

SET 3

Q1. (Data Structures – 5 Marks)

Use AI to create a Python program implementing a Queue using the collections.deque module.

Perform:

- Enqueue 4 values
- Dequeue 1 value
- Display queue

Explain AI's suggestion accuracy.

```
Task1.py > ...
1  from collections import deque
2
3  # Implementing Queue using collections.deque
4  queue = deque()
5
6  # Enqueue 4 values
7  queue.append(10)
8  queue.append(20)
9  queue.append(30)
10 queue.append(40)
11
12 # Dequeue 1 value
13 dequeued_value = queue.popleft()
14
15 # Display queue
16 print("Current Queue:", list(queue))
17
```

OUTPUT:

```
IAC/Lab Test-3/Task1.py"
```

```
Current Queue: [20, 30, 40]
```

Q2. (Algorithms – 5 Marks)

With AI assistance, implement Binary Search in Python.

Test it on the sorted array:

[10, 20, 30, 40, 50, 60] to search for the number 40

```
Task2.py > binary_search
1 def binary_search(arr, target):
2     left = 0
3     right = len(arr) - 1
4
5     while left <= right:
6         mid = (left + right) // 2
7         if arr[mid] == target:
8             return mid # Return the index where target is found
9         elif arr[mid] < target:
10            left = mid + 1
11        else:
12            right = mid - 1
13    return -1 # Not found
14
15 # Test the binary_search function
16 arr = [10, 20, 30, 40, 50, 60]
17 target = 40
18
19 result = binary_search(arr, target)
20 if result != -1:
21     print(f"Element {target} found at index {result}")
22 else:
23     print(f"Element {target} not found in array")
24
```

OUTPUT:

```
PS C:\Users\DEEKSHA\OneDrive\Desktop\AIAC\Lab Test-3> & C:/Users/DEE
:/Users/DEEKSHA/OneDrive/Desktop/AIAC/Lab Test-3/Task2.py"
Element 40 found at index 3
```