1. Let \( \mathbf{u}_1 = (1, 1, 1, 0)^T \) and \( \mathbf{u}_2 = (0, 1, 1, 1)^T \). Let \( U = \text{Span}(\mathbf{u}_1, \mathbf{u}_2) \). Find a basis for \( U^\perp \).

2. Find the linear function that best approximates data

\[
\begin{array}{c|cccc}
  x & -2 & 0 & 1 & 2 \\
  y & 2 & 0 & 1 & 2 \\
\end{array}
\]

in the least squares sense.