Matlab commands for the virtual fields method training session

Create a (2 by 2) matrix A:
A(1,1)=1;
A(1,2)=2;
A(2,1)=3;
A(2,2)=4;
will give you: $A = \begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}$

Sum of the terms of matrix A:
sum(A)
will produce the following line vector (4,6)
sum(sum(A)) will produce 10 (sum of all terms).

If the matrix contains NaNs:
sum(A(find(~isnan(A))))
will provide the sum of the non NaN values.

Average of the terms of matrix A:
mean(A)
will produce the following line vector (2,3)
mean(mean(A)) will produce 2.5.

If the matrix contains NaNs:
mean(A(find(~isnan(A))))
will provide the average of the non NaN values.

Inverse and determinant of matrix A:
inv(A)

det(A)

Creation of a matrix of coordinates:
Let x vary between x_1 and x_2 with a pitch of p_x and y between y_1 and y_2 with a pitch of p_y
The first step is two create two vectors of the coordinates of the centres of the elements:
$X= x_1+p_x/2:p_x: x_2-p_x/2$
$Y= y_1+p_y/2:p_y: y_2-p_y/2$
Then, a matrix of coordinates is obtained using:
[X,Y]=meshgrid(X,Y)

Matrix manipulation
B = flipud(A) returns A with rows flipped in the up-down direction, that is, about a horizontal axis
B = fliplr(A) returns A with columns flipped in the left-right direction, that is, about a vertical axis.
Multiply matrices element by element:
A.*A. will give you:

will give you: $A = \begin{bmatrix} 1 & 4 \\ 9 & 16 \end{bmatrix}$

Miscellaneous

[m,n] = size(X) gives the size of the array