1. Establish the relations shown at the top of Page 16-17 of Lecture notes # 16. [Hint: use the relation $A = \sum_{i=1}^{r} \sigma_i u_i v_i^T$ from previous page]

2. Compute the nonzero singular values of the matrix

$$A = \begin{bmatrix} 1 & 0 & 1 & 2 \\ -1 & 1 & 1 & 1 \end{bmatrix}$$

Check your result using matlab. What are the nonzero singular values of A^T ?