Step-1

Consider the following:

$$\begin{aligned} Bx &= \mu x \\ (I - A)x &= \mu x \\ Ix - Ax &= \mu x \end{aligned}$$

$$\begin{aligned} x - \lambda x &= \mu x \\ (1 - \lambda)x &= \mu x \end{aligned}$$

Thus, $1 - \lambda = \mu$. Therefore, eigenvalue of B is $\boxed{1 - \lambda}$.

Step-2

Suppose the absolute value of eigenvalue of B is less than 1.

Thus, we have $|1 - \lambda| < 1$.

This is same as $|\lambda - 1| < 1$

Step-3

We know the following property of the absolute value function:

$|x| < a \Rightarrow -a < x < a$

By using the above property, we get

$$\begin{aligned} |\lambda - 1| &< 1 \\ -1 < \lambda - 1 &< 1 \end{aligned}$$

Adding 1 through the inequality, we get

$0 < \lambda < 2$

Step-4

Thus, if the absolute value of eigenvalue of B is less than 1, the absolute value of the eigenvalue of A must lie between $\boxed{0 \text{ and } 2}$.