The program is a three-card brag simulator. The simulations calculate the probability of winning based on the martingale strategy and anti-martingale strategy. The game of 3-card Brag has been around since the 18th century when it was considered to be one of the most popular British card games. The casino variant of Three Card Poker was first created by Derek Webb in 1994 and patented in 1997. Webb's goal was to develop a version of poker that played with the speed of other table games.

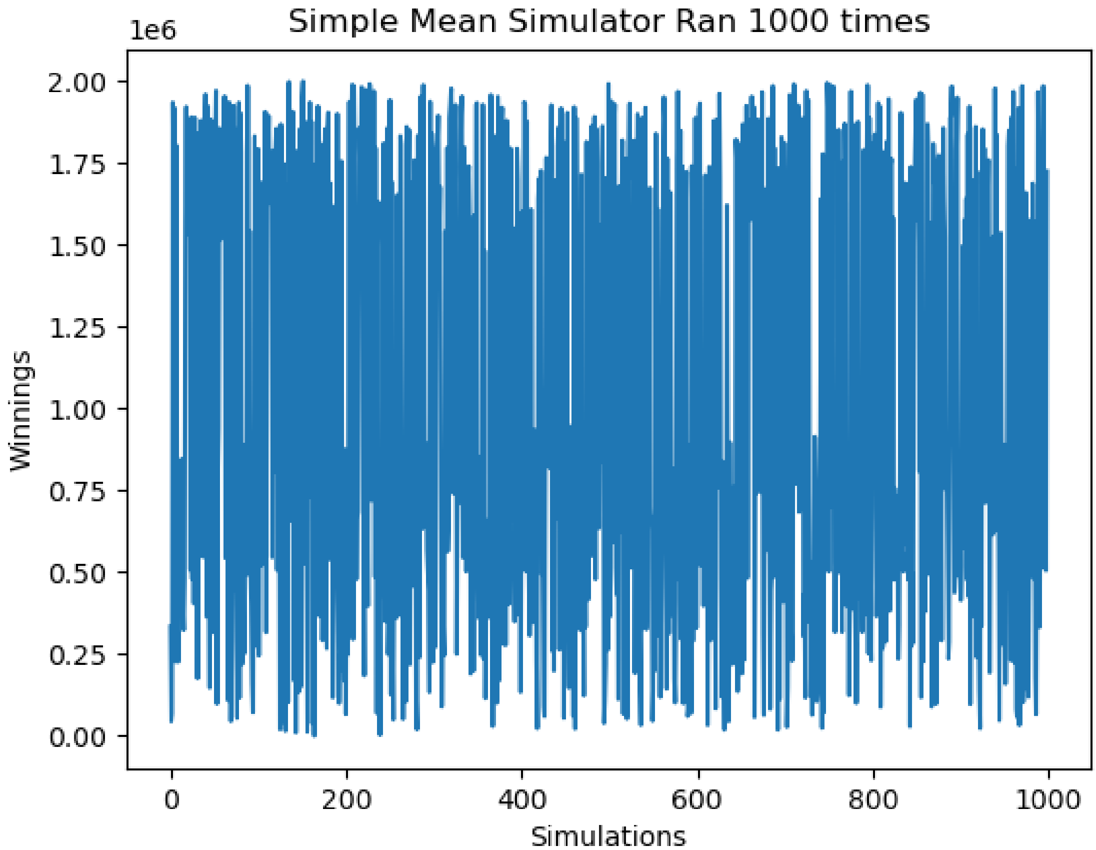
Before each deal, each player must place the initial stake in the pot. Then each player is dealt 3 cards face down. When the cards have been dealt, the betting begins with the player to the left of the dealer. This person can fold or can bet any amount from the agreed minimum to the agreed maximum. If any player bets, every player after that must either fold or bet at least as much as the previous player who bets. The betting continues around the table as many times as necessary. If all the players except one fold, the last remaining player takes all the money in the pot, and the next hand is dealt.

In this program, the player loses or wins solely based on the three cards in their hands. The best hand is called prial. Prial is short for pair royal. It is a three-of-a-kind, three cards of the same rank. The second to best hand is called a running flush. A running flush is a set of three consecutive cards of the same suit. A run is the third best hand. A run is a set of three consecutive cards of mixed suits. A flush consists of three cards of the same suit. The second to worst hand is a pair. A pair consists of two cards of equal rank. The worst hand has three cards that do not form any of the above combinations. These rank according to the highest card.

