Day 12

Introduction to Lists in Python:

What is a List?

A list is a collection of multiple values stored in one variable.

Lists can store:

- Numbers
- Strings
- Mixed data types
- Even other lists

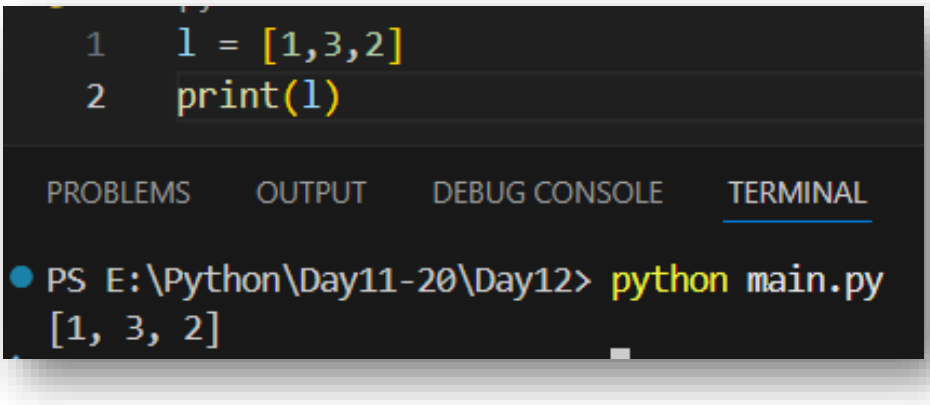
Creating a List:

numbers = [1, 2, 3, 4]
names = ["Aditya", "Python", "Code"]
mixed = [1, "Hello", 3.5, True]

Important Points to Remember:

- Lists use square brackets []
- Indexing starts from 0
- Lists are mutable
- Can store mixed data types
- Can be nested

Example: creating a basic list



Example: printing the type of list

```
1   l = [1,3,2]
2   print(type(l))
```

```
PROBLEMS  OUTPUT  DEBUG CONSOLE  TERMINAL

PS E:\Python\Day11-20\Day12> python main.py
<class 'list'>
```

Example: printing using the index.

```
4   l = [1, 3, 2]
5   print(l[0])
6   print(l[1])
```

```
PROBLEMS  OUTPUT  DEBUG CONSOLE  TERMINAL

PS E:\Python\Day11-20\Day12> python main.py
1
3
```

Example: lists can be edited

```
4   l = [1, 3, 2]
5   l[1] = 5
6   print(l)
```

```
PROBLEMS  OUTPUT  DEBUG CONSOLE  TERMINAL  PORTS

PS E:\Python\Day11-20\Day12> python main.py
[1, 5, 2]
```

Example: other data types can also be stored in the lists

```
8   l = [1, 3, 2, "Aditya", 'Utsav', True, 5.6]
9   print(l)

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PS E:\Python\Day11-20\Day12> python main.py
[1, 3, 2, 'Aditya', 'Utsav', True, 5.6]
```

Example: negative indexing in lists

```
11  l =  [1, 3, 2]
12  print(l[-1])  # This will print the last element of the list which is 2
13  print(l[-2])  # This will print the second last element of the list which is 3

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PS E:\Python\Day11-20\Day12> python main.py
2
3
```

