Programming and Data Structures Lab (CS2710)

Assignment-02: *Problem Solving using Recursions*

Lab-work:

1. Implement Fibonacci Series in two ways:
   (a) Using Recursion and (b) Without Recursion (Iteratively)
   Inputs: The total number of elements (n) in the series
   Outputs:
   (a) Fibonacci Series of n-elements; and
   (b) The overall time required (given by system in which the program is running)

   Experiment the following thing:
   Plot a graph showing the calculation time required in y-axis vs. the increasing size of array (n) in x-axis (for both recursive and iterative case).

2. Implement the Determinant of a Matrix of Integers
   Inputs: A NxN Matrix containing Integer elements
   Outputs: The Determinant of the given NxN Matrix

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Home-work:

1. Implement the N-Queens Problem
   Inputs:
   (a) A NxN Chessboard; and
   (b) N Queens
   Outputs: Place N Queens in NxN Chessboard so that no queen can attack the other queens
   Hint: In Chess, Queens cannot take the move of a Horse

   Experiment the following thing:
   If multiple arrangements are possible, then give the total number of such arrangements possible and showw all the arrangements / formations.

2. Implement Permutations of a set of Integers
   Inputs: An set of n integers
   Outputs: Every possible permutations of n integers (a total of n! in number)
   Example: Input = 1, 4, 9 => Output = 149, 194, 419, 491, 914, 941

3. Implement Tower of Hanoi and Print all the Moves
   Inputs: Number of Disks
   Outputs: Movement of Disks from Source to Destination