Homework 12

Write a program which multiplies two matrices together; it should:

1. read in a file containing

```
qty rows
qty columns
a11 a12 a13 ... a1c
a21 a22 a23 ... a2c
...
ar1 ar2 ar3 ... arc
qty rows
qty columns
b11 b12 b13 ... b1c
b21 b22 b23 ... b2c
...
br1 br2 br3 ... brc
```

   Thereby specifying an A and a B matrix. The result is $C = A \times B$. ($c_{ij} = \sum_{k=1}^{k=c_a} a_{ik} b_{kj}$, where c_a is the quantity of columns in A). Note that c_a (columns in A) should equal r_b (rows in B).

2. Have a separate thread handle the each row of C; thus there should be r_a threads (ie. use `pthread_create`)

3. When the computation is complete (ie. use `pthread_join`), display the result as a matrix:

```
c11 c12 ... c1c
...
cr1 cr2 ... crc
```

Hint:

1. The following code snippet should help (it assumes that *rows* and *cols* are integers)

```
double **A= NULL;
double  *mrow;
int      row;
A    = (double **) calloc((size_t) rows,sizeof(double *));
mrow = (double *) calloc((size_t) rows*cols, sizeof(double));
for(row= 0; row < rows; ++row, mrow+= cols) A[row]= mrow;
```

   One may then use `A[row][col]` to provide access to the row^{th}, col^{th} element of array A.

2. Be sure your program works with rectangular as well as square matrices.