

Pranshu Gupta, Rhythm Das & Abhishek Jain  
SUMMER PROJECT 2014  
Programming Club IIT KANPUR

THE RENJUGAME

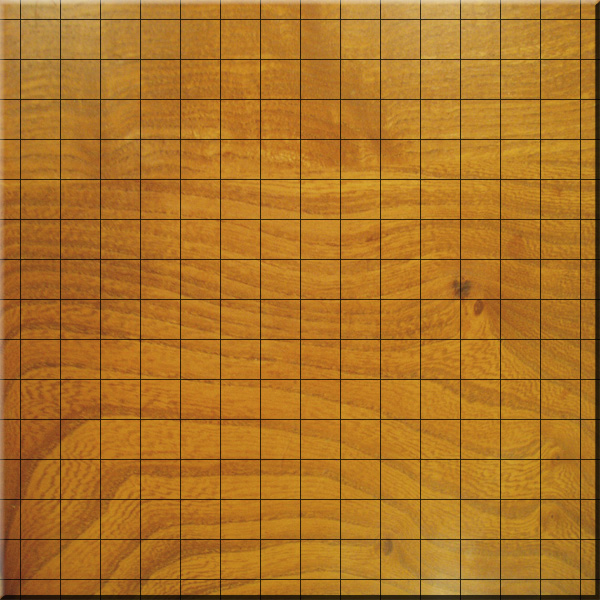
# WHAT IS RENJU

**RENJU** is the professional variant of GOMOKU, a strategy board game originating in Japan. The game is played on the 225 intersections of 15 horizontal and 15 vertical lines. Two players, Black and White, move in turn by placing a stone of their own color on an empty intersection, henceforth called a square. Black starts the game. The player who first makes a line of five consecutive stones of his color (horizontally, vertically or diagonally) wins the game. The stones once placed on the board during the game never move again nor can they be cap- turned. If the board is completely filled, and no one has five-in-a-row, the game is drawn. Renju eliminates the "Perfect Win" situation in Gomoku by adding special conditions for the first player (Black).

Black can win the game only by placing five black stones in a row (vertically, horizontally or diagonally).

White can win by either:

* Getting five (or more) white stones in a row
* Forcing Black to make a forbidden move, such as six in a row.





# THE PROJECT

* Our objective is to develop the Renju game which is built with the use of ARTIFICIAL INTELLIGENCE and runs in a GRAPHICAL USER INTERFACE.
* We will be using MINIMAX and ALPHA BETA PRUNING for developing the AI part and WXPYTHON along with PYGAME libraries for the gaming and GUI part.
* We will be posting our codes on GITHUB. The link for the same is

<https://github.com/Pranshu258/Renju>

You can learn about GITHUB and how to use it from the book Pro-Git. Which can be downloaded from

<https://github.s3.amazonaws.com/media/progit.en.pdf>

# RESOURCES

* For video lectures on PYTHON, WXPYTHON and PYGAME we referred to : <http://thenewboston.org/tutorials.php>
* For python you can also go to : <http://www.tutorialspoint.com/python/>
* The following webpage has description of minimax implementation in a Tic-Tac-Toe game: <http://www.neverstopbuilding.com/minimax>
* This one provides a good understanding of minimax and alpha beta pruning: <http://web.cs.wpi.edu/~rich/courses/imgd4000-d09/lectures/E-iniMax.pdf>
* Other informative pages are: <http://www.cs.cornell.edu/courses/cs312/2002sp/lectures/rec21.htm>

# THE PROJECT TIMELINE

## DATE DESCRIPTION

|  |  |
| --- | --- |
| 17 May 2014 | Cleared python basics from the following links:  <http://thenewboston.org/list.php?cat=36>  <http://www.tutorialspoint.com/python/index.htm> |
| 18 May 2014 | Learnt about PYGAME and WXPYTHON libraries from the following links:  <http://thenewboston.org/list.php?cat=42>  <http://thenewboston.org/list.php?cat=20>  <https://www.youtube.com/watch?v=Y7joZ67mC6o&list=PLQVvvaa0QuDcxG_Cajz1JyTH6eAvka93C> |
| 19 May 2014 | Created two basics games, here is the link to the GITHUB repository:  <https://github.com/Pranshu258/Renju/blob/master/game.py>  <https://github.com/Pranshu258/Renju/blob/master/game2.py>  One of them is something like the flappy bird and the other one is a somewhat a shooting game. Just to have some practice with the PYGAME library. |
| 20 May 2014 | Added conditions for and introduced obstacles in the flappy bird game. The updated version is available at:  <https://github.com/Pranshu258/Renju/blob/master/game.py> |
| 21 May 2014 | Designing the UI window of the game using WXPYTHON. Trying to integrate the PYGAME and WXPYTHON processes. The GITHUB link for the code is:  <https://github.com/Pranshu258/Renju/blob/master/Renju.py> |
| 22 May 2014 | Added a background image to along with buttons to start the PYGAME process in WXPYTHON window.  Writing the code for detecting the point on the RENJU at which the player clicks and placing the black/white stones at the nearest intersection of lines(as per the players turn).The code is within Renju.py  <https://github.com/Pranshu258/Renju/blob/master/Renju.py> |
| 23 May 2014 | All the stones that have been put are not being displayed, only the last one, trying to find a way out. |
| 24 May 2014 | Reading 'Gomoku winning strategy by **L. V. Allis**, the paper can be downloaded from the following link:  <https://chalmersgomoku.googlecode.com/files/allis1994.pdf> |
| 25 May 2014 | Removed the stone placing bug. We put the display update statement and the positions of images In a loop so that all of the stones were displayed. The link for the improved code is here:  https://github.com/Pranshu258/Renju/blob/8148d86dfb55374f03d6f374aaedb8bb6a1aeb86/Renju.py |
| 26 May 2014 | We added message boxes that would notify the player if he/she makes a wrong move and also tell if a player wins. Hence, giving a complete two player gaming experience. The link for the complete code is: <https://github.com/Pranshu258/Renju/blob/636b5cdfb18afb7a17cb62baad9038865bd129ec/Renju.py> |
| 28 May 2014 | Reading this:  <http://wenku.baidu.com/view/b14f39ee6294dd88d0d26ba7.html> |
| 29 May 2014 |  |
| 30 May 2014 |  |
|  |  |
|  |  |
|  |  |
|  |  |