1. 1
2. 2
3. 3
4. 4

```

remove()

To remove an element from a list. The `remove()` method removes the first occurrence of the specified value.

```

1. my_list = [10, 20, 30, 40, 50]
2. my_list.remove(30) # Removes the element 30
3. print(my_list)
4. # Output: [10, 20, 40, 50]

```

Copied!

Example 1:

```
1. 1
2. 2
3. 3
```

```
1. my_list = [1, 2, 3, 4, 5]
2. my_list.reverse() print(my_list)
3. # Output: [5, 4, 3, 2, 1]
```

Copied!

Syntax:

```
1. 1
```

```
1. list_name[start:end:step]
```

Copied!

Example:

```
1. 1
2. 2
3. 3
4. 4
5. 5
6. 6
7. 7
8. 8
9. 9
10. 10
11. 11
12. 12
```

```
1. my_list = [1, 2, 3, 4, 5]
2. print(my_list[1:4])
3. # Output: [2, 3, 4] (elements from index 1 to 3)
4.
5. print(my_list[:3])
6. # Output: [1, 2, 3] (elements from the beginning up to index 2)
7.
8. print(my_list[2:])
9. # Output: [3, 4, 5] (elements from index 2 to the end)
10.
11. print(my_list[::2])
12. # Output: [1, 3, 5] (every second element)
```

Copied!

Example 1:

```
1. 1
2. 2
3. 3
4. 4
```

```
1. my_list = [5, 2, 8, 1, 9]
2. my_list.sort()
3. print(my_list)
4. # Output: [1, 2, 5, 8, 9]
```

Copied!

Example 2:

```
1. 1
2. 2
3. 3
4. 4
```

```
1. my_list = [5, 2, 8, 1, 9]
2. my_list.sort(reverse=True)
3. print(my_list)
4. # Output: [9, 8, 5, 2, 1]
```

Copied!

reverse()

The `reverse()` method is used to reverse the order of elements in a list

Slicing

You can use slicing to access a range of elements from a list.

sort()

The `sort()` method is used to sort the elements of a list in ascending order. If you want to sort the list in descending order, you can pass the `reverse=True` argument to the `sort()` method.

Dictionary

| Package/Method | Description | Code Example |
|------------------|---|---|
| Accessing Values | You can access the values in a dictionary using their corresponding <code>keys</code> . | <p>Syntax:</p> <pre>1. 1</pre> <pre>1. Value = dict_name["key_name"]</pre> <p>Copied!</p> <p>Example:</p> <pre>1. 1 2. 2</pre> <pre>1. name = person["name"] 2. age = person["age"]</pre> |

| | | |
|-----------------------|--|---|
| | | <div>Copied!</div> <div>Syntax:</div> <div>1. 1</div> <div>1. dict_name[key] = value</div> |
| Add or modify | Inserts a new key-value pair into the dictionary. If the key already exists, the value will be updated; otherwise, a new entry is created. | <div>Copied!</div> <div>Example:</div> <div>1. 1</div> <div>2. 2</div> <div>1. person["Country"] = "USA" # A new entry will be created.</div> <div>2. person["city"] = "Chicago" # Update the existing value for the same key</div> |
| | | <div>Copied!</div> <div>Syntax:</div> <div>1. 1</div> <div>1. dict_name.clear()</div> |
| clear() | The `clear()` method empties the dictionary, removing all key-value pairs within it. After this operation, the dictionary is still accessible and can be used further. | <div>Copied!</div> <div>Example:</div> <div>1. 1</div> <div>1. grades.clear()</div> |
| | | <div>Copied!</div> <div>Syntax:</div> <div>1. 1</div> <div>1. new_dict = dict_name.copy()</div> |
| copy() | Creates a shallow copy of the dictionary. The new dictionary contains the same key-value pairs as the original, but they remain distinct objects in memory. | <div>Copied!</div> <div>Example:</div> <div>1. 1</div> <div>2. 2</div> <div>1. new_person = person.copy()</div> <div>2. new_person = dict(person) # another way to create a copy of dictionary</div> |
| | | <div>Copied!</div> <div>Example:</div> <div>1. 1</div> <div>2. 2</div> <div>1. dict_name = {} #Creates an empty dictionary</div> <div>2. person = { "name": "John", "age": 30, "city": "New York"}</div> |
| Creating a Dictionary | A dictionary is a built-in data type that represents a collection of key-value pairs. Dictionaries are enclosed in curly braces `{}`. | <div>Copied!</div> <div>Syntax:</div> <div>1. 1</div> <div>1. del dict_name[key]</div> |
| | | <div>Copied!</div> <div>Example:</div> <div>1. 1</div> <div>1. del person["Country"]</div> |
| del | Removes the specified key-value pair from the dictionary. Raises a `KeyError` if the key does not exist. | <div>Copied!</div> <div>Syntax:</div> <div>1. 1</div> <div>1. items_list = list(dict_name.items())</div> |
| | | <div>Copied!</div> <div>Example:</div> <div>1. 1</div> <div>1. info = list(person.items())</div> |
| items() | Retrieves all key-value pairs as tuples and converts them into a list of tuples. Each tuple consists of a key and its corresponding value. | <div>Copied!</div> <div>Example:</div> <div>1. 1</div> |
| | | <div>Copied!</div> <div>Example:</div> <div>1. 1</div> |
| key existence | You can check for the existence of a key in a dictionary using the `in` keyword | <div>Copied!</div> <div>Example:</div> <div>1. 1</div> |

