**Programming Assignment No. 2**

**Constraint Satisfaction Problems   
[N-Queen Solution Using Iterative Improvement Technique]**

### Guidelines

1. The submission deadline is set to: **Wednesday 20th February 2019 @ 11:59 PM**.
2. **Team-based submission is required.**
3. The submitted solution must **contain a table with the name, id and the contribution of each team member**. The contribution of each member is measured in terms: i) Number of hours spent. ii) Contribution to code improvement.

### Question 1 [N-Queen Problem] [100 Points]

The ***N***-Queens problem is the problem of positioning ***N*** Queens on a ***NxN*** chess board such that no Queen can "***take***" another Queen by moving horizontally, vertically, or diagonally (standard chess Queen movement).

Write a program to solve the ***N***-Queens problem the ***iterative improvement technique*** and the ***min-Conflict*** measure. This problem requires that your program find a solution to the problem of placing the largest number of queens on a chess board with the constraint that no queen can "***take***" any other queen. Your program should print out the reached solution.

**Note 1:** Since this is an iterative approach, you should run your solution ***1000*** times to obtain the average time required to reach a solution state for the problem.

**Note 2:** Your code should be flexible to run for different values of ***N*** (the number of queens). The average execution times using ***1000*** runs and different values of ***N*** should be provided in a table similar to that below:

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **N** | **4** | **5** | **6** | **7** | **8** | **9** |
| **Time (sec)** | 0.00306 | 0.00608 | 0.23577 | 0.4453 | 3.94 | 27.87 |
| **#Runs** | 1000 | 1000 | 1000 | 50 | 50 | 50 |

**Team Members are**

**Abdullah Barnawi**

**Asaad Alghamdi**

**Abdullrahman Hajr**

**We equally contributed in this project**