Exercise 5.8. [1ZZ] *Consider the ring of matrixes* $\mathbb{R}^{2\times 2}$ *let's define*

$$A = \begin{pmatrix} 0 & 1 \\ 1 & 0 \end{pmatrix} \quad , \quad B = \begin{pmatrix} 0 & 1 \\ 0 & 0 \end{pmatrix} \quad ,$$

then check that

$$AB = \begin{pmatrix} 0 & 0 \\ 0 & 1 \end{pmatrix} \quad , \quad BA = \begin{pmatrix} 1 & 0 \\ 0 & 0 \end{pmatrix} \quad ;$$

you conclude that the ring of matrixes is not commutative.