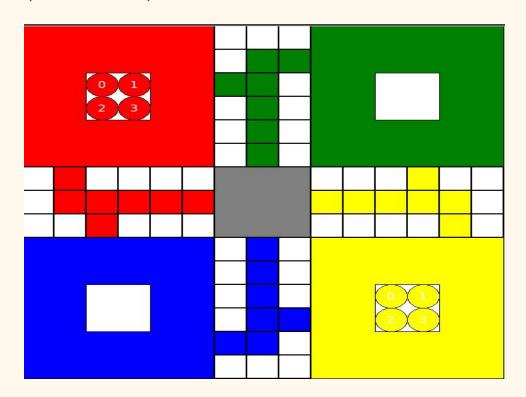# Design Document
Shakuni (Ludo-Bot)

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Overview

The goal of this project is to create an AI bot for Ludo. Uses heuristics based search (expecti-minimax with single ply) and TD Learning (added to branch rishab) for weight learning. We build our bot in python using tkinter library to render the board.
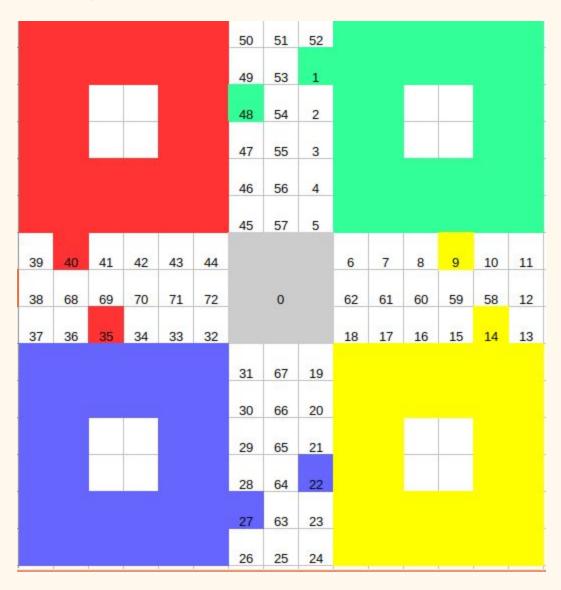
Board State representation

The state of the game is maintained by two dictionaries, with key being the colour, and value being the array storing the positions for each of the pieces. Two positions are maintained: Local (how many squares away from the starting square) and Global (square number on the board, as defined in Board.xlsx).

State
Player 1 Color
Player 1 token 1 position
Player 1 token 2 position
Player 1 token 3 position
Player 1 token 4 position
Player 2 Color
Player 2 token 1 position
Player 2 token 2 position
Player 2 token 3 position
Player 2 token 4 position

Board Representation

If the token is **not yet open** then position is kept as **-1** for that token.

Running the Bot

- No need to compile.
- Bot can be run by calling ludo.py. Running this from client would mean running client/client <ip address> <port no.> ludo.py