



| | Statement | S/E | Frequency | Total |
|-----------------|------------------------------|-----|-------------------------------------|--------------|
| 1 | int func(int n) { | 0 | - | 0 |
| 2 | int sum=0; | 1 | 1 | 1 |
| 3 | for(int i=n; i> 0; i- -) { | 1 | n+1 | n+1 |
| 4 | for(int j=n-1; j>=i; j- -) { | 1 | $n(n + 1)/2$ | $n(n + 1)/2$ |
| 5 | sum=i+j; | 1 | $n(n - 1)/2$ | $n(n - 1)/2$ |
| 6 | System.out.println(sum); | 1 | $n(n - 1)/2$ | $n(n - 1)/2$ |
| 7 | } | 0 | - | 0 |
| 8 | } | 0 | - | 0 |
| 9 | } | 0 | - | 0 |
| Total Operation | | | $\frac{3}{2}n^2 + \frac{1}{2}n + 2$ | |
| Big-Oh | | | $O(n^2)$ | |

1. This line is not executable, S/E is 0.
2. This line is executable (S/E is 1) and it will be executed once (Frequency = 1)
3. This line is executable (S/E is 1) and it will be executed n+1 times, we applied the rule for the *for* statement initial – max + 1 = n – 0 + 1 = n + 1
4. In this step the inside for depends in I, see the following table:

| i | j (initial) | How many times j >= i | sum=i+j | System.out.println(sum); |
|------|-------------|------------------------------------------|---------|--------------------------|
| n | n-1 | n-1 >= n (1 time) | 0 | 0 |
| n-1 | n-1 | n-1 >= n-1 , n-2 >= n-1 (2 times) | 1 | 1 |
| n-2 | n-1 | n-1 >= n-1 , n-2 >= n-1 (3 times) | 2 | 2 |
| n-3 | n-1 | n-1 >= n-1 , n-2 >= n-1 (4 times) | 3 | 3 |
| | | | | |
| 3 | n-1 | n-1 >= n-1 , n-2 >= n-1 (n-2 times) | n-3 | n-3 |
| 2 | n-1 | n-1 >= n-1 , n-2 >= n-1 (n-1 times) | n-2 | n-2 |
| 1 | n-1 | n-1 >= n-1 , n-2 >= n-1 (n times) | n-1 | n-1 |
| 0 | | | | |

$$\begin{aligned}
 j \geq i &= 1 + 2 + 3 + 4 + \dots + (n-2) + (n-1) + (n) = \sum_{i=1}^n i = \frac{n(n+1)}{2} \\
 \text{sum} &= i+j = 0 + 1 + 2 + 3 + \dots + (n-3) + (n-2) + (n-1) \\
 &= \sum_{i=1}^n i = \frac{n(n+1)}{2} - n = \frac{n^2+n}{2} - n = \frac{n^2+n}{2} - \frac{n}{1} = \frac{n^2+n-2n}{2} = \frac{n^2-n}{2} = \frac{n(n-1)}{2}
 \end{aligned}$$