Assignment 5

Objective: To implement a C/C++ program to multiply two matrices.

Brief Theory: Consider two matrices X and Y of size N x N. The Strassen's method follows formulas as given below.

$$Z = \begin{bmatrix} I & J \\ K & L \end{bmatrix} \qquad X = \begin{bmatrix} A & B \\ C & D \end{bmatrix} \text{ and } \qquad Y = \begin{bmatrix} E & F \\ G & H \end{bmatrix}$$

$$M_1 := (A + C) \times (E + F)$$
$$M_2 := (B + D) \times (G + H)$$
$$M_3 := (A - D) \times (E + H)$$
$$M_4 := A \times (F - H)$$
$$M_5 := (C + D) \times (E)$$
$$M_6 := (A + B) \times (H)$$
$$M_7 := D \times (G - E)$$

then

$$I := M_2 + M_3 - M_6 - M_7$$
$$J := M_4 + M_6$$
$$K := M_5 + M_7$$
$$L := M_1 - M_3 - M_4 - M_5$$

Task: Write a program using the above Strassen's method.

Apparatus and components required: Computer with C or C++ Compiler and Windows operating platform.

Experimental/numerical procedure: Coding, compilation, editing, run and debugging.