Computing Systems Lab

IT69101

(Autumn 2010)

Assignment #1 21/07/2010

1. **(a)** Allocate an array of integers of size, say *n*, dynamically and initialize the array from data stored in a file.

(b) Repeat the same procedure for string data.

2. Dynamically allocate two memory $A_{m\times p}$ and $B_{p\times n}$. Initialize the array with some data stored in a file. Obtain the multiplication $C_{m\times n} = A_{m\times p} \times B_{p\times n}$ using the rule of matrix multiplication. Display the results of A, B and C.

3. Consider the following sparse matrices each of $m\times n$ order.

(a) Lower triangular matrix

(b) Upper triangular matrix

(c) Tri-diagonal matrix

Store elements in each of the above mentioned matrices. Then store the elements in an array with row-major order. Access any element in the array with respect to its location as specified by two indexes in the matrix.

4. Consider any sparse matrix of size $m\times n$ and suitable data in it. Using a suitable node structure for linked list, store the matrix. Display the matrix from the linked list representation of the matrix.

5. Using a suitable node structure for representing a homogeneous polynomial of degree *n* store any two polynomials. Then find the following:

(a) Evaluate for a given value of input variable using Horner's rule of polynomial evaluation.

(b) Addition of two polynomials.

(c) Multiplication of two polynomials.

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