Instructions: For each part of this Lab, use Maple to carry out the indicated matrix operations.

Let $A = \begin{bmatrix} -3 & 2 & 1 \\ 2 & -1 & 4 \\ 3 & 1 & 1 \end{bmatrix}$, $B = \begin{bmatrix} 0 & -1 & 2 \\ 2 & 3 & -4 \\ 1 & -1 & 0 \end{bmatrix}$, $C = \begin{bmatrix} 2 & -1 \\ 3 & 5 \\ 0 & 4 \end{bmatrix}$

$D = \begin{bmatrix} 1 & -2 & 3 \\ 4 & 0 & 6 \end{bmatrix}$, $E = \begin{bmatrix} 4 \\ -1 \\ 5 \end{bmatrix}$, $F = \begin{bmatrix} -2 \\ 0 \\ 3 \end{bmatrix}$.

1. Define each of the matrices given above using whichever Maple input method you prefer.
2. Compute each of the following, or state that they are not possible.

   (a) $A + B$ (e) $3A - 4B$ (i) $B(E + F)$
   (b) $C + D$ (f) AB (j) $BE + F$
   (c) $E + F$ (g) BA (k) CD
   (d) $3C$ (h) $BE + BF$ (l) DC

3. Compute each of the following or state that they are not possible.

   (a) A^T (e) $D^T + C$ (i) $A^{-1}B^{-1}$
   (b) $(A + B)^T$ (f) A^{-1} (j) $B^{-1}A^{-1}$
   (c) $A^T + B^T$ (g) B^{-1} (k) AA^{-1}
   (d) $C^T + D$ (h) $(AB)^{-1}$ (l) $B^{-1}B$

4. Use Maple to list the following matrix entries:

   (a) $A_{2,1}$ (b) $A_{1,2}$ (c) $B_{2,3}$ (d) $D_{1,2}$

5. Use Matrices to solve the following system of equations:

$$\begin{aligned} 1x_1 - 3x_2 + 2x_3 + 0x_4 + 1x_5 &= -2 \\ 2x_1 - 1x_2 + 0x_3 + 4x_4 + 0x_5 &= 1 \\ 3x_1 - 1x_2 + 0x_3 - 3x_4 + 2x_5 &= 0 \\ 1x_1 - 2x_2 + 3x_3 + 1x_4 + 0x_5 &= 2 \\ 0x_1 + 2x_2 - 3x_3 + 0x_4 + 1x_5 &= 1 \end{aligned}$$