

## 18.085 MATLAB 2.2

Due WED Oct 10

This is about  $Mu'' + Ku = 0$  with  $M = \begin{bmatrix} 1 & 0 \\ 0 & 4 \end{bmatrix}$  and  $K = \begin{bmatrix} 4 & -4 \\ -4 & 16 \end{bmatrix}$ .

1. Find the eigenvalues  $\lambda_1, \lambda_2$  and eigenvectors  $x_1, x_2$  of  $M^{-1}K$  by `eig(K,M)` and check that  $x_1^T M x_2 = 0$ . They solve  $Kx = \lambda Mx$ .
2. Use the `normalmodescode` to solve  $Mu'' + Ku = 0$  starting from  $u = (1, 0)$  and  $u' = (0, 0)$ . Find the solution vector  $u$  at  $t = 1$  and  $t = 2$ .