ESc101N: Fundamentals of computing(Lab Session 8)

September 24, 2009

Instructions

1. Please read the question carefully and write the program accordingly

2. Make sure that the TA has graded you program

3. The marks are distributed as follows. You get 60% of the marks if the basic algorithm is current, 20% if you manage to compile and execute and 20% for writing the code cleanly, i.e. using proper variable names, intending and making the code more readable.

Question 1. (a) Write a `C` functions for the following tasks.

- i. (2 marks) The function `int ** allocMatrix(int m, int n)` that will allocates, using malloc, space for an $m \times n$ matrix.
- ii. (2 marks) The function `void free(int **a, int m)` to free up the memory allocated for an $m \times n$ matrix.
- iii. ($\frac{1}{2}$ mark) The function `void readMatrix(int **a, int m, int n)` that reads an $m \times n$ matrix.
- iv. ($\frac{1}{2}$ mark) The function `void printMatrix(int **a, int m, int n)` that prints an $m \times n$ matrix.

(b) (5 marks) Write the function `int ** transpose(int **a, int m, int n)` that given an $m \times n$ matrix returns the transpose of it.

The sample solution is given below

```
Script started on Thu 24 Sep 2009 13:38:03 IST
$ ./a.out
enter the number m of rows of first matrix:2
enter the number n of columns:3
enter the matrix:
        enter [0][0] th entry:1
        enter [0][1] th entry:2
        enter [0][2] th entry:3
        enter [1][0] th entry:2
        enter [1][1] th entry:3
        enter [1][2] th entry:4
The transpose of the matrix:
        1       2       3
        2       3       4
is
        1       2
        2       3
        3       4
$
Script done on Thu 24 Sep 2009 13:38:08 IST
```