Written Assignment 9: Due Wednesday, November 26

**Problem 1:** Let $U$ and $W$ be subspaces of $\mathbb{R}^6$ with $\dim(U) = 4$ and $\dim(W) = 3$. Show that $U \cap W \neq \{\vec{0}\}$

* Hint: Start by fixing bases of $U$ and $W$. A previous homework problem will be helpful.

**Problem 2:** Let $V$ and $W$ be vector spaces. Suppose that $T: V \rightarrow W$ is an injective linear transformation and that $(\vec{u}_1, \vec{u}_2, \ldots, \vec{u}_n)$ is a linearly independent sequence in $V$. Show that $(T(\vec{u}_1), T(\vec{u}_2), \ldots, T(\vec{u}_n))$ is a linearly independent sequence in $W$. 