1. Use the Bisection Method to find the root to five correct decimal places. Compare with `fzero`. Graph should be drawn.

$$\cos^2 x + 6 = x$$

2. Use Newton's Method to approximate the root to five correct decimal places. Compare with `fzero`. Graph should be drawn.

$$\ln x + x^2 = 3$$

3. Let H denote the $n \times n$ Hilbert matrix, whose (i, j) entry is $1/(i + j - 1)$. Use the Matlab program to solve $Hx = b$, where b is the vector of all ones, for $n = 5$. Determine characteristic polynomial, eigenvalues and eigenvectors for the matrix.

4. Fit the monthly data for Japan 2003 oil consumption, shown in the following table, with polynomials of degree $1 - 10$, and calculate the RMSE. Show graphs in a figure with 2 rows and 5 columns. Use $1 - 12$ for the months.

month	oil use (106 bbl/day)
Jan	6.224
Feb	6.665
Mar	6.241
Apr	5.302
May	5.073
Jun	5.127
Jul	4.994
Aug	5.012
Sep	5.108
Oct	5.377
Nov	5.510
Dec	6.372

5. Use a Matlab code to plot the surface with contours over the given rectangle.

$$f(x, y) = \cos(x)\cos(y)e^{-\sqrt{x^2+y^2}/4}, \quad -2\pi \leq x, y \leq 2\pi.$$

Best wishes
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