Step-1

Let matrix A has Eigen values 0 and 1. Corresponding to these Eigen values Eigen vectors are as follows:

$$\begin{bmatrix} 1 \\ 2 \end{bmatrix}, \begin{bmatrix} 2 \\ -1 \end{bmatrix}$$

Compute the Eigen values and Eigen vectors of A^2. Determine the relation of A^2 to A.

Step-2

Recall that the Eigen values of A^2 are exactly $\lambda_1^2, \lambda_2^2, \ldots, \lambda_n^2$, and every Eigen vector of A is also an Eigen vector of A^2.

So, Eigen value of A^2 will be 0 and 1, and Eigen vectors will be as follows:

$$\begin{bmatrix} 1 \\ 2 \end{bmatrix}, \begin{bmatrix} 2 \\ -1 \end{bmatrix}$$

Step-3

Start from the following equation:

$$Ax = \lambda x$$
$$A \cdot Ax = A\lambda x$$
$$A^2 x = \lambda(Ax)$$
$$A^2 x = \lambda(\lambda x)$$

Therefore, $\boxed{A^2 x = \lambda^2 x}$.