Reccursion Note:

Reccursive Function Exmaple

```
def recursive_sum(arr):
    # Base case: If the array is empty, the sum is 0.
    if not arr:
        return 0
    # Recursive case: Calculate the sum of elements using recursion.
    else:
        # The sum is the first element plus the sum of the rest of the elements.
        return arr[0] + recursive_sum(arr[1:])



print(recursive_sum([1,2,3,4,5]))
```

Algorithm Explaination:

Now, let's walk through the function execution step by step for recursive_sum([1, 2, 3, 4, 5]):

recursive_sum([1, 2, 3, 4, 5]) is called.
The base case is checked: The array is not empty, so we move to the else block.
Inside the else block:
a. We return 1 + recursive_sum([2, 3, 4, 5]).

Now, the recursive call is recursive_sum([2, 3, 4, 5]):

recursive_sum([2, 3, 4, 5]) is called.
The base case is checked: The array is not empty, so we move to the else block.
Inside the else block:
a. We return 2 + recursive_sum([3, 4, 5])

Then We Call recursive_sum([3, 4, 5])
We return 3 + recursive_sum([4, 5])

Then We Call recursive_sum([4, 5])
We return 4 + recursive_sum([5])

Then We Call recursive_sum([5])
We return 5+ recursive_sum([])

Importance Come Here Now Our Array is Empty

That Means When We Call recursive_sum([]) It Return 1 As Per Condition We Set In The Function.

From Now recurrsive([]) returns 1 the magic starts from here the steps we store/ returned liked lets give each step a sequence.

{

1. **recursive_sum([1,2,3,4,5]) = return 1 + recursive_sum([2, 3, 4, 5])**
2. **recursive_sum([2,3,4,5]) = return 2 + recursive_sum([3, 4, 5]),**
3. **recursive_sum([3,4,5]) = return 3 + recursive_sum([4, 5]),**
4. **recursive_sum([4,5]) = return 4 + recursive_sum([5]),**
5. **recursive_sum([5]) = return 5+ recursive_sum([]),**

}

Now lets Complete The Summing
We have Returned 0 From recursive_sum([]);
Son in Number 5 we have return 5+ recursive_sum([]);
As recursive_sum([]) =0
So return 5 + recursive_sum([])= 5+0 =5 that means recursive_sum([5]) return 5;

Then come to No 4 . We have recursive_sum([4, 5])=return 4 + recursive_sum([5])
The result of recursive_sum([5]) is 5 So,
return 4 + recursive_sum([5]) = 4+5 = 9 that means recursive_sum([4, 5]) return 9;

Then come to No.3 We Have recursive_sum([3,4,5]) = return 3 + recursive_sum([4, 5]),
The result of recursive_sum([4, 5]) is 9 So,
return 3 + recursive_sum([4, 5]) = 3+9 = 12, That means recursive_sum([3,4,5]) return 12,

Then come to No.2 We Have recursive_sum([2,3,4,5]) = return 2 + recursive_sum([3, 4, 5]),
The result of recursive_sum([3,4, 5]) is 12 So,
return 2 + recursive_sum([3,4, 5]) = 2+12 = 14, That means recursive_sum([2,3,4,5]) return 12,

Then come to No.1 We Have recursive_sum([1,2,3,4,5]) = return 1 + recursive_sum([2,3, 4, 5]),
The result of recursive_sum([2,3,4, 5]) is 14 So,
return 1 + recursive_sum([2,3,4, 5]) = 1+14 = 15, That means recursive_sum([1,2,3,4,5]) return 15

That's The Result We Get From reccursive_sum([1,2,3,4,5]) is 15;