1. **Instructional Accounts** Get your instructional accounts from http://inst.eecs.berkeley.edu/webacct

2. **Ice-Breaker**

   Welcome back!

3. **Who will win the election?** Candidates A, B, C are running for office. Currently, B is leading with 90% and A and C split the rest of the votes. However, the public's opinions change every day: 10% of A's supporters will revert to B; 20% and 10% of B's supporters will switch to favoring A and C, respectively; and 20% of C's supporters will switch to supporting A and another 20% will go for B.

   (a) How could we model this using the linear-algebraic tools that you have learned?

   (b) Given that the final election is very far from now, who will win this election assuming supporters keep changing in the described way?

4. **Eigenspace** Suppose $\lambda_1, \cdots, \lambda_m$ are distinct eigenvalues of T and $\vec{v}_1, \cdots, \vec{v}_m$ are corresponding eigenvectors. Show that $\vec{v}_1, \cdots, \vec{v}_m$ are linearly independent.

5. **Inner Product, Projection**

   Suppose that we have a vector $\vec{v}$ that we wish to approximate. We are given a collection of k vectors $\vec{u}_1, \vec{u}_2, \ldots, \vec{u}_k$. We would like to find an approximation $\vec{w}$ to $\vec{v}$ where we require that $\vec{w}$ is a linear combination of the k vectors $\vec{u}_i$. Assume that you care about minimizing the Euclidean distance between $\vec{w}$ and $\vec{v}$.

   How would you find $\vec{w}$ and why does this work?