

Program 10

More Arrays

Name: _____ Time spent: _____ min

Create a function to multiply two 2-d arrays. The arrays do not have to be the same size but they must conform to the array multiplication requirements attached. Appropriate use of functions is required (4?)

Test using the arrays in the example.

100 pts

Provide **flow diagram**, **code**, and **results** to prove each function

```
Programming_Project.exe [C/C++ Application] [pid: 19]

Program 10 - 2-D Array Multiplier
Created by Dr. Johnson

Please enter your array dimensions, R1, C1, R2, C2: 3 2 2 4
Enter values for array 1
Please enter row 0 of the array: 1 2
Please enter row 1 of the array: 3 4
Please enter row 2 of the array: 5 6
Enter values for array 2
Please enter row 0 of the array: 1 2 3 4
Please enter row 1 of the array: 5 6 7 8
array 1
1      2
3      4
5      6
array 2
1      2      3      4
5      6      7      8
array 1 X array 2
11     14     17     20
23     30     37     44
35     46     57     68
```

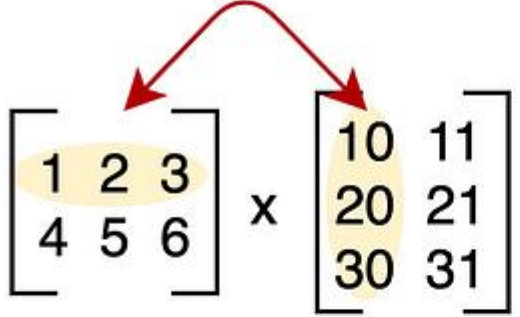
Note: test for valid dimensions

```
Please enter your array dimensions, R1, C1, R2, C2: 2 3 4 2
Your dimensions are not allowed: C1 must equal R2
Please enter your array dimensions, R1, C1, R2, C2: 3 2 2 5
Enter values for array 1
Please enter row 0 of the array: 1 2
Please enter row 1 of the array: 3 4
Please enter row 2 of the array: 5 6
Enter values for array 2
Please enter row 0 of the array: 1 2 3 4 5
Please enter row 1 of the array: 6 7 8 9 10
array 1
1      2
3      4
5      6
array 2
1      2      3      4      5
6      7      8      9      10
array 1 X array 2
13     16     19     22     25
27     34     41     48     55
41     52     63     74     85

Please enter your array dimensions, R1, C1, R2, C2:
```

Matrix (array) multiplication example

cols of matrix 1 must equal the # rows of matrix 2


$$\begin{bmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \end{bmatrix} \times \begin{bmatrix} 10 & 11 \\ 20 & 21 \\ 30 & 31 \end{bmatrix}$$
$$= \begin{bmatrix} 1 \times 10 + 2 \times 20 + 3 \times 30 & 1 \times 11 + 2 \times 21 + 3 \times 31 \\ 4 \times 10 + 5 \times 20 + 6 \times 30 & 4 \times 11 + 5 \times 21 + 6 \times 31 \end{bmatrix}$$
$$= \begin{bmatrix} 10+40+90 & 11+42+93 \\ 40+100+180 & 44+105+186 \end{bmatrix} = \begin{bmatrix} 140 & 146 \\ 320 & 335 \end{bmatrix}$$

Src: towarddatascience.com