Matrix Operations

1. Try the following commands (at the prompt and then press [Enter]):
   - clear
   - \( M = \begin{bmatrix} 1,3,-1,6;2,4,0,-1;0,-2,3,-1;-1,2,-5,1 \end{bmatrix} \)
   - \( \text{det}(M) \)
   - \( \text{inv}(M) \)

2. Repeat the above procedure for the matrix:
   \[
   N = \begin{bmatrix} -1 & -3 & 3 \\ 2 & -1 & 6 \\ 1 & 4 & -1 \\ 2 & -1 & 2 \end{bmatrix}
   \]

3. Multiply \( M \) and \( N \) using \( M * N \). Can the order of multiplication be switched? Why or why not? Try it to see how MATLAB reacts.

4. Find the determinant and inverse of the following matrix:
   \[
   A = \begin{bmatrix} 1.2969 & .8648 \\ .2161 & .1441 \end{bmatrix}
   \]

5. Let \( B \) be the matrix obtained from \( A \) by rounding off to three decimal places. Find the determinant and inverse of \( B \). How do \( A^{-1} \) and \( B^{-1} \) differ? Explain how this happened.

6. Prepare a brief (< 1 page) written report describing what happened and answering all the questions. Writing quality will play a part in your grade.

This exercise introduces some basic matrix operations, the importance of matrix dimensions, and numerical sensitivity.

---

Copyright ©2002 Steve Chapin and Todd Young. All rights reserved. Please address comments to young@math.ohiou.edu.