SNS COLLEGE OF ENGINEERING
Kurumbapalayam (Po), Coimbatore – 641 107
AN AUTONOMOUS INSTITUTION
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DEPARTMENT OF INFORMATION TECHNOLOGY

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23ITB202 - Python programming

Linear Search

A linear search is a straightforward method for finding a target value in a list by checking each element one by one from the beginning until it finds the target. In the given Python program, the `linear_search` function accepts two inputs: `arr` (a list of elements) and `target` (the value to be searched). It iterates through each element in the list `arr` using a `for` loop. For each element, it checks if the element matches the target value. If a match is found, the function returns the index of that element, indicating the position where the target was found in the list. If the loop completes without finding the target, the function returns `-1`, indicating that the target is not present in the list. This method works well for small lists but can be slower for large lists, as it has to potentially check every element until it finds the target or concludes the element is not there.

Program:

```
def linear_search(arr, target):
    for i in range(len(arr)):
        if arr[i] == target:
            return i  # Return the index of the target
    return -1  # Return -1 if target is not found

# Example usage
numbers = [10, 23, 45, 70, 11, 15]
target = 70

result = linear_search(numbers, target)
if result != -1:
    print(f"Element found at index {result}")
else:
    print("Element not found in the list")
```

Explanation

1. The function `linear_search` takes a list (`arr`) and a `target` value.
2. It iterates through each element in `arr`.
3. If it finds an element equal to `target`, it returns the index of that element.
4. If it completes the loop without finding `target`, it returns `-1`, indicating that the target is not present.

Output:
Element found at index 3