

CS101 PROJECT 2015

# SUDOKU AUTOSOLVER

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# INTRODUCTION

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Sudoku(normal) is a puzzle game in which a 9x9 grid with a few numbers given by the user and our program is expected to solve it by filling in all numbers from 1 to 9 in every row, column and certain 3x3 squares without repeatation . Because of the dimensions of the grid, no number is repeated along a row, Column or a 3x3 square.

- Different types of sudoku:

1. Normal,
2. Diagonal,
3. Windows,etc.

## 1. Normal Sudoku : Usual general sudoku.

1			3					5
	2	3		7			4	9
9			4			6		
8					3		1	
	4			1		8		
3					7		5	
2			5			9		
	5	6		9	4		2	8
4			7					

1	6	4	3	2	9	7	8	5
5	2	3	8	7	6	1	4	9
9	7	8	4	5	1	6	3	2
8	9	5	6	4	3	2	1	7
6	4	7	2	1	5	8	9	3
3	1	2	9	8	7	4	5	6
2	3	1	5	6	8	9	7	4
7	5	6	1	9	4	3	2	8
4	8	9	7	3	2	5	6	1

## 2. Diagonal Sudoku :

Diagonal Sudoku is also played over a 9x9 grid divided to 3x3 sub grids or boxes. The objective is to fill a grid with digits so that each column, each row, and each of the nine boxes that compose the grid contains all of the digits from 1 to 9 and each digit appears once. Also the main diagonals of the grid contains all of the digits from 1 to 9 and each digit appears once.

		1	9		3	2		
			1		8			
3								8
7	3						2	9
1	2						8	3
2								4
			7		9			
		5	4		2	9		

5	8	1	9	6	3	2	4	7
4	9	2	1	7	8	6	3	5
3	6	7	2	4	5	1	9	8
7	3	4	8	1	6	5	2	9
9	5	8	3	2	7	4	6	1
1	2	6	5	9	4	7	8	3
2	7	9	6	8	1	3	5	4
6	4	3	7	5	9	8	1	2
8	1	5	4	3	2	9	7	6

### 3.Windows Sudoku :

Window Sudoku is also played over a 9x9 grid divided to 3x3 sub grids or boxes. The objective is to fill a grid with digits so that each column, each row, and each of the nine boxes that compose the grid contains all of the digits from 1 to 9 and each digit appears once. Also there are four additional boxes in the grid that contain all of the digits from 1 to 9 and each digit appears once

							1	
		2					3	4
				5	1			
					6	5		
	7		3				8	
		3						
				8				
5	8					9		
6	9							

9	4	6	8	3	2	7	1	5
1	5	2	6	9	7	8	3	4
7	3	8	4	5	1	2	9	6
8	1	9	7	2	6	5	4	3
4	7	5	3	1	9	6	8	2
2	6	3	5	4	8	1	7	9
3	2	7	9	8	5	4	6	1
5	8	4	1	6	3	9	2	7
6	9	1	2	7	4	3	5	8

