1. Show that for any matrix \( A \in \mathbb{R}^{m \times n} \) \((n > m)\) there is a nonzero vector \( x \in \mathbb{R}^n \) such that \( Ax = 0 \).
2. Show that all the elements of \(\{0, 1\}^n\) (Binary strings) may be ordered such that every successive strings in this order are different only in one character.

For example, for \(n = 2\) the order may be 00, 01, 11, 10.