A selfadjoint operator $T \neq 0$ on a Hilbert space such that T is neither positive nor negative.

****

Consider $T = \begin{pmatrix} -1 & 0 \\ 0 & 1 \end{pmatrix}$ belonging to $B(\mathcal{C}^2), \xi = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$ and $\eta = \begin{pmatrix} 0 \\ 1 \end{pmatrix}$. Then $< T\xi, \xi >= -1$ and $< T\eta, \eta >= 1$. Hence the selfadjoint operator T is neither positive nor negative.