# Lists in Python

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## 1. What Is a List in Python?

A list is an **ordered collection of objects**. Objects can be Integer objects, Float objects, String objects, Boolean objects, etc.

A list is written using **square brackets [ ]**, and its objects are separated by commas.

For example:

```
numbers = [10, 20, 30, 40, 50]
```

**Here:**

- numbers is the name referring to the list.
- [10, 20, 30, 40, 50] is the list object.
- The list contains five integer objects.
- The objects appear in a particular order.

## 2. Why Do We Need Lists?

Consider a program that needs to store the **marks of 100 students.**

**Creating 100 separate variables would be inconvenient:**

```
mark1 = 85
mark2 = 72
mark3 = 91
...
mark100 = 76
```

**Instead, we can store all the marks in one list:**

```
marks = [85, 72, 91, 68, 77]
```

The main purpose of a list is therefore to **organize and store multiple objects together.**

## 3. Where Are Lists Commonly Used?

- marks of students
- names of students
- prices of products
- temperatures
- ages
- measurements
- sensor readings

## 4. Creating a List

The simplest way to create a list is:

```
my_list = []
```

**This creates an empty list.**

We can also create a list containing objects:

```
numbers = [10, 20, 30, 40, 50]
```

**Another example:**

```
names = ["Ram", "John", "Ali", "Ravi", "David"]
```

## 5. Lists Can Store Different Types of Objects

A Python list can contain objects of different data types in the same list.

```
student = ["Ravi", 20, 85.5, True]
```

- "Ravi" is a string object.
- 20 is an integer object.
- 85.5 is a float object.
- True is a Boolean object.

## 6. Important Characteristics of Python Lists

- Lists are ordered collections.
- Lists can contain multiple objects.
- Lists are written using square brackets [ ].
- List objects are separated by commas.
- A list can contain objects of the same type or different types.
- A list can be empty.

## 7. Python List Compared with C/C++/Java Arrays

A simple comparison:

| C / C++ / Java | Python List |
|---|---|
| Arrays generally store elements of the same data type. | A list can store objects of different data types. |
| Array size is usually fixed when created. | A list can grow or shrink dynamically. |
| Array syntax and features depend on the language. | Python provides a simple and flexible list syntax. |
| Arrays are commonly used for collections of similar data. | Lists are widely used to organize and store multiple objects. |

## 8. Simple Program Using a List

Example: Display the marks stored in a list.

```
marks = [85, 72, 91, 68, 77]
```

```
print(marks)
```

**Output:** **[85, 72, 91, 68, 77]**

## 9. Simple Program to Display List Objects One by One

```
names = ["Ram", "John", "Ali", "Ravi", "David"]

for name in names:
    print(name)
```

Output:

Ram

John

Ali

Ravi

David

## 10. Key Points to Remember

- A list is an ordered collection of objects.
- Square brackets [ ] are used to create a list.
- Commas separate the objects in a list.
- A list can contain integers, floats, strings, Boolean values, and other objects.
- Lists make it easier to organize and work with multiple values.
- An empty list is created using [].