# PROBLEM STATEMENT

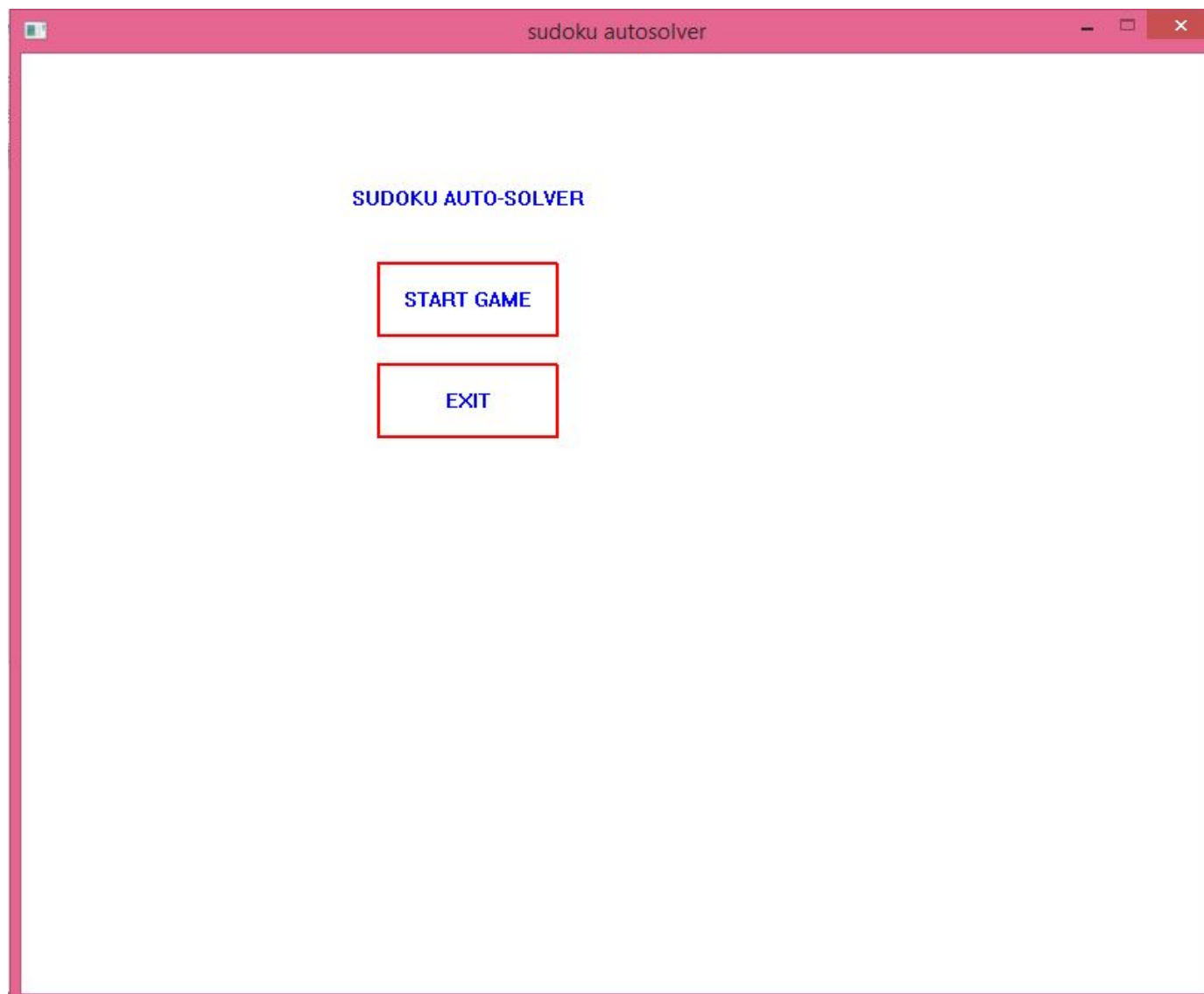
## ➤ GOAL 1:

USER WILL GIVE INPUTS IN A 9X9 GRID ON CANVAS WHEREVER HE WANT AND OUR PROGRAM WILL CHECK WHETHER THE GIVEN INPUTS ARE VALID ACCORDING TO RULES OF SUDOKU PUZZLE.

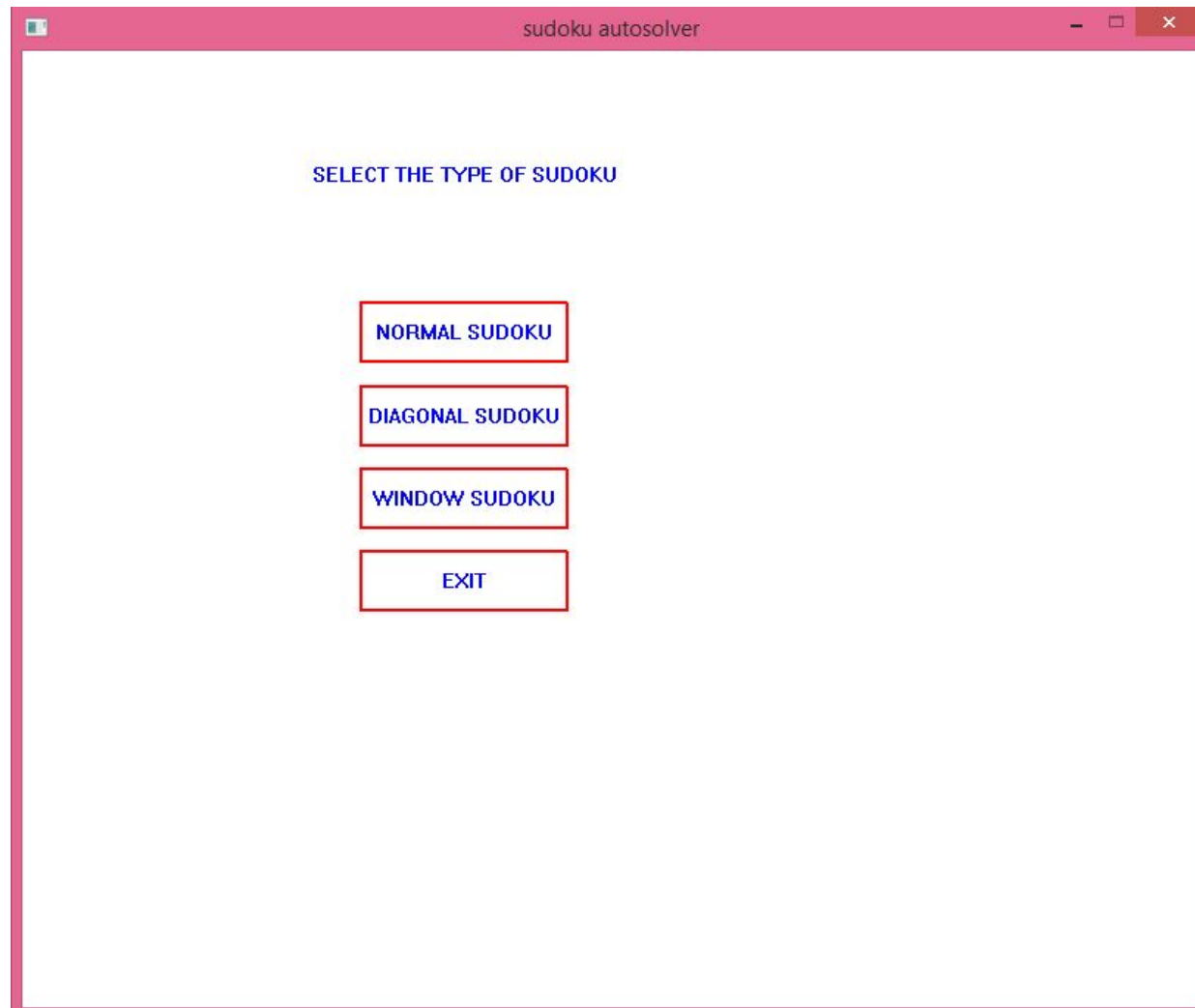
## ➤ GOAL 2:

