B] Se observa que $B = B^T = \begin{bmatrix} 2 & 0 & 0 & 0 \\ 0 & 1 & 1 & 0 \\ 0 & 1 & 1 & 0 \\ 0 & 0 & 0 & 2 \end{bmatrix}$.

$\Rightarrow$ B es simétrico $\Rightarrow$ B es diagonalizable.

$$\det(A - \lambda I) = \det \begin{vmatrix} 2-\lambda & 0 & 0 & 0 \\ 0 & 1-\lambda & 1 & 0 \\ 0 & 1 & 1-\lambda & 0 \\ 0 & 0 & 0 & 2-\lambda \end{vmatrix} = \cancel{(1-\lambda)^2 (2-\lambda)^2}$$

$$= (2-\lambda)\left[(1-\lambda)^2(2-\lambda) - (2-\lambda)\right] = (2-\lambda)^2\left[(1-\lambda)^2 - 1\right].$$

$\Rightarrow \lambda_1 = 2$ mult alg $= 3$.
$\lambda_2 = 0$ mult alg $= 1$.

$\underline{\lambda_1 = 2}$.

$$\begin{bmatrix} 0 & 0 & 0 & 0 \\ 0 & -1 & 1 & 0 \\ 0 & 1 & -1 & 0 \\ 0 & 0 & 0 & 0 \end{bmatrix} \begin{pmatrix} v_1 \\ v_2 \\ v_3 \\ v_4 \end{pmatrix} = \begin{pmatrix} 0 \\ 0 \\ 0 \\ 0 \end{pmatrix} \longrightarrow \begin{matrix} 0 = 0 \\ v_2 = v_3 \\ v_2 = v_3. \\ 0 = 0 \end{matrix}$$