Module 14 Python – Collections Functions And Modules

1. Understanding how to create and access elements in a list.

- List is collection of data type that is store multiple value in single variable.
- List is mutable.
- A list is an ordered, changeable.
- List define with [ ] **square brackets.**

```
list = [1, 2, 3]

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

mixed = [1, "two", 3.0, True]
```

- Accessing Elements by Index :

  - Positive Indexing

  Python lists are **zero-indexed**, i.e. first element is index 0.
  Attempting to access an index outside the list range raises.

  - Negative Indexing

  Negative indices count from the end: -1 is the last element, -2 is the second last

- Lists are created with [] or list(iterable).
- Access elements via list[index]:
- positive indexes from the start (0, 1, 2, …).
- negative indexes from the end (−1, −2, …).

2. Indexing in lists (positive and negative indexing).

- indexing means accessing elements from a list using their position.
- Python lists are zero-indexed, which means counting starts from **0**.

  - Positive Indexing

    - Indexes start from 0 and increase to the length of the list minus one.

```
fruits = ["apple", "banana", "orange”]
print(fruits[0])  # Output: apple
print(fruits[1])  # Output: banana
print(fruits[2])  # Output: orange
```

- Negative Indexing

    - Negative indexing starts from -1 (last element) and goes backwards.

```
fruits = ["apple", "banana", "orange"]
print(fruits[-1])  # Output: orange
print(fruits[-2])  # Output: banana
print(fruits[-3])  # Output: apple
```

3. Slicing a list: accessing a range of elements.

- **What is List Slicing?**

slicing is a way to extract a **subsequence** (a new list) from an existing list using the start:end:step pattern. it's written as: sub = lst[start:end:step]

start: Index where the slice begins (inclusive)
stop: Index where the slice ends (exclusive)
step: Interval between elements (optional)

Example:

```
fruits = ["apple", "banana", "cherry", "date", "elderberry"]
print(fruits[1:4])  # Output: ['banana', 'cherry', 'date']
print(fruits[:3])   # Output: ['apple', 'banana', 'cherry']
print(fruits[2:])   # Output: ['cherry', 'date', 'elderberry']
print(fruits[-3:])    # Output: ['cherry', 'date', 'elderberry']
print(fruits[-4:-1])  # Output: ['banana', 'cherry', 'date']
```