MATRIX OPERATIONS USING MICROSOFT EXCEL

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Matrix Operation in Excel

To make Matrix operations in Excel you must have in mind that:

- Instead of using the ENTER (Return) key, you have to use the **CTRL-Shift-ENTER** keys simultaneously. Excel uses this command to know that we are making MATRIX operations.

- List of Commands:

|	MATRIX OPERATION		
	Multiplication	*Determinant*	*Inverse*
Command	+mmult(array1..array2)	+mdeterm(array)	+minverse(array)
Then…..	*CTRL-Shift-ENTER*	*CTRL-Shift-ENTER*	*CTRL-Shift-ENTER*

* Matrix Multiplication

Step 1. Set up the matrices: Suppose we have 2 matrices: A and B. We typed them in an excel worksheet as it's shown in Picture 1.

Picture 1: Defining Matrices A & B
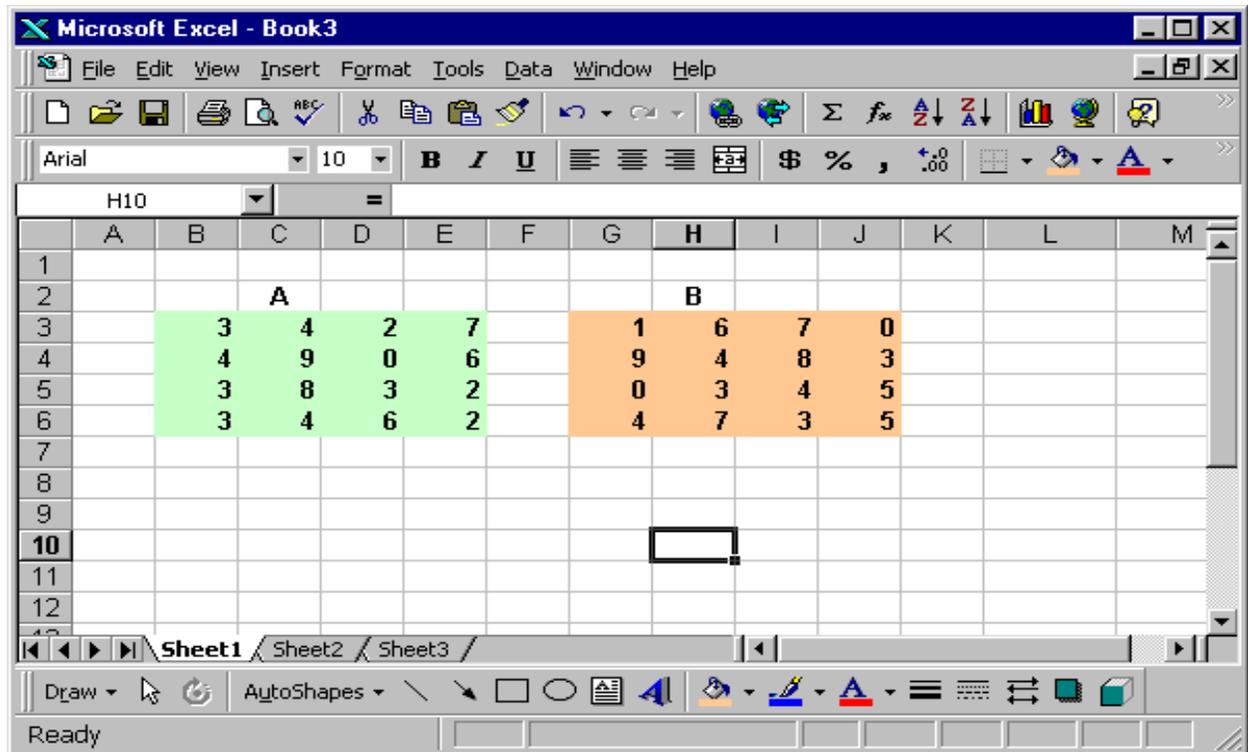
Step 2. We want to Multiply A*B, then with the mouse (or keyboard) "paint" the cells where the A*B matrix will be placed. (Note that you must know the dimension of the new matrix). In our example the A*B matrix will be 4*4 (since A is 4*4 and B is also 4*4), then we "paint" with the mouse a 4*4 matrix as shown in the picture 2.

