

REPORT OF CONNECT 4 PROJECT:

Team members

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1-Description:

Connect 4 is a two-player game in which the players first choose a color and then takes turns dropping their colored discs from the top into a grid. The pieces fall straight down, occupying the next available space within the column. The objective of the game is to connect-four of one's own discs of the same color next to each other vertically, horizontally, or diagonally. The two players keep playing until the board is full. The winner is the player having greater number of connected fours.

2-Features:

You can play with 2-modes: human vs human or human vs computer.

You can save up to 3 games and load them wherever.

You can undo or redo your moves in game mode.

You can see the n top players with the highest score.

You can change the size of the game and the number of top players from the xml configuration file.

3-Design Overview:

The game is a 2d array with grid between columns and rows, first you see the game main menu and make your choice (new game, load game, top players, quit game) then it will take action according to your choice.

New game: prints the grid, available moves and actions.

Top players: prints a list of top n players with high the highest scores.

Load game: give you 3 choices of 3 saved files.

Quit game: exits the game.

4-Assumptions:

- You shouldn't load a game if you change the size of the game, it will print a garbage grid
- There is a file for count the number of saves done, it mustn't be removed.
- When take the winner's name you mustn't enter a space in the end of the name.
- Names from more than one word isn't sensitive to space between word e.g.(Mostafa Mohamed isn't as MostafaMohamed, but it's case insensitive.
- configuration.xml doesn't give a default value if <configuration> tag is removed.

5-Data Structure:

- Arrays and structures.

6-Description of the important functions/modules:

-main_menu: it prints the game main menu and it has the game modes e.g.(new game, top players ,load game and quit game).

Input: it takes the user input and check its validation as an input and send this input two the action function.

-game_action: it takes the valid input sent by input function and update the action according to this input (player move, a choice from game menu).

-Print: it prints the grid and game information and it update this information after each input from the user.

-Winner: it's called when the board of the game is full and take the winner's name then it shows his rank, score and top players list.

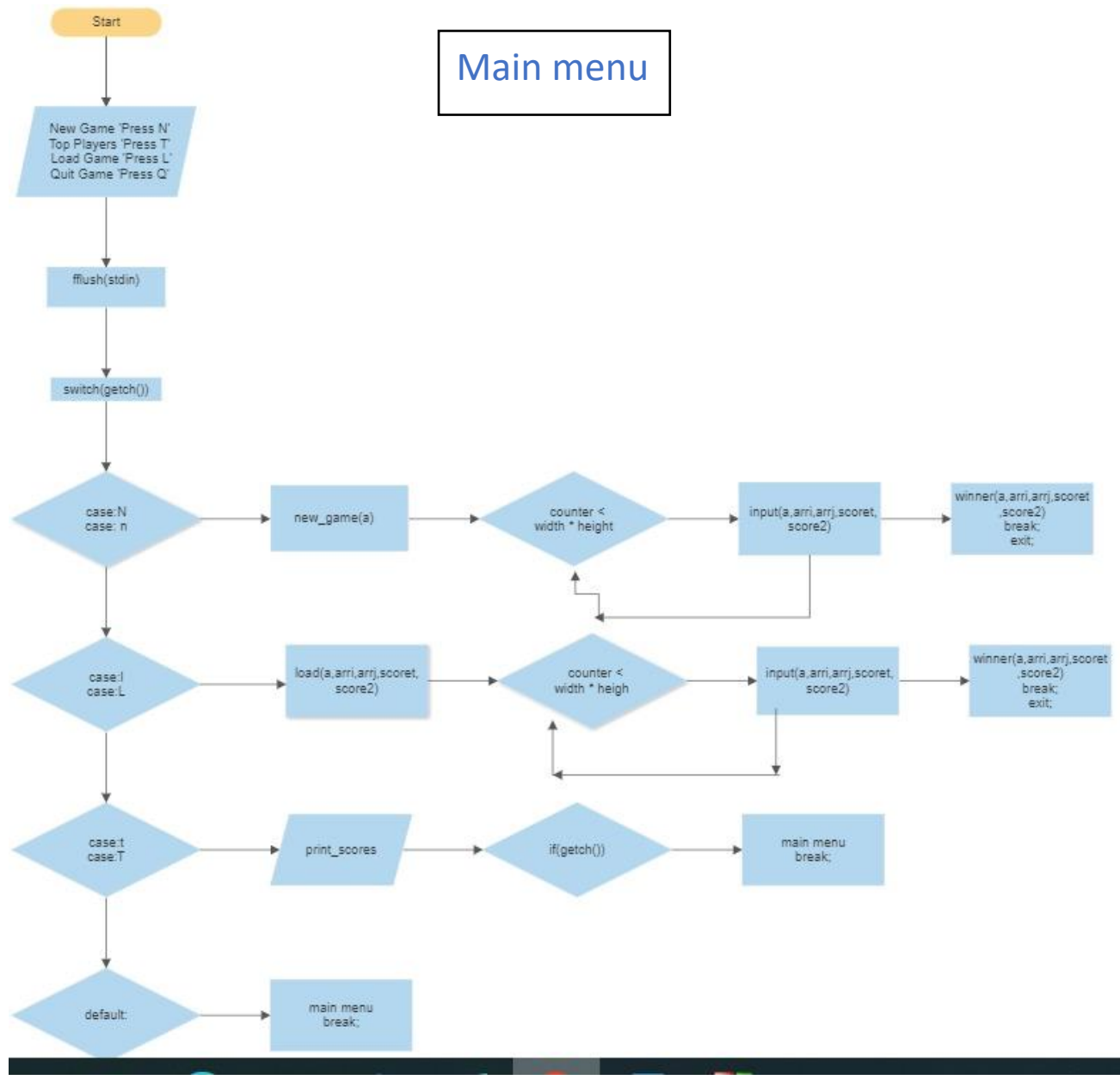
-Header files:

