**EE150 Project Prof. David Kuijt**

**Project 1: Matrix Operations**

**Due: Thurs Oct 13, midnight**

**Project Description:**

In this project, you will write a program that reads an integer matrix A from standard input, and outputs the following:

* input matrix A
* transpose matrix AT
* product of the input matrix with its transpose A× AT

1. The input matrix A is limited to have at most 10 rows and 10 columns. Given a matrix A has *m* rows and *n* columns, *m* ≤ 10 and *n* ≤ 10. Note that *m* and *n* need not be equal.
2. Input to the program starts with a positive integer n that gives the number of columns in A. This integer is followed by (*m* \* *n*) integers that specify, row by row, the elements of A. Integers are separated in the input by white space. Note that only *n* is explicitly specified in the input.
3. The results should be displayed to standard output using a minimum field width of 3 for each element (%3d), and a single space between adjacent fields on the same line. Each matrix that is printed should be preceded by a line of descriptive text.
4. Your program should check thoroughly for relevant errors. Upon encountering an error the program should report an informative error message and exit using the exit function of C. For example: if *n* (the first number in the input) is a negative number or if *n* > 10.

**Basics on Matrix:**

* ***Transpose:*** Given a matrix A has n rows and m columns, the transpose of A is a matrix B with m rows and n columns where bji = aij.
* ***Multiplication:*** Matrix multiplication can be done between two matrices if the number of columns in the first matrix is equal to the number of rows in the second matrix. That is An×m ×Bm×k = Cn×k, where .

**Project Requirements:**

* 1. The program must be properly indented and documented.
  2. When submitting your project, please submit an archive of your entire project directory (i.e., matrix\_operations.tar.gz)
  3. No late submission will be accepted.
  4. Grading guideline:   
     -- Correctness under normal input 60%

-- Error handling 20%

-- Proper indentation and documentation 10%

-- Reasonable output format 10%