Math 170A Assignment # 7

Instructor: Jiawang Nie

Due Date: December 1, 2014

1. Exercise 3.2.48.

2. Write your own Matlab code to compute QR factorization with:

   Input: A matrix $A \in \mathbb{R}^{m\times n}$ with $m \geq n$.

   Output: An orthorgonal matrix $Q \in \mathbb{R}^{m\times m}$ and an upper triangular $R \in \mathbb{R}^{m\times n}$ such that $A = QR$.

   Look at iteration formula in (3.2.43). Test your code on matrices generated by `randn(m,n)` in Matlab.

3. Exercise 3.3.10.

4. Write your own Matlab code to implement the Gram-Schmidt process with:

   Input: A matrix $A \in \mathbb{R}^{m\times n}$ with $m \geq n$.

   Output: An isometric matrix $Q \in \mathbb{R}^{m\times n}$ and an upper triangular $R \in \mathbb{R}^{n\times n}$, such that $A = QR$ and the diagonal entries of R are nonnegative.

   Look at iteration formula in (3.4.19). Test your code on matrices generated by `randn(m,n)` in Matlab.