-Casting: it cast the player input to a number if it is a move input.

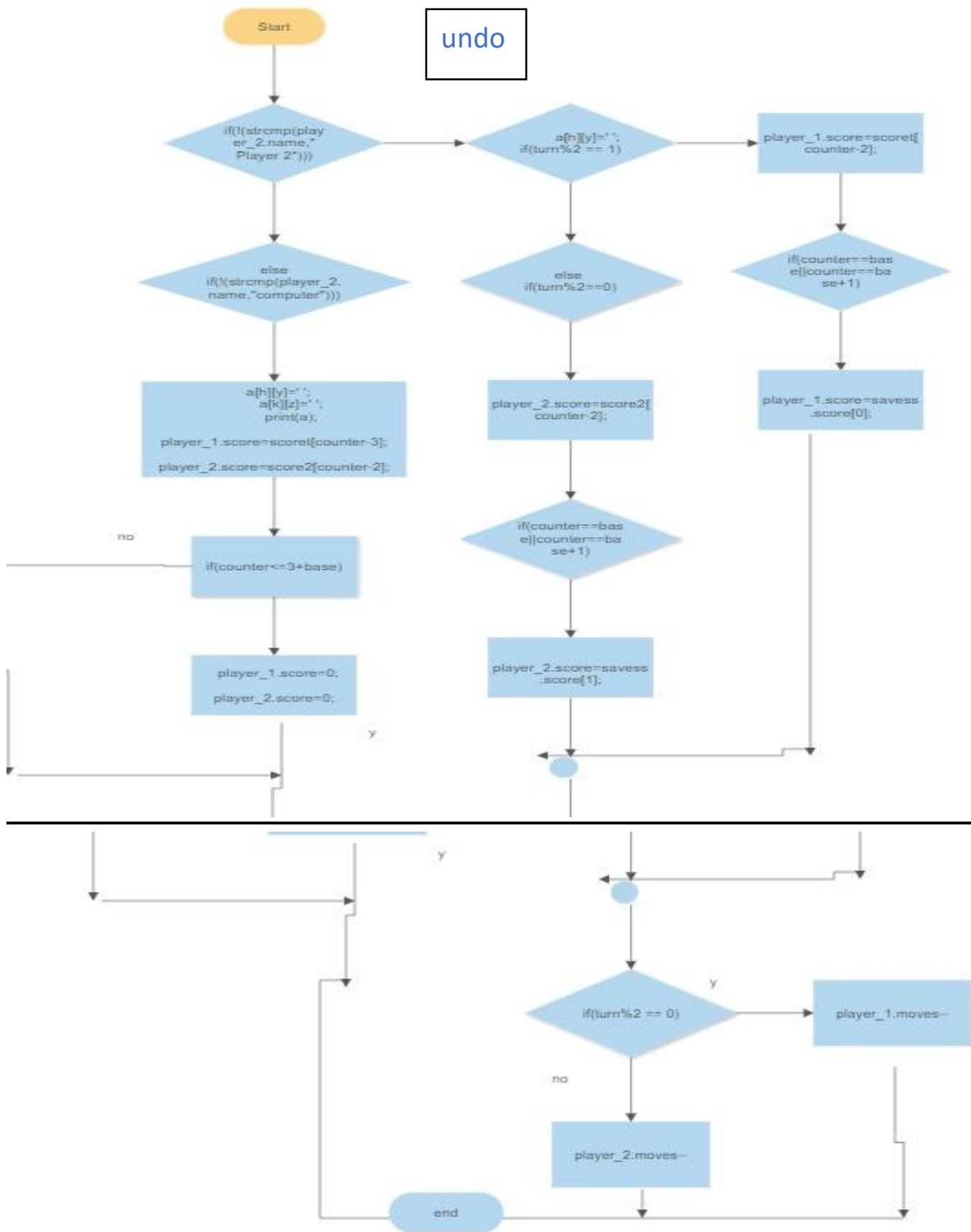
- Check:** it takes the user move and check if there is any new 4-connected so the score increase or not.
- Configuration:** it read the game parameters from the configuration.xml file.
- Load_save:** save or the game if the user needs.
- Top_scores:** it updates the top players list after any winning.
- Undo:** undo or redo the game if the user needs.

