■ Python Slice Operator Notes

1. What is Slicing?

Slicing is a way to extract a portion (subsequence) of a sequence type like strings, lists, or tuples.
Syntax: sequence[start:stop:step]

2. Parameters

- start → index to begin slice (inclusive). Default: 0.
- stop → index to end slice (exclusive). Default: len(sequence).
- step → interval between elements. Default: 1.

3. Examples

text = 'Python'

text[0:4] → 'Pyth'
text[:4] → 'Pyth'
text[2:] → 'thon'
text[::2] → 'Pto'
text[::-1] → 'nohtyP'

nums = [10, 20, 30, 40, 50]
nums[1:4] → [20, 30, 40]
nums[:3] → [10, 20, 30]
nums[::2] → [10, 30, 50]

4. Negative Indexing

Negative indices count from the end.
text[-4:-1] → 'tho'
text[-1] → 'n'

5. Step Values

- Positive step → slice left to right.
- Negative step → slice right to left.
text[::-1] → reverse entire string
nums[4:1:-1] → [50, 40, 30]

6. Common Use Cases

- Reversing a string/list: seq[::-1]
- Extracting substrings: text[start:end]
- Skipping elements: nums[::2]
- Cloning a sequence: nums[:] (shallow copy)