SINGAPORE INSTITUTE OF TECHNOLOGY

CSD2181/CSD2183

Data Structures

Please write clearly:

Name: _____

Student ID: _____

Homework 1, Exercise 1.4 – Trimester 2, AY2024/25

Instructions to students:

Your answers must fit within the designated boxes. Do not resize them. Gradescope requires your answers to be placed precisely in these locations.

(a) Following the example of Figure 4.1 in the textbook [Cormen et al. (2022); Figure 4.5 in the third edition], sketch the recursion tree for Strassen's algorithm. Clearly indicate the total cost at each level, the number of levels, and the number of leaves at the bottom of the tree.

(15 points)

(b) Based on the recursion tree, derive that the total running time of Strassen's algorithm is $O(n \log_2 7)$.

(10 points)

---END OF EXERCISE 1.4---