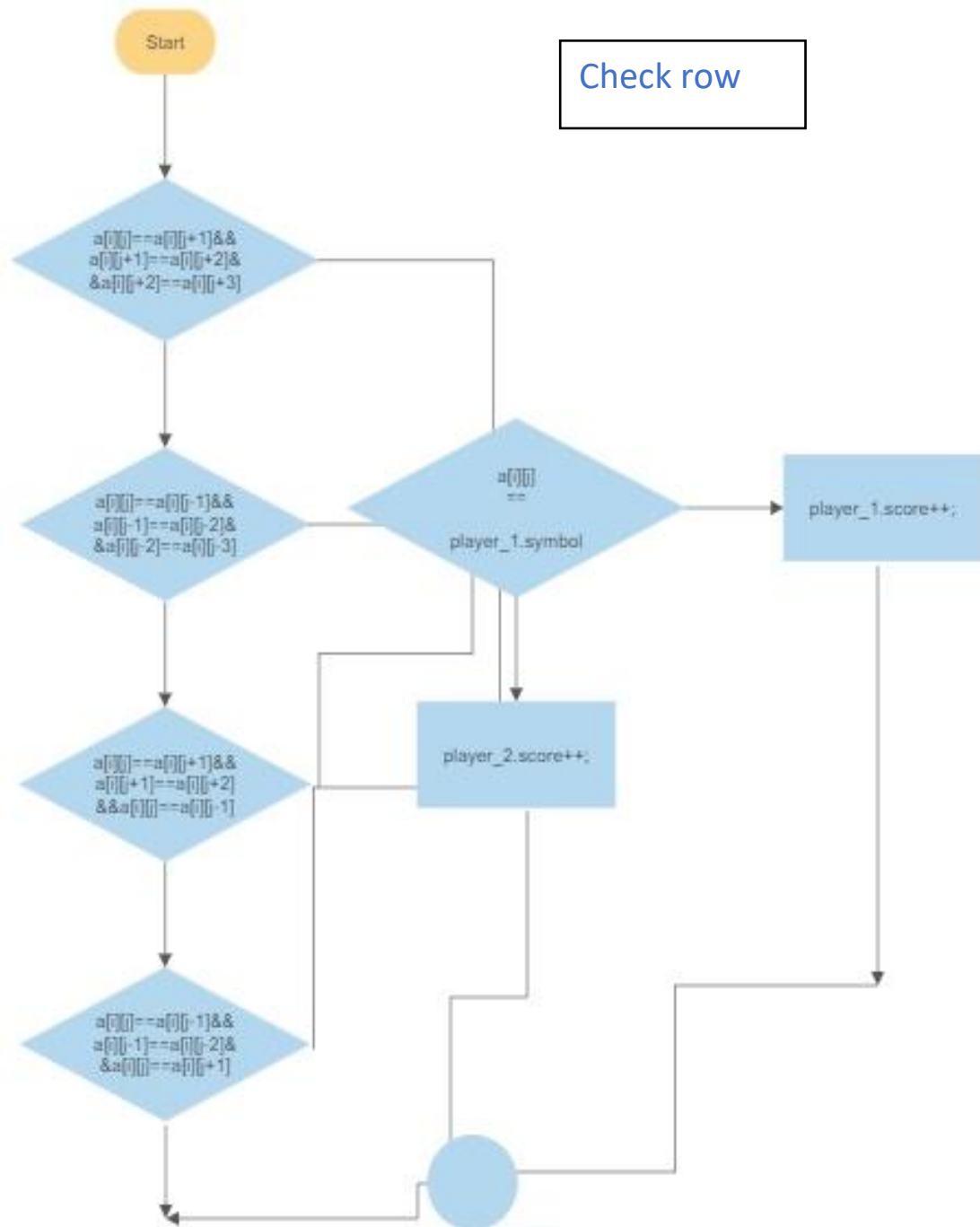
6-Flow chart :

