ESc101N: Fundamentals of computing(Lab Session 8)

October 5, 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 ** transposeMul(int **a, int **b, int m, int n, int p)` that takes as argument matrices A and B, represented by arrays `a` and `b` resepctively and computes $A^T B$

The sample solution is given below

```
Script started on Mon 05 Oct 2009 12:02:04 IST
$ ./a.out
enter the number m of rows of first (and second) matrix :2
enter the number n of columns of first matrix:3
enter the number p of columns of second matrix:4
enter the first matrix:
        enter [0][0] th entry:1
        enter [0][1] th entry:2
        enter [0][2] th entry:3
        enter [1][0] th entry:1
        enter [1][1] th entry:1
        enter [1][2] th entry:1
enter the second matrix:
        enter [0][0] th entry:1
        enter [0][1] th entry:1
        enter [0][2] th entry:1
        enter [0][3] th entry:1
        enter [1][0] th entry:2
```

```
        enter [1][1] th entry:2
        enter [1][2] th entry:2
        enter [1][3] th entry:2
The transpose product of the matrices:
        1       2       3
        1       1       1
and
        1       1       1       1
        2       2       2       2
are
        3       3       3       3
        4       4       4       4
        5       5       5       5

Script done on Mon 05 Oct 2009 12:02:30 IST
$
```