

1. Lines (1) through (3) and (7) each take 1 time unit. The loop on lines (4) through (6) executes $n - i + 1$ times. But i is given and is 2, thus the loop executes $n - 1$ times. Each instruction, including the condition, takes 1 time unit. But the condition also is executed by one more than how many times the body is executed. Hence the loop takes $3(n - 1) + 1$ time units. Together with the 4 time units spent in the instructions other than the loop, the total time taken by the program is $3n + 2$. Since n is the size of the data the program operates on, then the running time $T(n) = 3n + 2$.

2. Consider Exercise 2.5.1. Line (4) is executed n times taking 1 time unit each. The incrementation on line (3) takes 1 time unit as well and executes n times. The condition on line (3) is executed $n + 1$ times and takes 1 time unit each. Lines (1) and (2) each take 1 time unit. The initialization on line (3) takes 1 time unit. The size of the data is n . Thus we have the running time $T(n) = 3n + 4$.

Consider Fig. 2.14.