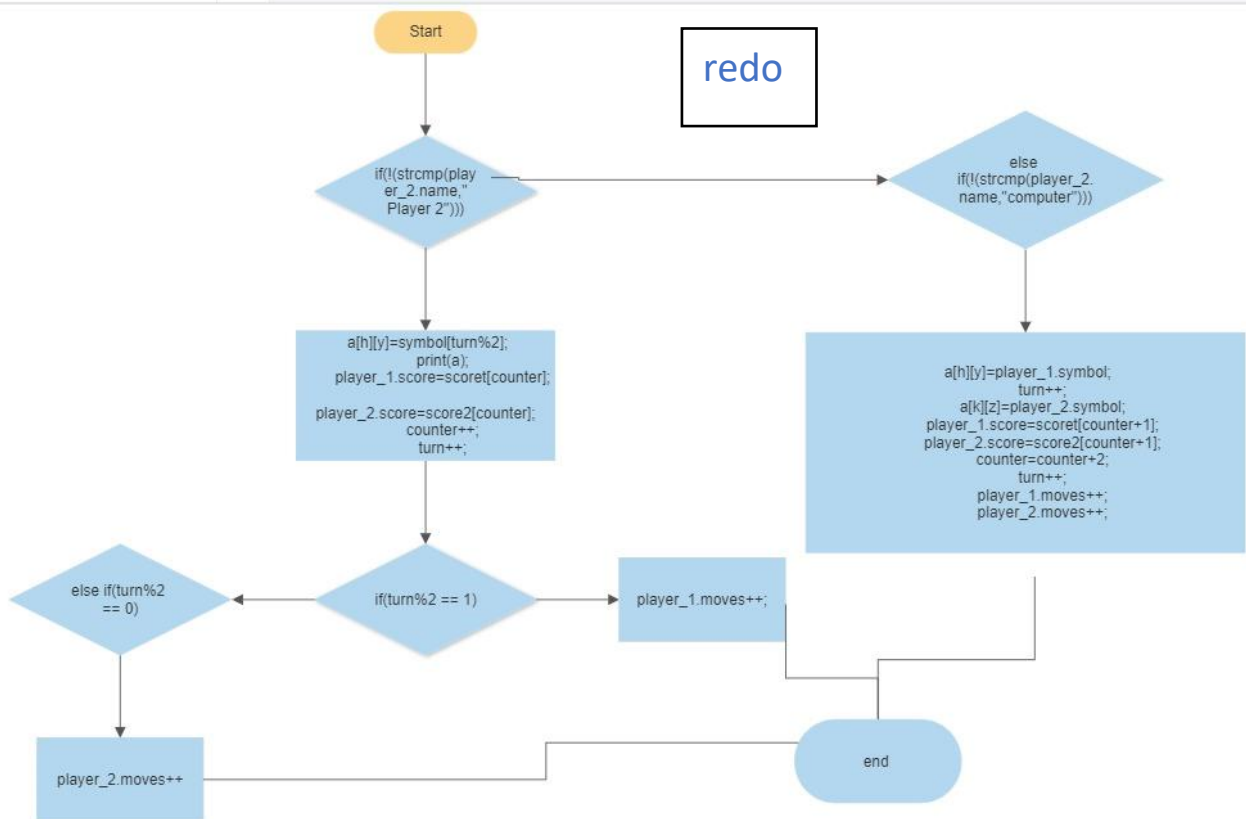
