Pseudocode for FASTEST-WAY, the dynamic programming solution\(^1\) of the Assembly-Line Scheduling problem, is found on page 329 in the textbook. The pseudocode for the version of the FASTEST-WAY algorithm developed in class is found in Figure 1. Descriptive comments have been added at the top, and the body of the primary for loop (lines 9-16) has been simplified. Array notation has been replaced by mathematical notation with subscripts. And the values returned by the algorithm are explicitly given in the return statement (line 22).

FASTEST-WAY\((a, t, e, x, n)\)

1. $n$ is the number of assembly stations in each assembly line
2. $a_{ij}$, where $i = 1, 2$ and $1 \leq j \leq n$, is the assembly time for station $S_{ij}$
3. $t_{ij}$, where $i = 1, 2$ and $1 \leq j \leq n - 1$, is the switching time from $S_{ij}$ to $S_{3 - i, j}$
4. $e_i$, where $i = 1, 2$, is the entry time for assembly line $i$
5. $x_i$, where $i = 1, 2$, is the exit time for assembly line $i$
6. returns the computed values $f_{ij}$, $f^*$, $l_{ij}$, and $l^*$

7. $f_{1,1} \leftarrow e_1 + a_{1,1}$
8. $f_{2,1} \leftarrow e_2 + a_{2,1}$
9. for $j \leftarrow 2$ to $n$  
   
   do if $f_{i,j-1} \leq f_{r,j-1} + t_{r,j-1}$
   
   then $f_{ij} \leftarrow a_{ij} + f_{i,j-1}$
   
   $l_{ij} \leftarrow i$
10. else $f_{ij} \leftarrow a_{ij} + f_{r,j-1} + t_{r,j-1}$
11. \hspace{1cm} $l_{ij} \leftarrow r$
12. end do
13. \hspace{0.5cm} end if
14. end for
15. for $i \leftarrow 1$ to $2$
16. \hspace{1cm} do
17. \hspace{2cm} if $f_{1n} + x_1 \leq f_{2n} + x_2$
18. \hspace{3cm} then $f^* \leftarrow f_{1n} + x_1$
19. \hspace{3cm} $l^* \leftarrow 1$
20. \hspace{2cm} else $f^* \leftarrow f_{2n} + x_2$
21. \hspace{3cm} $l^* \leftarrow 2$
22. \hspace{1cm} end do
23. end for
24. return $f_{ij}$, $f^*$, $l_{ij}$, $l^*$

Figure 1: The class version of the FASTEST-WAY algorithm for finding the optimal time $f^*$ of an optimal schedule solving an instance of Assembly-Line Scheduling.

\(^1\)Actually, this is the algorithm that computes the optimal values and the back pointers, not the actual optimal schedule.