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Python - Collections, Functions And Modules In Python Batch – 10\_june\_Python;

**Module – 7**

**3. Working with Lists Theory:**

**Q1]. Iterating over a list using loops.**

**Using a for loop:**

**This is the most common and Pythonic way to iterate over a list.**

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

**for fruit in fruits:**

**print(fruit)**

**Using for loop with index:**

**Sometimes you may want the index as well.**

**for i in range(len(fruits)):**

**print(f"Index {i}: {fruits[i]}")**

**🔹 Using while loop:**

**i = 0**

**while i < len(fruits):**

**print(fruits[i])**

**i += 1**

**Q2]. Sorting and reversing a list using sort(), sorted(), and reverse().**

**sort() method**

* **Sorts the list in-place (modifies original list).**
* **Default is ascending order.**
* **Can sort numbers, strings, or mixed types (if comparable).**

**numbers = [5, 2, 9, 1]**

**numbers.sort()**

**print(numbers) # Output: [1, 2, 5, 9]**

* **For descending order:**

**numbers.sort(reverse=True)**

**sorted() function**

* **Returns a new sorted list.**
* **Original list remains unchanged.**

**data = [3, 1, 4, 2]**

**sorted\_data = sorted(data)**

**print(sorted\_data) # [1, 2, 3, 4]**

**print(data) # [3, 1, 4, 2] (unchanged)**

**reverse() method**

* **Reverses the list in-place, without sorting.**

**letters = ['a', 'b', 'c']**

**letters.reverse()**

**print(letters) # ['c', 'b', 'a']**

**Q3]. Basic list manipulations: addition, deletion, updating, and slicing.**

**1) Addition (Adding Elements)**

**Using append() – adds to end:**

**my\_list = [1, 2]**

**my\_list.append(3) # [1, 2, 3]**

**Using insert(index, value) – adds at position:**

**my\_list.insert(1, "a") # [1, 'a', 2, 3]**

**Using + operator – concatenation:**

**new\_list = my\_list + [4, 5]**

**2) Deletion (Removing Elements)**

**Using remove(value) – removes by value:**

**my\_list.remove("a") # removes 'a'**

**Using pop(index) – removes by index:**

**my\_list.pop(0) # removes 1st element**

**Using del keyword:**

**del my\_list[1] # deletes item at index 1**

**3) Updating Elements**

**You can update elements directly by index:**

**my\_list[0] = 100 # changes first element to 100**

**4) Slicing (Accessing a Range)**

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

**print(numbers[1:4]) # [20, 30, 40]**

**print(numbers[:3]) # [10, 20, 30]**

**print(numbers[::2]) # [10, 30, 50]**

**print(numbers[::-1]) # [50, 40, 30, 20, 10] (reverse list)**