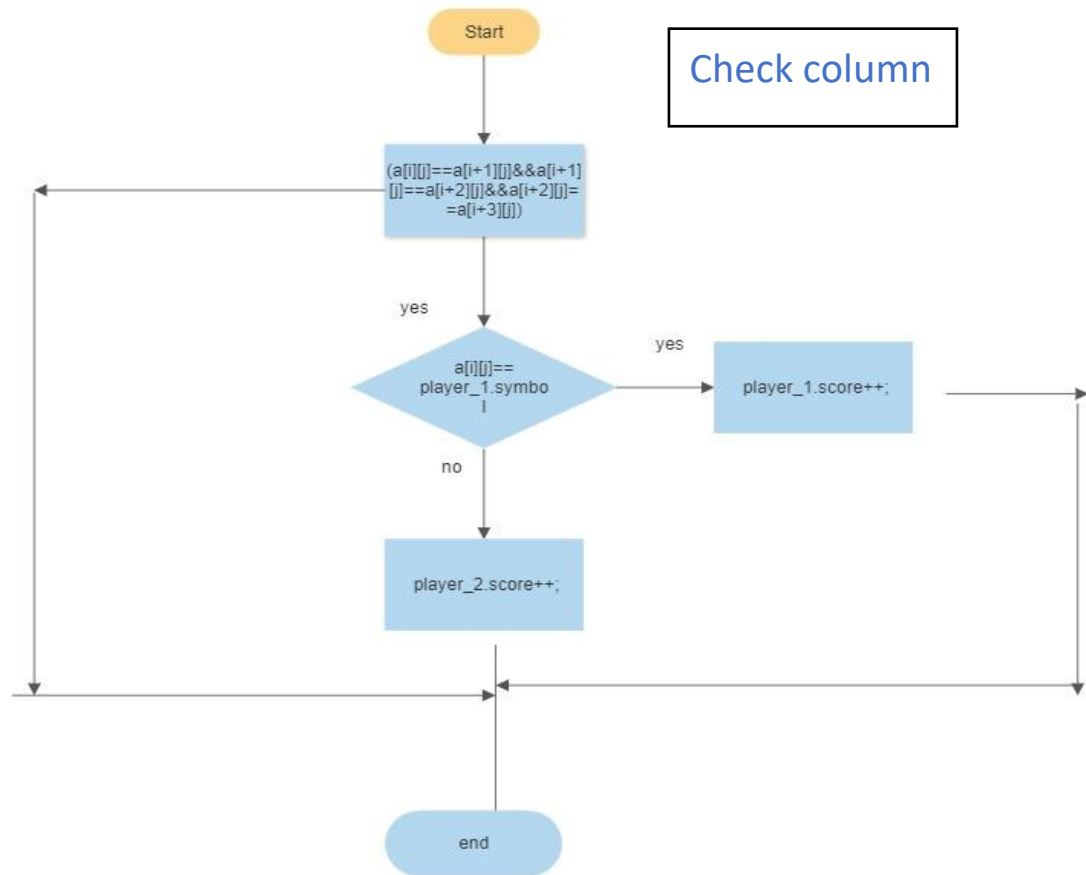
Main menu

