Exercise 8. Answer Sheet

Student's Name: Tomonori Masubuchi Student's ID: s1240078

Problem 1. Write pseudo-code for the Strassen's algorithm.

Put your answer heref

```
for i 1 to n
 do for j 1 to n
   do cij 0
     for k 1 to n
       do cij ← cij+aik*bkj
```

Problem 2. Use Strassen's algorithm to compute the matrix product:

$$\begin{pmatrix} 1 & 3 \\ 7 & 5 \end{pmatrix} \begin{pmatrix} 6 & 8 \\ 4 & 2 \end{pmatrix}$$

Show your work below:

C_{11} = P_1 + P_4 - P_5 + P_7 =18
C_{12} = P_3 + P_5=14
C_{21} = P_2 + P_4=62
C_{22} = P_1 + P_3 - P_2 + P_6=66

C=(18 14)
(62 66)

Problem 3. Make two programs implementing the Recursive matrix multiplication and the Strassen's algorithm. Upload your code. Generate two random matrices A and B of size n×n, multiply them using your programs and measure the time needed to get the result. Fill the following table:

Time needed to multiply two n×n matrices. (May depend on the programming language, computer, etc.)

Algorithm	n					
	32	64	128	256	512	1024
Recursive (sec)						

Strassen (sec)						