100. Assembly Line Scheduling Problem

PROGRAM:-

```
def assembly_line(a, t, e, x, n):
    # Initialize DP tables
    T1 = [0] * n
    T2 = [0] * n

    # Base cases
    T1[0] = e[0] + a[0][0]
    T2[0] = e[1] + a[1][0]

    # Fill the DP tables
    for j in range(1, n):
        T1[j] = min(T1[j-1] + a[0][j], T2[j-1] + t[1][j-1] + a[0][j])
        T2[j] = min(T2[j-1] + a[1][j], T1[j-1] + t[0][j-1] + a[1][j])

    # Calculate final result
    result = min(T1[n-1] + x[0], T2[n-1] + x[1])
    return result

# Example usage:
n = 4  # number of stations
a = [[4, 5, 3, 2], [2, 10, 1, 4]]  # time at stations
t = [[0, 7, 4, 5], [0, 9, 2, 8]]  # transfer times
e = [10, 12]  # entry times
x = [18, 7]   # exit times

print(f"The minimum time to complete the assembly is {assembly_line(a, t, e, x, n)}")
```

OUTPUT:-

```
The minimum time to complete the assembly is 36

=== Code Execution Successful ===
```

TIME COMPLEXITY:-O(n)