TO SOLVE A 9 X 9 SUDOKU PUZZLE WHOSE INPUTS ARE GIVEN BY THE USER AND TO SHOW THE SOLVED OUTPUT ON THE CANVAS.

# PROJECT SCREENSHOT



# PROJECT SCREENSHOT





# Input Window For Diagonal Sudoku

sudoku autosolver

GIVE INPUTS

1								7
				2				
6								
				5				8
		3						
3								

DIAGONAL SUDOKU

SOLVE

123456789

INSTRUCTIONS

First click in one of the box in 9x9 grid where you want to give inputs  
Then click on one of 1 to 9 buttons shown below the 9X9 grid  
After giving inputs click on SOLVE button on right side of canvas  
Then solution is displayed  
Then Click once again anywhere on the Canvas to Exit

# Output Window For Diagonal Sudoku

The screenshot shows a window titled "sudoku autosolver" with a pink border. Inside, on the left, is a 9x9 grid of numbers. The grid is as follows:

1	2	4	3	6	5	8	9	7
5	3	7	8	2	9	1	4	6
8	6	9	1	4	7	2	3	5
6	1	5	7	3	8	4	2	9
9	7	2	4	5	1	3	6	8
4	8	3	6	9	2	5	7	1
7	4	1	9	8	3	6	5	2
2	9	6	5	1	4	7	8	3
3	5	8	2	7	6	9	1	4

To the right of the grid, the text "DIAGONAL SUDOKU" is displayed in blue. Below this text is a rectangular button with the word "SOLVE" in black. At the bottom of the window, the word "INSTRUCTIONS" is written in red, followed by a list of steps in black text:

- First click in one of the box in 9x9 grid where you want to give inputs
- Then click on one of 1 to 9 buttons shown below the 9X9 grid
- After giving inputs click on SOLVE button on right side of canvas
- Then solution is displayed
- Then Click once again anywhere on the Canvas to Exit

