

## Exercises on multiplication and inverse matrices

**Problem 3.1:** Add  $AB$  to  $AC$  and compare with  $A(B + C)$  :

$$A = \begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix} \quad B = \begin{bmatrix} 1 & 0 \\ 0 & 0 \end{bmatrix} \quad C = \begin{bmatrix} 0 & 0 \\ 5 & 6 \end{bmatrix}$$

$$AB + AC = A(B+C)$$

**Problem 3.2:** (2.5 #24. *Introduction to Linear Algebra: Strang*) Use Gauss-Jordan elimination on  $[U \ I]$  to find the upper triangular  $U^{-1}$  :

$$UU^{-1} = I \quad \begin{bmatrix} 1 & a & b \\ 0 & 1 & c \\ 0 & 0 & 1 \end{bmatrix} \begin{bmatrix} x_1 & x_2 & x_3 \end{bmatrix} = \begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{bmatrix}.$$

$$\begin{array}{l} 1 \ -a \ ac-b \\ 0 \ -1 \ c \\ 0 \ 0 \ 1 \end{array}$$

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