Picture2.
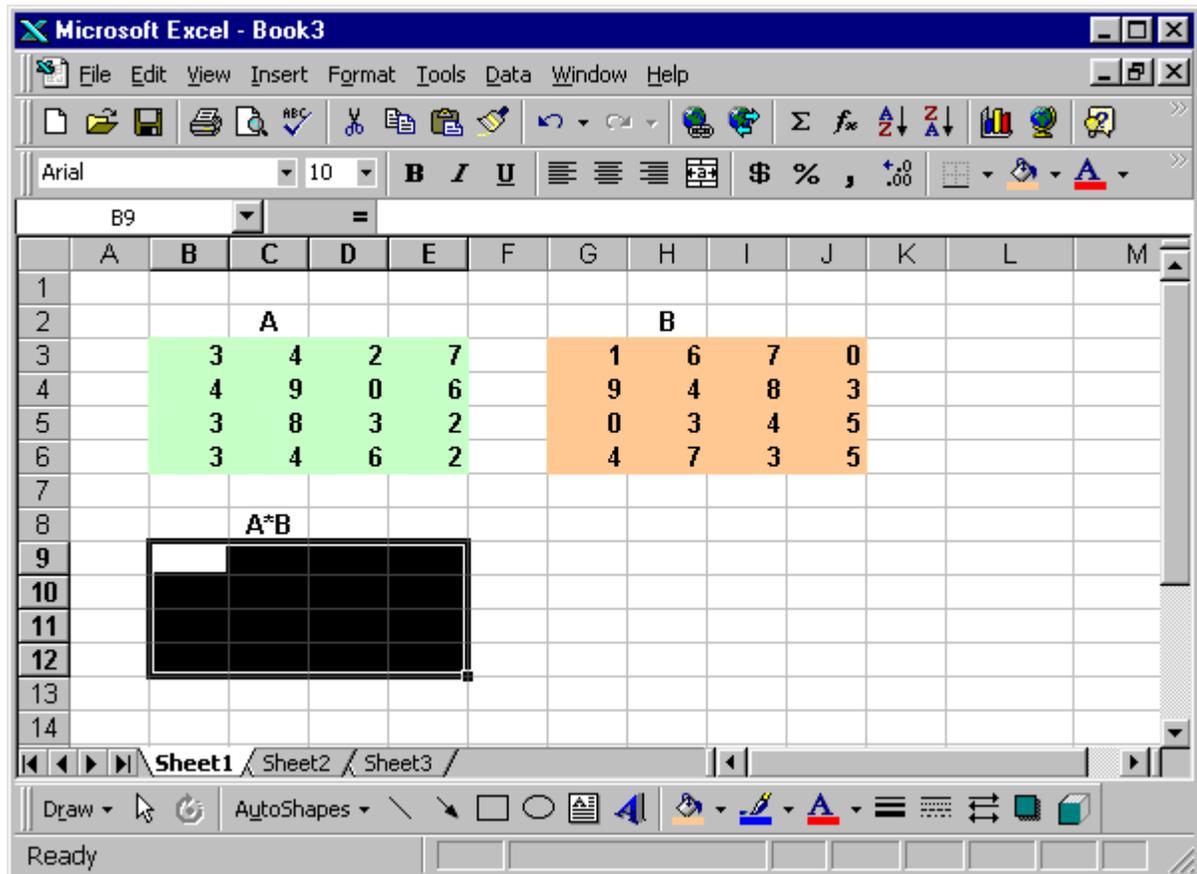
In this case our new matrix (A*B) will be in the cells : B9..E12.

Step 3. Now, we can type the command for the inverse:

To do this, first write **+mmult(**

Then we can "paint" (select the matrix A). Picture 3 illustrates this step.

Picture 3. We can see that the cells for matrix (A*B) is selected and we started typing the command, at this point we typed: **+mmult(** and using the mouse or the keyboard we have painted (selected) the matrix A.

Step 4. Now, type a "comma" (**,**) and go to paint (select) matrix B, (After that, close parenthesis). See Picture 4.

Picture 4.

Step 5. The last step, is the most important: Press **CTRL-SHIFT-ENTER**, and there you will have you're A*B Matrix.

