What a recursive function/method does?

here, summation(int n) is a recursive function.

How does it look like??

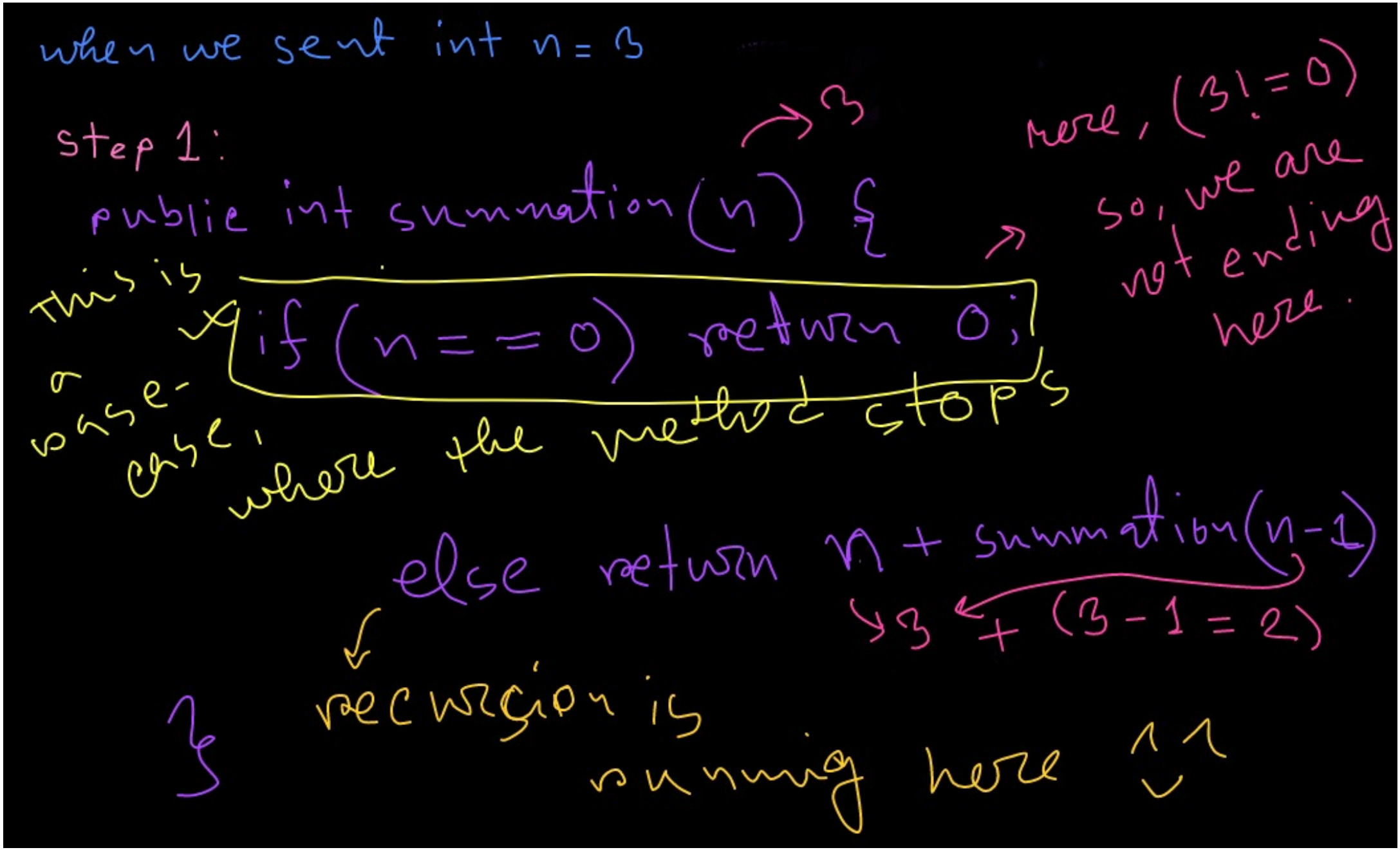
```
public int summation(int n) {
    if (n == 0) return 0;
    else return n + (n - 1);
}
```

This is the function ^1

What is happening in the function?

summation(3);

Here, we are calling the method. "3" is an integer. We are sending "3" to get it's summation till "0" the result will be "6". How? Let's see.....


when we sent int n = 3
step 1:
public int summation(n) {
3
here, (3 != 0)
so, we are not ending here.
This is a base-case; where the method stops
if (n == 0) return 0;
else return n + summation(n-1)
3
+ (3 - 1 = 2)
recursion is running here
}

step 2:

```
public int summation (n) {          n -> 2
    (2 != 0)
    if (n == 0) return 0;

    else return n + summation(n-1)
                2 +            (2-1 = 1)
```

Step 3:

```
public int summation (n) {
    if (n == 0) return 0;
    else return n + summation (n-1);
}
```

(2 != 0)

2 + (2 - 1 = 0)

Step 4:

```
public int summation(n) {
    if (n == 0) return 0;
    else return n + summation(n-1);
}
```

0

Therefore we finish here. not going here

Now the method will go backward.

Step 4 ⟶ Step 3 → Step 2 → Step 1

0 ⟶ 1 + 0 ⟶ 2 + 1 → 3 + 3

finally we get $\boxed{3+3=6}$

the result. ☺