

### 1.27 Pop quiz on Lecture 27 material

1. Compute the singular value decomposition of  $A = \begin{pmatrix} 1 & 0 & 1 \\ 0 & 1 & 0 \end{pmatrix}$ . More precisely, find a  $2 \times 2$  orthogonal matrix  $U$ , a  $2 \times 3$  ‘diagonal’ matrix  $S$ , and a  $3 \times 3$  orthogonal matrix  $V$ , such that  $A = USV^T$ .
2. Compute the singular value decomposition of  $A = \begin{pmatrix} 0 & -1 \\ 0 & 0 \end{pmatrix}$ . More precisely, find a  $2 \times 2$  orthogonal matrix  $U$ , a  $2 \times 2$  diagonal matrix  $S$ , and a  $2 \times 2$  orthogonal matrix  $V$ , such that  $A = USV^T$ .