CSL102
ASSIGNMENT 4

Deadline: 30 September 2012

We will represent a matrix as a list of lists. For example, [[1,2],[3,4],[5,6]] corresponds to a 3×2 matrix where [1,2], [3,4] and [5,6] represent the first, second and third rows of the matrix respectively.

Q1. Given a matrix represented in the above form, write higher order ML functions to perform the following operations.

(a) Check whether the given list of lists indeed represents a valid matrix i.e. number of elements in each sub-lists is the same. [[7,8],[9,10]] represents a valid matrix whereas [[3,4],[2]] does not.

(b) Display the given list of lists using the standard matrix representation i.e. one row in each line.

Q2. Write a higher order ML function to find the transpose of the given matrix by interchanging its rows and columns. Your function should output an error message if the representation does not correspond to a valid matrix.

Q3. Write a higher order ML function to check if the matrix is singular. Since singularity is defined only for square matrices, your function should output an error if the matrix is not a square matrix.
Hint: A square matrix is singular if its determinant is zero.

Note: Refer the following link:
http://www.cse.iitd.ernet.in/~sak/courses/icp/new-slides.pdf