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TExas Hold’Em Poker



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# Analysis of the problem

### Summary of the project

Poker (Texas Hold’em Poker) is one of the largest card games in the world. Many casinos feature multiple tables and there are regular large tournaments played with professional players and large prize pools. The game is largely famous for various reasons: it is one of the few games where players will play and bet against each other, rather than playing against the casino (such as Blackjack). It is also famous because the game is not purely based on luck, nor is it solely based on skill, instead, in order to be good at the game, one must have a good ability to turn their luck (or lack of it) into results.

The game consists of 5 cards which all players ‘share’, with each player having 2 cards to themselves. The players will then bet against each other as the ‘shared’ cards get revealed, to see who has the best hand, which should be a total of 5 cards with at least one card from your hand.

However, I always have thought that learning the game proves extremely difficult, and what is even harder, is getting good at it.

My aim is to create a Texas Hold’em Poker game that will allow new players to develop their skills and learn the game, while also allowing experienced players to have a challenging opponent. I will do this by creating AI players at various difficulty levels so that stakeholders can choose the experience they desire. I will also be implementing a multiplayer feature that will allow stakeholders to play on multiple machines against each other. Furthermore, a key part of the program will be the Poker Tutor – a feature which can be turned on or off, and will guide novice players into making the right decisions by displaying odds and giving tips. Lastly, a tutorial feature will teach the basics of the game to any new player.

## 1.1 Problem Identification

### 1.1.1 Features that make the problem solvable by computational methods

One key feature of the program is the Poker Tutor, which has to calculate the probabilities of winning the hand at each turn and display them in a user friendly way. The Tutor must also use these probabilities to display suggested moves and tips that match any scenario.

In order to achieve this, the program must use all of the available data from the current hand and carry out multiple complex calculations. These algorithms therefore, require computational power since these methods would be time consuming and labour intensive.

Furthermore, the fact that players are able to play on different machines, means that a computational method is required. Players are able to play in the same game yet not be in the same place geographically which would be impossible to achieve without using a computational method.

### 1.1.2 Why the problem is amenable to a computational approach