

Computer Science 2830  
Assignment 12  
due December 11, 2008

1. Do problem 8 on page 400.
2. Suppose  $W$  is a subspace of  $\mathbb{R}^n$  of dimension  $k$ , and suppose  $U$  is an  $n \times k$  matrix whose columns are an **orthonormal** basis for  $W$ . Let  $P = UU^T$ 
  - a) What are the eigenvalues of  $P$  and their multiplicities? (Hint: Don't look at the characteristic equation; look at vectors in  $W$  and its orthogonal complement.)
  - b) Does  $P$  have  $n$  linear independent eigenvectors? Justify your answer.