18.06 - Spring 2005 - Problem Set 8

This problem set is due Wednesday (April 20th), at 4 PM, in 2-106. Make sure to write your **name, recitation number and instructor** on your homework!

Lecture 25:

- **Read:** book section 6.4
- **Work:** book section 6.4 (exercises 1, 9, 10, 18, 23, 24, 26 and 29).

Lecture 26:

- **Read:** book section 6.5.
- **Work:** book section 6.5 (exercises 4, 6, 14, 20, 22, 28, 30 and 32).

Challenge Problem: Consider the 3×3 matrix

$$A = \begin{pmatrix} a & b & c \\ 1 & d & e \\ 0 & 1 & f \end{pmatrix}$$

Determine the entries a, b, c, d, e, f so that:

- the top left 1×1 block is a matrix with eigenvalue 2;
- the top left 2×2 block is a matrix with eigenvalues 3 and -3;
- the top left 3×3 block is a matrix with eigenvalues 0, 1 and -2.