

## Assignment 5: arrays

A logical matrix is a matrix which all its elements are either 0 or 1. We define logical multiplication of matrices A and B by the operation defined below, where "." is the logical AND operation, and "+" is the logical OR operation.

$$c[i][j] = \sum_{k=0}^{SIZE-1} a[i][k] \cdot b[k][j]$$

1. Write a function that gets a matrix reference, number of rows and number of columns and reads the input to the matrix from the user. Assume the input is one line with sufficient number of integers separated by a single space. If an integer is none zero replace it by 1.  
Function signature: void read\_mat(int mat[][], int rows, int col)
2. Write a function that "multiplies", as defined above, two matrices and enters the results into a third matrix with suitable dimensions.  
Function signature: void mult\_mat(int mat1[][], int mat2[][], int result\_mat[][], int rows1, int col1, int col2)
3. Write a function which prints a matrix into screen.  
Function signature: void print\_mat(int mat[][], int rows, int col)
4. Write the main program which uses the functions above. It first asks the user to enter the dimensions of the 2 matrices. If the dimensions are invalid (i.e. no match between the first matrix columns to second matrix rows) the program will inform the user and ask for new dimensions. Then, the program reads the matrices values, multiplies them and prints the resulting matrix.

Running example (program in **blue**, user in **red**):

Please enter first matrix dimensions: **2 6**

Please enter second matrix dimensions: **7 5**

Wrong dimensions – first matrix columns number should be same as second matrix rows number

Please enter first matrix dimensions: **2 3**

Please enter second matrix dimensions: **3 4**

Please enter first matrix values: **1 0 0 1 0 1**

Please enter second matrix values: **4 4 6 0 0 1 0 1 0 0 0 9**

First matrix (2, 3):

1 0 0

1 0 1

Second matrix (3, 4):

1 1 1 0

0 1 0 1

0 0 0 1

Multiplication (2, 4):

1 1 1 0

1 1 1 1