Step-1

Let λ be an eigenvalue of the matrix *A* and *x* be the respective eigenvector of *A*.

Then we have $Ax = \lambda x$ â€¦â€¦ (1)

We have to show that $|\lambda| \le \|A\|$

Step-2

By the definition of the norm of a matrix whether symmetric or not, we have $\|A\| = \max \frac{\|Ax\|}{\|x\|}$

$\Rightarrow \|A\| \ge \frac{\|Ax\|}{\|x\|}$

$\Rightarrow \|A\| \ge \frac{\|\lambda x\|}{\|x\|}$ (Since by (1))

Since λ is a scalar, we follow that $\|\lambda x\| = |\lambda| \|x\|$

Using this in the above inequality, we get $\|A\| \ge \frac{|\lambda| \|x\|}{\|x\|}$

$\Rightarrow |\lambda| \le \|A\|$

Hence $\boxed{|\lambda| \le \|A\|}$, where λ is an eigenvalue of *A*.