# Input Screen For Window Sudoku

sudoku autosolver

GIVE INPUTS

2								
				9		3		
	6							
			4				7	
	2						5	

WINDOW SUDOKU

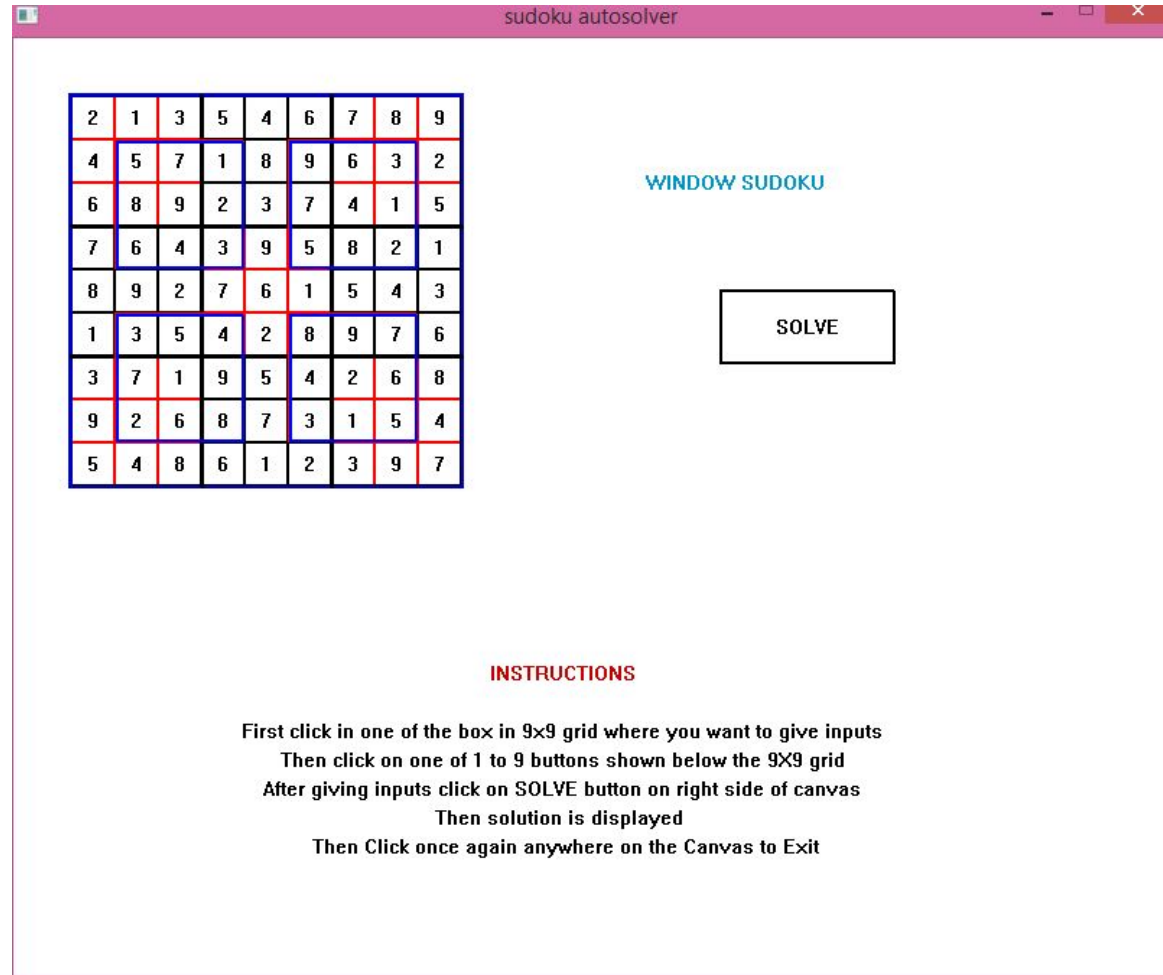
SOLVE

123456789

INSTRUCTIONS

First click in one of the box in 9x9 grid where you want to give inputs  
Then click on one of 1 to 9 buttons shown below the 9X9 grid  
After giving inputs click on SOLVE button on right side of canvas  
Then solution is displayed  
Then Click once again anywhere on the Canvas to Exit

# Output Screen For Window Sudoku



# INSTRUCTION FOR USE

## General guidelines

- As soon as the user runs the application, the user is provide with two options which are:
  1. START GAME
  2. EXIT
- To continue,click the START GAME button.  
Then a number of options appear and the user is asked to select the desired  
variant of sudoku that he wishes to solve.
- These options are:
  1. NORMAL SUDOKU
  2. DIAGONAL SUDOKU
  3. WINDOW SUDOKU
  4. EXIT
- The user can then click on the corresponding button to select the desired variant or click EXIT to quit the application.
- On selecting any variant corresponding puzzle begins.
- Now follow the instruction given on the screen to give inputs and solve the sudoku puzzle.

# CHALLENGES

- BACKTRACKING
- TO CONNECT THE INTERFACE PART WITH THE ALGORITHM PART.

## FUTURE WORK

- IMPLEMENT IT TO SOLVE MORE DIFFERENT TYPES OF SUDOKU LIKE WINDOW SUDOKU, DIAGONAL SUDOKU, JIGSAW SUDOKU.
- IF ONE DOES NOT WANT TO PHYSICALLY SOLVE A SUDOKU PUZZLE HE/SHE CAN SCAN THE SUDOKU PUZZLE BY MAKING USE OF IMAGE PROCESSING FROM WHICH OUR PROGRAM WOULD TAKE INPUTS AND GIVE THE OUTPUT.

THANK YOU !