CSC 1103 – Object Oriented Programming | INDIVIDUAL ASSIGNMENT | Semester 2, 2019/2020

1. INSTRUCTIONS:

- Name, Matric number & Section should be included in the comments of the program file/s, at the beginning.
- Submit your files by uploading them to the google classroom.
- All files must be submitted as .java or .txt.
- This is an **exploratory assignment**. You are free to refer to any online/offline resources as long as you don't plagiarise and refer to your sources. Any form of plagiarism is highly unacceptable.
- Assignment bears 10 Marks (10% of your Total Course Evaluation).

2. IMPORTANT DATES

SUBMISSION DEADLINE	12 th July 2020, 11: 50 PM

• Any assignment submitted by **09**th **July 2020, 08:00 PM** will be given a **bonus** of 2 Marks. The bonus will be given, if the assignment scores at least **7 Marks** upon checking.

3. EXERCISES

Exercise 1: The Eight Queens problem is to find a solution to place a queen in each row on a chessboard such that no two queens can attack each other. You can use a two-dimensional array to represent a chessboard. However, since each row can have only one queen, it is sufficient to use a one-dimensional array to denote the position of the queen in the row. Thus, you can define the **queens** array as:

```
int[] queens = new int[8];
```

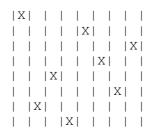
Assign **j** to **queens**[i] to denote that a queen is placed in row **i** and column **j**.

Define a class named EQ to represent eight queens in a chess board with the following members:

- 1. A private data field queens of the type int[].
- 2. A no-arg constructor that constructs an object of EQ default queens values of -1s in the array.

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- 3. A constructor named EQ(int[] queens) that constructs an object of EQ with the specified queen placement.
- 4. A method named get(int i) that returns queens[i].
- 5. A method named set(int i, int j) that sets queens[i] with j.
- 6. A method named isSolved() that returns true if all queens are placed in the board correctly.
- 7. A method named printBoard() that displays the board with the queens like the following:



NOTE: DO NOT USE BACKTRACKING FOR THIS EXERCISE

Implement the class and use the following program to test your class.

```
public static void main(String[] args) {
   EQ board1 = new EQ();
   board1.set(0, 2);
   board1.set(1, 4);
   board1.set(2, 7);
   board1.set(3, 1);
   board1.set(4, 0);
   board1.set(5, 3);
   board1.set(6, 6);
   board1.set(7, 5);
   System.out.println("Is board 1 a correct eight queen placement?
       + board1.isSolved());
   EQ board2 = new EQ(new int[] \{ 0, 4, 7, 5, 2, 6, 1, 3 \});
   if (board2.isSolved()) {
     System.out.println("Eight queens are placed correctly "
       + "in board 2");
     board2.printBoard();
   else {
     System.out.println("Eight queens are placed incorrectly "
       + "in board 2"); } }
```

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Exercise 2: Arguments for the main method are passed as strings. Strings enclosed in quotation marks are considered as one argument. Write a program to parse arguments from a string. Arguments are separated by spaces. Enclosed strings are considered as one argument. Your program should prompt the user to enter a string and display the arguments, each per line. [Set the name of the class as *parsec* with main()]

END OF DOCUMENT