ECE 712: Matrix Computations for Signal Processing
mini Assignment 2

Due: Tues Sept 23

Consider any tall matrix $\mathbf{A} \in \mathbb{R}^{m \times n}$, which may be rank deficient, and a corresponding vector $\mathbf{b} \in \mathbb{R}^m$.

- Under what condition(s) does an exact solution $\mathbf{x}$ exist for the system of equations $\mathbf{A}\mathbf{x} = \mathbf{b}$?
- Develop a complete description for the solution $\mathbf{x}$.

Hint: Consider $R(\mathbf{A})$ and $N(\mathbf{A})$.