```
2. 2
1. if "name" in person:
2.     print("Name exists in the dictionary.")
```

Copied!

Syntax:

```
1. 1
1. keys_list = list(dict_name.keys())
```

Copied!

Example:

```
1. 1
1. person_keys = list(person.keys())
```

Copied!

Syntax:

```
1. 1
1. dict_name.update({key: value})
```

Copied!

Example:

```
1. 1
1. person.update({"Profession": "Doctor"})
```

Copied!

Syntax:

```
1. 1
1. values_list = list(dict_name.values())
```

Copied!

Example:

```
1. 1
1. person_values = list(person.values())
```

Copied!

keys()

Retrieves all keys from the dictionary and converts them into a list. Useful for iterating or processing keys using list methods.

update()

The `update()` method merges the provided dictionary into the existing dictionary, adding or updating key-value pairs.

values()

Extracts all values from the dictionary and converts them into a list. This list can be used for further processing or analysis.

Sets

| Package/Method | Description | Code Example |
|----------------|---|---|
| | | Syntax: <pre>1. 1 1. set_name.add(element)</pre> |
| add() | Elements can be added to a set using the <code>add()</code> method. Duplicates are automatically removed, as sets only store unique values. | <p>Copied!</p> <p>Example:</p> <pre>1. 1 1. fruits.add("mango")</pre> <p>Copied!</p> |
| clear() | The <code>clear()</code> method removes all elements from the set, resulting in an empty set. It updates the set in-place. | <p>Copied!</p> <p>Example:</p> <pre>1. 1 1. fruits.clear()</pre> <p>Copied!</p> |
| copy() | The <code>copy()</code> method creates a shallow copy of the set. Any modifications to the copy won't affect the original set. | <p>Copied!</p> <p>Syntax:</p> <pre>1. 1 1. new_set = set_name.copy()</pre> <p>Copied!</p> |

Defining Sets

A set is an unordered collection of unique elements. Sets are enclosed in curly braces `{}`. They are useful for storing distinct values and performing set operations.

discard()

Use the `discard()` method to remove a specific element from the set. Ignores if the element is not found.

issubset()

The `issubset()` method checks if the current set is a subset of another set. It returns True if all elements of the current set are present in the other set, otherwise False.

issuperset()

The `issuperset()` method checks if the current set is a superset of another set. It returns True if all elements of the other set are present in the current set, otherwise False.

pop()

The `pop()` method removes and returns an arbitrary element from the set. It raises a `KeyError` if the set is empty. Use this method to remove elements when the order doesn't matter.

remove()

Use the `remove()` method to remove a specific element from the set. Raises a `KeyError` if the element is not found.

Example:

```
1. 1
1. new_fruits = fruits.copy()
```

Copied!

Example:

```
1. 1
2. 2

1. empty_set = set() #Creating an Empty Set
2. fruits = {"apple", "banana", "orange"}
```

Copied!

Syntax:

```
1. 1
1. set_name.discard(element)
```

Copied!

Example:

```
1. 1
1. fruits.discard("apple")
```

Copied!

Syntax:

```
1. 1
1. is_subset = set1.issubset(set2)
```

Copied!

Example:

```
1. 1
1. is_subset = fruits.issubset(colors)
```

Copied!

Syntax:

```
1. 1
1. is_superset = set1.issuperset(set2)
```

Copied!

Example:

```
1. 1
1. is_superset = colors.issuperset(fruits)
```

Copied!

Syntax:

```
1. 1
1. removed_element = set_name.pop()
```

Copied!

Example:

```
1. 1
1. removed_fruit = fruits.pop()
```

Copied!

Syntax:

```
1. 1
1. set_name.remove(element)
```

Copied!

Example:

```
1. 1
1. fruits.remove("banana")
```

Copied!

Set Operations

Perform various operations on sets: `union`, `intersection`, `difference`, `symmetric difference`.

Syntax:

1. 1
2. 2
3. 3
4. 4

```
1. union_set = set1.union(set2)
2. intersection_set = set1.intersection(set2)
3. difference_set = set1.difference(set2)
4. sym_diff_set = set1.symmetric_difference(set2)
```

Copied!

Example:

1. 1
2. 2
3. 3
4. 4

```
1. combined = fruits.union(colors)
2. common = fruits.intersection(colors)
3. unique_to_fruits = fruits.difference(colors)
4. sym_diff = fruits.symmetric_difference(colors)
```

Copied!

Syntax:

1. 1

```
1. set_name.update(iterable)
```

Copied!

Example:

1. 1

```
1. fruits.update(["kiwi", "grape"])
```

Copied!

update()

The `update()` method adds elements from another iterable into the set. It maintains the uniqueness of elements.



Skills Network