INTRODUCTION TO COMPUTING

EXERCISE 5

DECEMBER 2014

Implement the following. Decide carefully on the function prototype yourself:

1. A function that calculates the maximum value in a given column of a given two dimensional array.
2. A function to compute the sum of all entries in a given row in a given two dimensional array.
3. A function to compute the sum of squares of all diagonal entries in a given square matrix
4. A function which checks whether a given square matrix is a diagonal matrix or not. A diagonal matrix is one that has only zeros at non-diagonal entries and any value including zero at the diagonal entries.
5. A function that computes the trace of a given square matrix. The trace of a square matrix is given by the sum of all entries on the diagonal.
6. A function to replace one given row of a given matrix with another given row.
7. A function that exchanges two columns of a given matrix.
8. A function, which when passed a value, searches for it in a matrix and returns its column number and row number.
9. A function to input names of 10 students of a class. (Here you require an array of strings, which is basically a two dimensional array of characters.)
10. A function that sorts an array of strings.

**GUI PROBLEMS**

|  |  |
| --- | --- |
| Problem 1: Read screen coordinates from file into a 2D matrix | **Estimated completion time (mins):** 15 |

Store some screen coordinates in a text file and read them. For example, your text file can have:

10 2

0 0

20 10

2 20

10 5

(this is just one example, you can have more)

These points should be stored as a 2D matrix. You can re-use this function from the last lab

|  |  |
| --- | --- |
| Problem 2: Create an animation so that a character moves on the screen according to the coordinates read from file | **Estimated completion time (mins):** 45 |

Implement this function: MoveCharacter(char c, int coordinates[][COLS],….) (add other parameters you need

This function should move the character c on the screen on these coordinates. So for example if your 2D Matrix has {{10,2},{0,0},{20,10}} then start the character at (10,2) then move the character to (0,0) and next to (20,10). It should be a smooth animation and you will need the equation of a line to move the character between two points.