	A			
3	4	2	7	
4	9	0	6	
3	8	3	2	
3	4	6	2	

	B			
1	6	7	0	
9	4	8	3	
0	3	4	5	
4	7	3	5	

	A*B		
67	89	82	57
109	102	118	57
83	73	103	49
47	66	83	52

Matrix Inversion

Step 1. Let's suppose that we want to invert matrix A, defined in picture 1., The first thing to do is to "paint" (select) the cells for the inverse output, as shown in following picture.

Step 2. Type the command to invert the matrix: **+minverse(…..)**
You can use the mouse or keyboard to select the matrix.

Step 3. Just press **CTRL-SHIFT-ENTER** and you will get you're **A⁻¹**
Note: It's not necessary to close the parenthesis.

	A					B			
3	4	2	7		1	6	7	0
4	9	0	6		9	4	8	3
3	8	3	2		0	3	4	5
3	4	6	2		4	7	3	5

A⁻¹

-1.05	1.368	-1.59	1.142
0.194	-0.29	0.516	-0.32
0.258	-0.39	0.355	-0.1
0.406	-0.31	0.284	-0.28

Determinant of a Matrix

Step 1. To get the determinant of a matrix simply locate the cursor in any cell, (the determinant is only one value, then it uses one cell).

Step 2. Type the command and select the matrix.
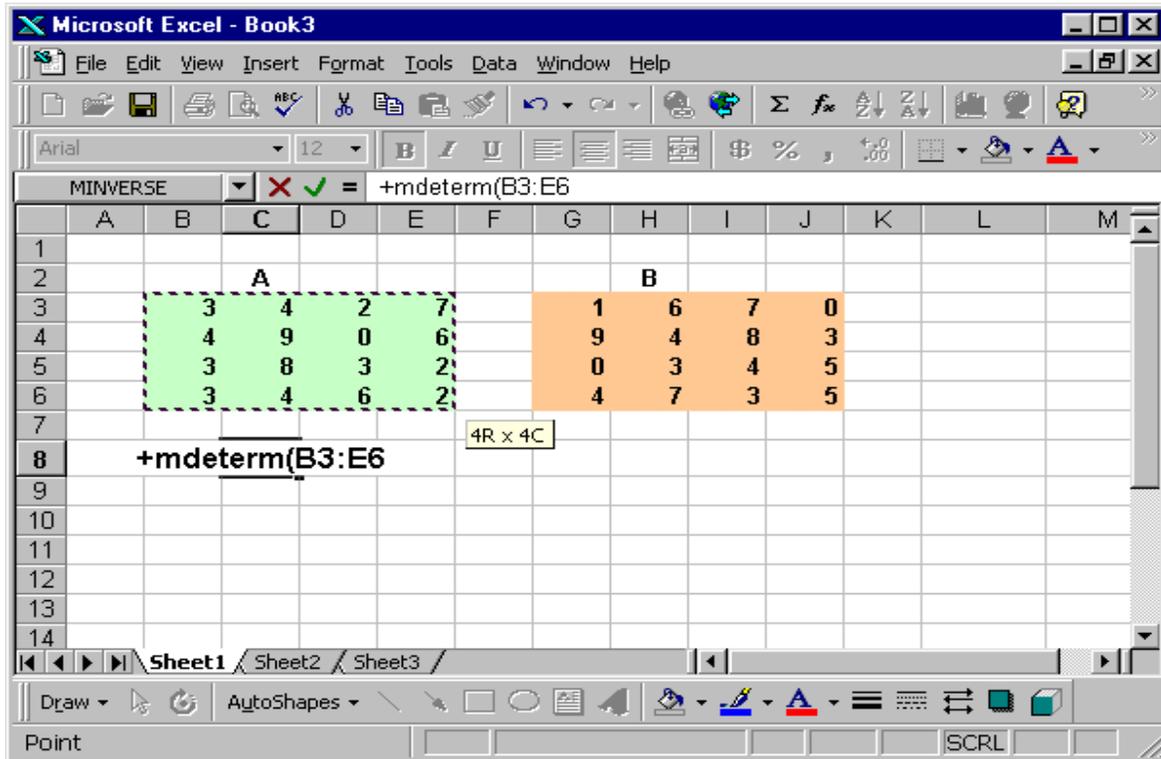
Step 3.. Press **CTRL-SHIFT-ENTER.** You will have the determinant.
Note: it's not necessary to close the parenthesis.