

Write a computer program to solve the least square problem for an overdetermined system  $Ax = b$ , where  $A \in \mathbb{R}^{m \times n}$ ,  $m > n$ , assuming that  $A$  has full rank. Use the reduced QR decomposition. Use all “numerical hints” discussed in class.

Apply your program to solve the system of equations:

$$\begin{bmatrix} 1 & 2 & 3 & 4 \\ 5 & 6 & 7 & 8 \\ 9 & 10 & 11 & 12 \\ 1 & 1 & 1 & 1 \\ 3 & 2 & 1 & 0 \end{bmatrix} \times \begin{bmatrix} x_1 \\ x_2 \\ x_3 \\ x_4 \end{bmatrix} = \begin{bmatrix} 10 \\ 26 \\ 42 \\ 4 \\ 6 \end{bmatrix}$$