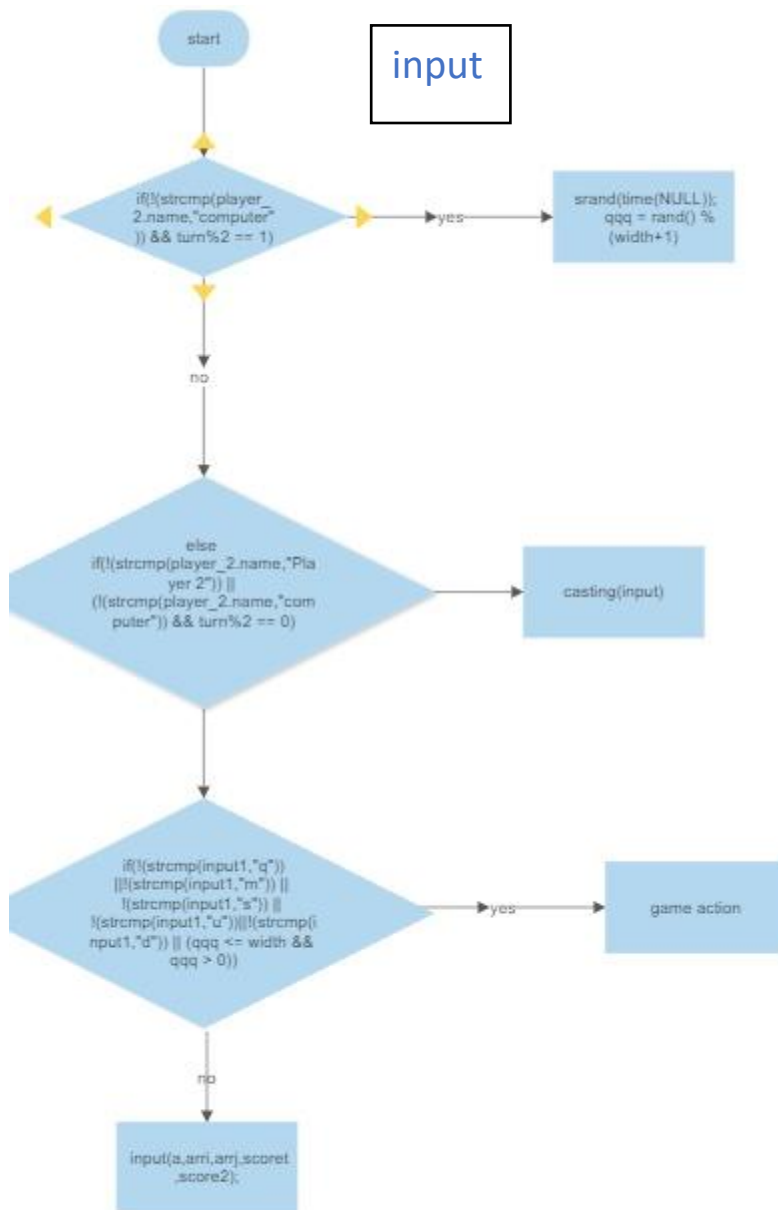


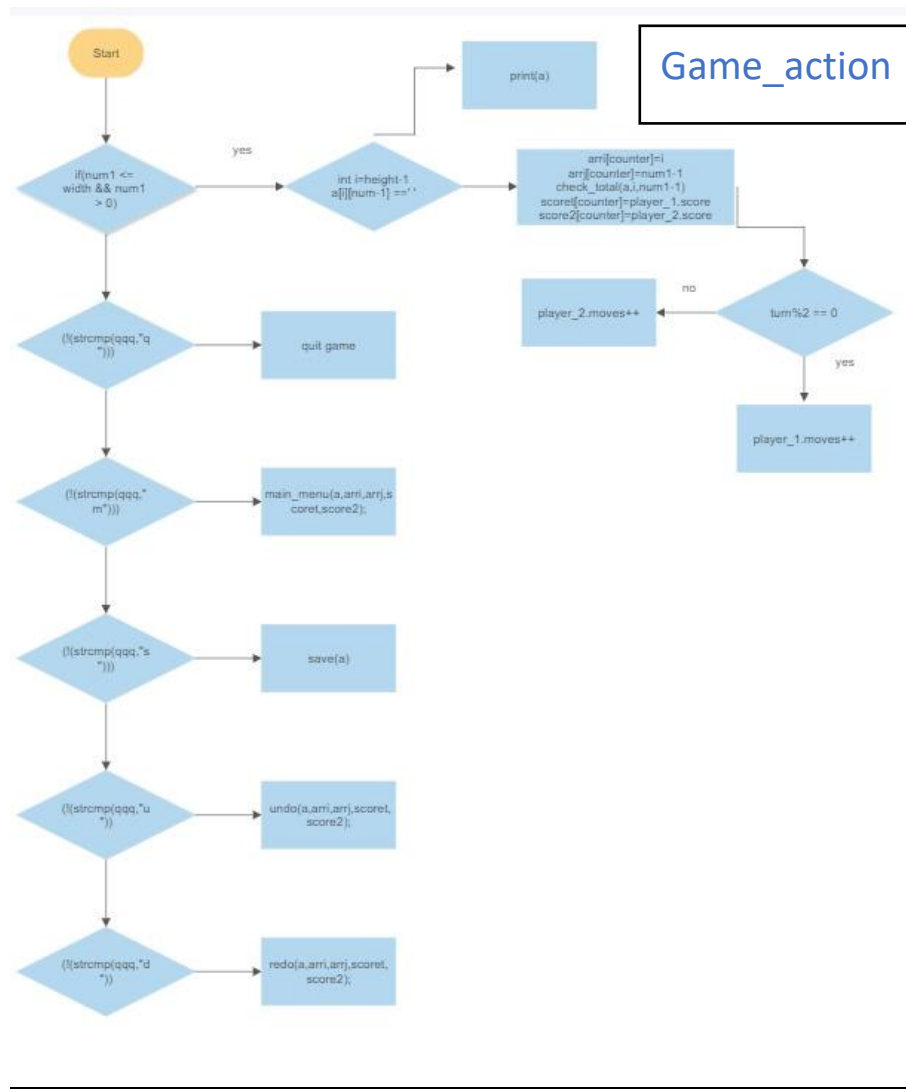
undo











7-User Manual:

First press enter to start the game, make your choice from the main menu by pressing(n for new game, t for top players, l for load a game, q for quit the game).

In new game mode you choose either human mode or computer mode.

In new game mode you press input the move from 1 to width or (u for undo, d for redo, m for main menu, s for save game, q for quit the game).

in load game mode you must choose any of 3 files “if saved” and then play the game.

In top players you will see a sorted list of the highest n scores.

8-Sample runs:

```

Congratulations AHmed...!!!Your score is 6.

AHmed rank is => 6

TOP PLAYERS

Player name      Player score
1 - mostafa      20
2 - MOstafa mohamed      11
3 - MMM          9
4 - Memooo       7
5 - MOka         7
6 - AHmed        6
7 - Ahmeed       6

```

Player name	Player score
1 - mostafa	20
2 - M0stafa mohamed	
3 - MMM	9
4 - Memooo	7
5 - M0ka	7
6 - AHmed	6
7 - Ahmeed	6

o	o				
x	x				
o	o				
x	x	x			
x	o	o			
x	o	x			

```
Player 1 Moves: 8      Player 2 Moves: 7
player 1 score: 0      Player 2 score: 0
```

Enter your move:

9-References:

<https://stackoverflow.com/questions/24696113/how-to-find-text-between-two-strings-in-c>

<https://stackoverflow.com/questions/40949545/file-path-as-user-input-in-c>

https://www.qnx.com/developers/docs/7.0.0/#com.qnx.doc.neutrino.lib_ref/topic/f/fseek.html

<https://learncplusplus.org/how-to-read-an-xml-file-in-a-c-program-or-c->

[app/#:~:text=How%20to%20read%20an%20XML%20file%20in%20a%20C%20program,line%20of%20this%20XML%20file.&text=These%20are%20simple%20applications%20to%20read%20XML%20files%20in%20a%20C%20program](https://learncplusplus.org/app/#:~:text=How%20to%20read%20an%20XML%20file%20in%20a%20C%20program,line%20of%20this%20XML%20file.&text=These%20are%20simple%20applications%20to%20read%20XML%20files%20in%20a%20C%20program)