ChatGPT

🏷️ Python Lists and Operations - Notes

What is a List?

A **list** in Python is an **ordered, mutable** collection that can hold elements of different data types.

Syntax:

```
my_list = [1, 2, 3, "apple", True]
```

- Can be empty: `empty_list = []`
- Can contain mixed types: `mix = [1, "a", 3.5]`

Accessing Elements

By Index:

```
my_list = [10, 20, 30]
print(my_list[0])  # 10
```

Negative Indexing:

```
print(my_list[-1])  # 30 (last element)
```

Slicing:

```
print(my_list[1:3])  # [20, 30]
```

Modifying Lists

Change Item:

```
my_list[1] = 25
```

Append Item:

```
my_list.append(40)
```

Insert at Position:

```
my_list.insert(1, 15)  # inserts 15 at index 1
```

Remove by Value:

```
my_list.remove(25)
```

Remove by Index:

```
my_list.pop(0)
```

Clear Entire List:

```
my_list.clear()
```

Looping Through a List

```
for item in my_list:
    print(item)
```

With index:

```
for index, item in enumerate(my_list):
    print(index, item)
```

🔍 Search and Check

Check if Value Exists:

```
if 10 in my_list:
    print("Found")
```

Count Occurrences:

```
my_list.count(10)
```

Find Index:

```
my_list.index(10)
```

Length, Sort and Reverse

Get Length:

```
len(my_list)
```

Sort (ascending):

```
my_list.sort()
```

Reverse Order:

```
my_list.reverse()
```

List Comprehension

Compact way to create a list based on an iterable

```
squares = [x**2 for x in range(5)]
```

With condition:

```
evens = [x for x in range(10) if x % 2 == 0]
```

⚠ Common Errors

Error	Cause
IndexError	Accessing an invalid index

Error	Cause
ValueError	Removing a value not in list
TypeError	Mixing incompatible data types

Best Practices

- Use descriptive names: `students = ["Aadit", "Tania"]`
- Use `in` to check before `remove()` or `index()`
- Avoid modifying a list while looping over it
