What is a List?

A **list** is a type of variable in Python that can **store multiple values** — like names, numbers, or any group of items — **all in one place**.

You can think of it like a **container**, **bag**, or **basket** that holds many things inside.

Real-Life Example:

Your shopping list:

```
["apple", "banana", "milk", "bread"]
```

Your best friends:

```
["Anjali", "Raj", "Tina"]
```

Creating a List

Use **square brackets [ ]**, and separate items with **commas ,** .

```
fruits = ["apple", "banana", "mango"]
print(fruits)
```

Output:

```
['apple', 'banana', 'mango']
```

A List Can Store:

Type	Example

Strings (text)	`["red", "blue", "green"]`
Numbers	`[10, 20, 30]`
Mixed data	`["Amit", 25, "Delhi"]`
Empty list	`[]` (no items yet)

Lists Can Be Changed (They are *Mutable*)

You can **add**, **remove**, or **change** items in a list —

```
colors = ["red", "blue", "green"]

colors[0] = "yellow"   # change 'red' to 'yellow'
print(colors)
```

Output:

```
['yellow', 'blue', 'green']
```

Why Use Lists?

You don't need 10 separate variables to store 10 things.
You can loop through all items easily.
You can sort, search, or modify items in one place.

What is Indexing?

Every item in a list has a **position number**, called its **index**.

Indexing starts from **0**.

Example:

fruits = ["apple", "banana", "mango"]

Index	0	1	2
Item	apple	banana	mango

To get "banana":

print(fruits[1])

Output:

banana

Negative Indexing

You can also count from the **end** using **negative numbers**.

print(fruits[-1]) # Last item → mango
print(fruits[-2]) # Second last → banana

Index (negative)	-3	-2	-1
Item	apple	banana	mango

Accessing by Index — Examples

```
colors = ["red", "blue", "green", "yellow"]

print(colors[0])     # red
print(colors[2])     # green
print(colors[-1])    # yellow
print(colors[-3])    # blue
```

Index Error

If you try to access an index that doesn't exist:

```
print(colors[5])
```

❌ You'll get:

```
IndexError: list index out of range
```

Always make sure the index is within the length of the list.

Use with len() to access last item

```
names = ["Anjali", "Ravi", "Tina"]
last_index = len(names) - 1

print("Last name:", names[last_index])
```

Output:

```
Last name: Tina
```

Try these simple exercises:

Practice Questions:

1. Create a list of your **5 favorite foods** and print it

2. Create a list of 3 numbers and print them

3. Create a list with mixed types: your name, age, and city

4. Create an **empty list** named `my_list`

5. Write a list of 4 hobbies and print the 2nd hobby

6. Print the first and last item from this list:

```
names = ["Ankit", "Pooja", "Sana", "Ravi"]
```

Practice Questions

```
1. Create a list of 4 animals and print the first and last

2. Write a list of 5 numbers, print the middle one

3. Try to access list[100] from a 3-item list — what error do you
   get?

4. Print the second last item using negative indexing
```

5. Store your 3 favorite movies in a list and print each one using index

6. Create a list of ["sun", "moon", "stars", "sky"] and print:

  ○ The first 2 items

  ○ The last 2 items

Why Modify a List?

Python lists are **mutable**, which means you can **change** them:

- Add new items

- Change old items

- Remove things you don't need

Adding Items to a List

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a) `.append()` → **Adds an item at the end**

```
fruits = ["apple", "banana"]
fruits.append("mango")
print(fruits)
```

Output:

```
['apple', 'banana', 'mango']
```

b) `.insert(index, value)` → **Adds at a specific position**

```
fruits = ["apple", "banana"]
fruits.insert(1, "orange")
print(fruits)
```

Output:

```
['apple', 'orange', 'banana']
```

Changing (Updating) Items in a List

Just use **indexing** and =:

```
fruits = ["apple", "banana", "mango"]
fruits[1] = "grape"    # replace 'banana'
print(fruits)
```

Output:

```
['apple', 'grape', 'mango']
```

4. Removing Items from a List

a) `.remove(value)` → **Removes by value**

```
colors = ["red", "blue", "green"]
colors.remove("blue")
print(colors)
```

Output:

```
['red', 'green']
```

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b) `.pop(index)` → Removes item at specific position

```python
colors = ["red", "blue", "green"]
colors.pop(0)  # removes 'red'
print(colors)
```

Output:

```
['blue', 'green']
```

If no index is given, `.pop()` removes the **last** item.

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c) `del` → Delete using index (no return)

```python
nums = [10, 20, 30]
del nums[1]
print(nums)
```

Output:

```
[10, 30]
```

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d) `.clear()` → Removes everything

```python
items = ["pen", "pencil"]
items.clear()
print(items)
```

Output:

```
[]
```

Practice Questions

Let students try these after learning:

1. Create a list of 3 hobbies. Add a 4th one using `.append()`

2. Insert `"cricket"` at the 2nd position of your sports list

3. Change the 1st item of a list to `"Updated"`

4. Remove `"banana"` from this list: `["apple", "banana", "cherry"]`

5. Pop the last item of `[1, 2, 3, 4]` and print the new list

6. Delete the 2nd item of `["A", "B", "C", "D"]` using `del`

7. Clear an entire list and print it

8. Ask the user for an item and add it to a shopping list using `.append()`