

INDIAN STATISTICAL INSTITUTE

Laboratory Test I (Part II)

M. Tech (CS) - I Year, 2013-2014 (Semester - I)

Data and File Structures Laboratory

Date: 17.08.2013

Total Marks : $71 + 5 = 76$ (5 marks for good programming habits)

- (Q1) Write a C program that reads a positive integer $n > 2$ and prints the largest *proper* divisor m of n . As an example, for $n = 60$, your program should print $m = 30$. For $n = 61$, your program should print $m = 1$. [15]
- (Q2) Write a C program that does the following:
- (a) Takes as input two integers M and N from the user and creates a 2D array \mathcal{A} of N rows and M columns of integers dynamically using pointer to pointer. [8]
 - (b) Fills \mathcal{A} with integers from 1 to $N \times M$ in a row major order. [3]
 - (c) Prints \mathcal{A} according to the following sequence: the first diagonal, last diagonal, second diagonal, last but one diagonal, and so on till all elements of the matrix is printed exactly once. See Figure 1 for an example. The function for printing should be recursive. You would lose credit if you write an iterative version. [45]
[Note: The maximum you can score if you write an iterative version is 35.]

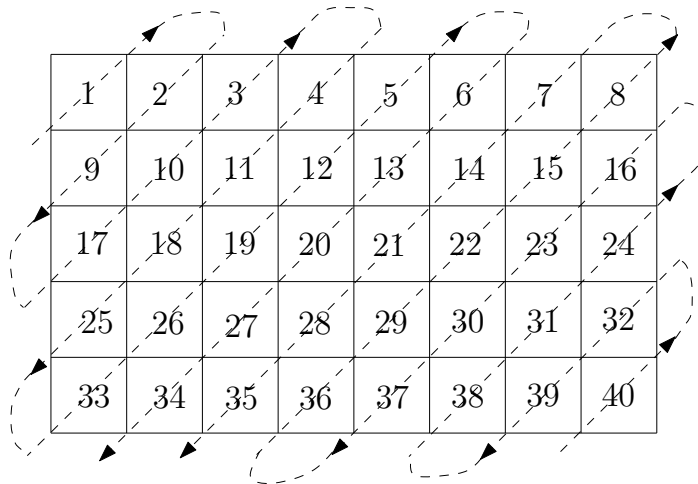


Figure 1: An example with $N = 5$ and $M = 8$. The order of the printing will be 1, 40, 2, 9, 32, 39, 17, 10, 3, 38, 31, 24, 4, 11, 18, 25, 16, 23, 30, 37, 33, 26, 19, 12, 5, 36, 29, 22, 15, 8, 6, 13, 20, 27, 34, 7, 14, 21, 28, 35.