ex. 5.3

Consider again $X^2 - A = 0$

and the Denman-Beavers method (1976):

$$\begin{cases} X_{k+1} = \frac{1}{2}\left(X_k + Y_k^{-1}\right) \\ Y_{k+1} = \frac{1}{2}\left(Y_k + X_k^{-1}\right) \end{cases} \quad \} \; k = 0, 1, 2, \ldots$$

with $\begin{cases} X_0 = A \\ Y_0 = I \end{cases}$.

a) write a Matlab file DB.m
that peforms the Denman-Beavers iterations.

b) test your code for the matrix:

$$A = \begin{pmatrix} 10 & 7 & 8 & 7 \\ 7 & 5 & 6 & 5 \\ 8 & 6 & 10 & 9 \\ 7 & 5 & 9 & 10 \end{pmatrix}$$

Compare with matrix-Newton*.

* Use 20 iteration steps.