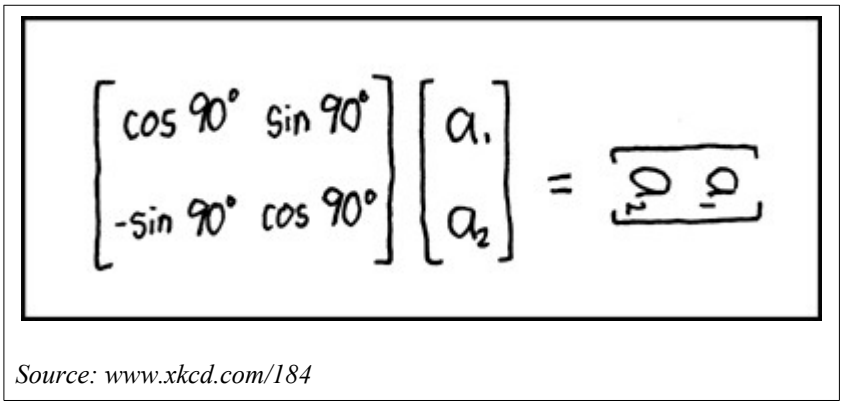
CS 218 – MIPS Assignment #4

Purpose: Become familiar with the MIPS Instruction Set, and the MIPS standard calling convention, and indexing for multiple dimension arrays.
Due: Thursday (4/25)
Points: 80

Assignment:
Write a simple assembly language function perform matrix multiplication[1]. Each matrix is implemented as a two-dimension array. The provided main calls two functions:



Source: www.xkcd.com/184

- Write a MIPS void function, ***matrixPrint()***, to display a two-dimensional matrix. The numbers should be printed in a two-dimensional format (see example output). All numbers must be right justified (i.e., lined up on right side). This function will be called by the main and by the ***matrixMult()*** function.

- Write a MIPS void function, ***multMatrix()***, to multiply two matrix's and store the result into a third matrix. Assuming declarations of **MA**(***iDim***, ***kDim***), **MB**(***kDim***, ***jDim***), and **MC**(***iDim***, ***jDim***):

```
for (i=0; i<idim; i++) {
        for j=0; j<jdim; j++) {
                for (k=0; k<kdim; k++) {
                        MC(i,j) = MC(i,j) + MA(i,k) * MB(k,j)
                }
        }
}
```

  The ***multMatrix()*** function must use the ***matrixPrint()*** routine to print the two input matrix's with the appropriate headers. See example output for formatting. The main will print the final resulting matrix.

To compute the address of of an element in a two-dimensional array, use the following formula:

```
board(row,col) = baseAddress + (rowIndex * colSize + colIndex) * dataSize
```

You must use this formula. Submissions not using this formula will not be scored.

1 For more information, refer to: https://en.wikipedia.org/wiki/Matrix_multiplication

Submission:
When complete, submit:

- A copy of the **source file** via the class web page before class time.

Example Output:
The following is an example output for the first two matrix multiplication operations.

```
MIPS Assignment #4
Program to perform matrix multiplication.

----------------------------------------
Matrix Set #1

Matrix MA

     10     20     30     40

Matrix MB

     50
     60
     70
     80


Matrix MC = (Matrix MA * Matrix MB)

   7000


----------------------------------------
Matrix Set #2

Matrix MA

     10     20
     30     30
     50     60

Matrix MB

     15     25     35
     45     55     60


Matrix MC = (Matrix MA * Matrix MB)

   1050   1350   1550
   1800   2400   2850
   3450   4550   5350
```