Example: Index out of range error

```
15  l = [1, 3, 2, 5, 4]
16  l[5] = 6  # This will raise an IndexError because index 5 is out of range
17  print(l)

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PS E:\Python\Day11-20\Day12> python main.py
Traceback (most recent call last):
  File "E:\Python\Day11-20\Day12\main.py", line 16, in <module>
    l[5] = 6  # This will raise an IndexError because index 5 is out of range
    ~^^^
IndexError: list assignment index out of range
```
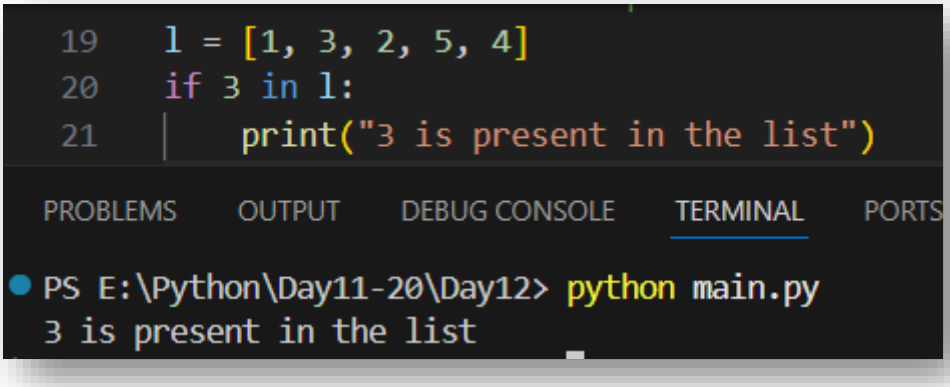
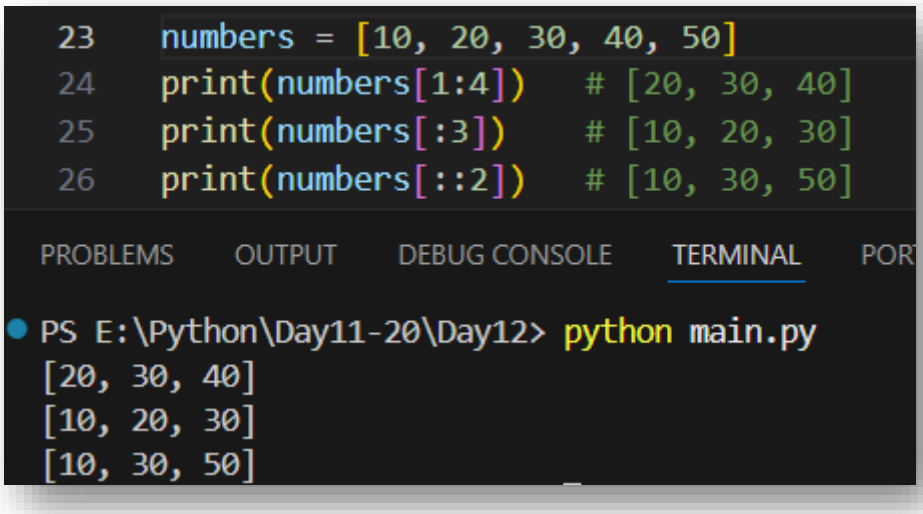
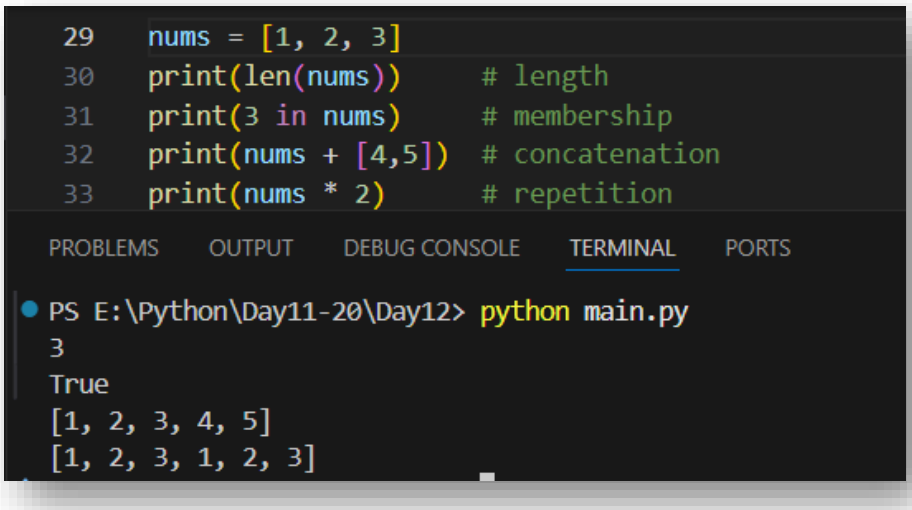

Example: checking if an element is present in the list or not.



Example: slicing in the list

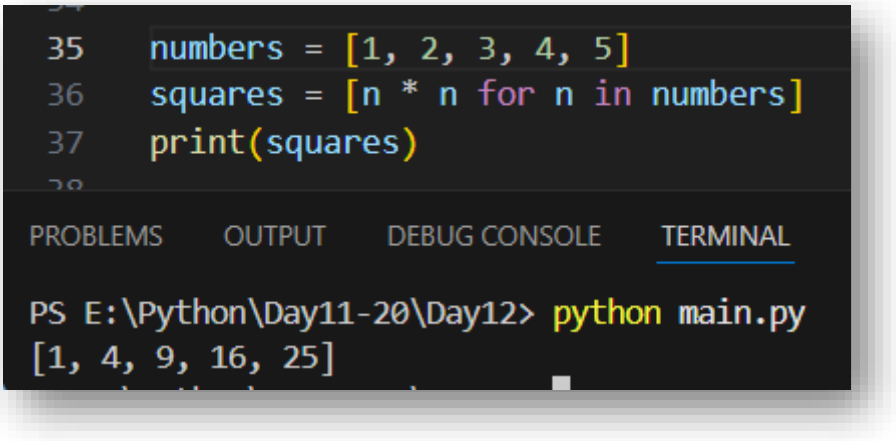


Example: some common list operations



List Comprehension: List comprehension is a short and easy way to create a list using a loop in one line.

Example:



- for n in numbers → loop through the list
- n * n → square each number
- [] → store results in a new list

Basically,

- List comprehension creates lists in one line
- Syntax: [expression for item in iterable]
- Can include if condition
- Cleaner and faster than normal loops

Summary:

- List stores multiple values in one variable
- Created using []
- Supports indexing and slicing
- Values can be changed
- Used to store and manage collections

--The End--