



Manipal University
Jaipur

Sudoku Game using Graph coloring

- SHRESHT BHATIA

PROJECT REPORT

Name/Title of the project:-

Sudoku Game using Graph coloring.

Statement about the problem:-

A graph G is a mathematical structure consisting of two sets $V(G)$ (vertices of G) and $E(G)$ (edges of G). Proper colouring of a graph is an assignment of colours either to the vertices of the graphs, or to the edges, in such a way that adjacent vertices / edges are coloured differently. Use this graph colouring problem in solving the sudoku game.

Obejective and scope of Project:-

This web portal is a Sudoku game that is an $n \times n$ matrix consisting of some already filled values, and it has to be filled by the user in a way that every row and every column has each of the values ranging from 1 to n once. This means that no row or column can have any repeated element. We use the Graph Colouring technique for the Sudoku game.

Technologies used in the project:-

HTML, CSS, JavaScript.

Summary of the Project:-

On the home page, the user has three options/difficulty levels. He can choose to play a 3X3, 6X6 or 9X9 sudoku game. When he clicks on an option he is redirected to another page displaying four choices, each of which has a different Sudoku game inside it. When the user selects an example, he is redirected to another page displaying a Sudoku and a submit button. The Sudoku has some already filled values and other cells needs to be filled by the user. If the user leaves any cell empty or enters a value not in the range of 1 to n, an alert box appears saying “Please enter values between 1 and n only”. If the user submits an incorrect/correct solution, the same is displayed on the screen.

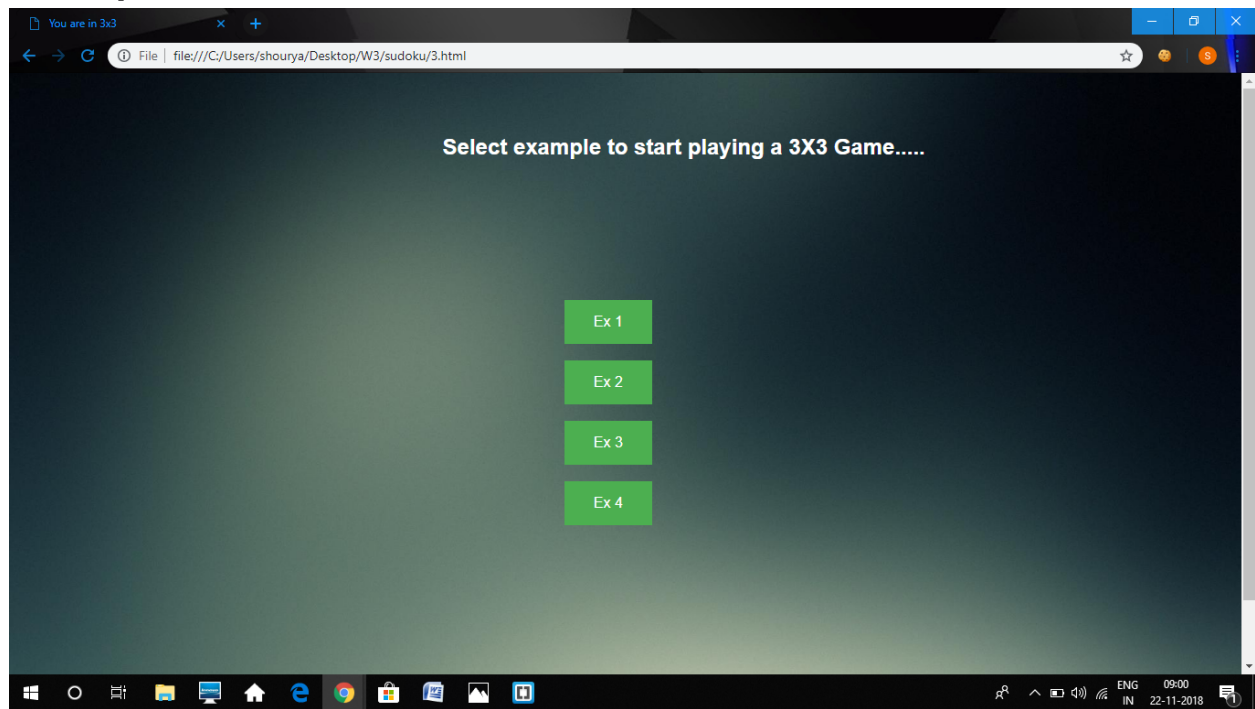
In the source code, first an adjacency matrix is created according to the degree of the game selected. Each Sudoku cell is considered as a vertice of the graph. This means for an $n \times n$ Sudoku, the adjacency matrix is of $(n^2) \times (n^2)$. When submit button is clicked after filling the values, the values entered by the user are taken in order and put in a 1D array. Using the input array and the adjacency matrix, the conditions of the Sudoku are checked and the output is generated.

Snapshots:-

Home Page:



Example Selection :



3X3 Game :

You are in 3x3 ex 1

File | file:///C:/Users/shourya/Desktop/W3/sudoku/3ex1.html

1		
	2	
		3

Submit

6X6 Game:

You are in 6x6 ex 1

File | file:///C:/Users/shourya/Desktop/W3/sudoku/6ex1.html

				6	2
	3				5
5			6		
		3			1
4				1	
3	2				

Submit

9X9 Game:

You are in 9x9 ex 1

File | file:///C:/Users/shourya/Desktop/W3/sudoku/9ex1.html

				2		4		5
			9					7
			6		8	2		
	4			5		3		
8		9				6		2
		3		9			4	
		2	5		9			
9					2			
7		4		6				

Submit

Windows taskbar: ENG IN 08:55 22-11-2018