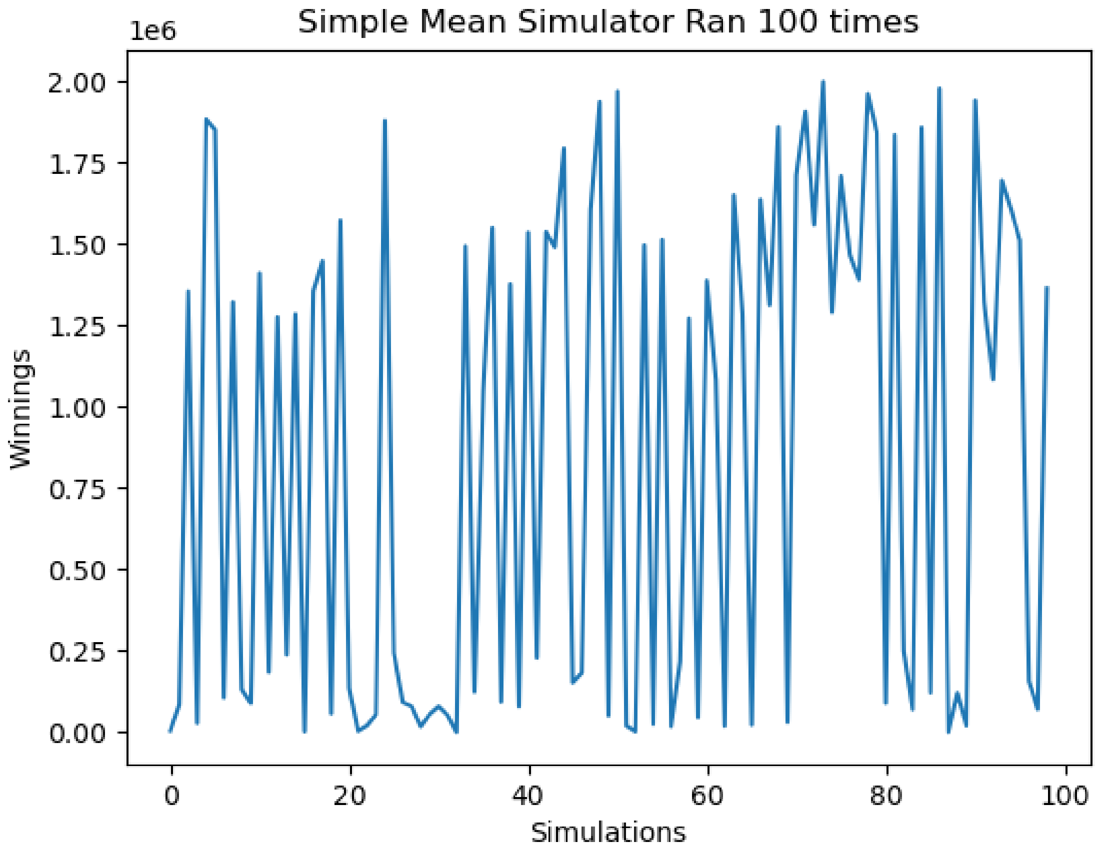
The Martingale strategy is a betting strategy that originated in 18th-century France.

In this strategy, the player doubles the bet after every loss, so that the first win would recover all previous losses plus win a profit equal to the original stake. Thus, this strategy excels at making money if the player has an unlimited amount of money.

In the anti-martingale strategy, bets are increased after wins and reduced after a loss. The deception is that the player will benefit from a winning streak, and reduce losses from a losing streak. Since the bets are independent of each other, the concept of winning streaks is an example of a player's misbelief. Thus, the anti-martingale strategy fails to make any money.



The graph above is a graph of 1,000 Simulations. It shows the winnings of player zero in dollars over the course of 1,000 simulations. For the simulation above, the betting amount started at 1 dollar. It would double every time player zero lost. Thus, the first win would recover all previous losses plus win a profit equal to the original stake. The simulation had two players, but the program is able to handle any number of players. A normal three-card brag game can have up to eight players. The player's wallet size is set to 1,000,000 dollars. This is the amount of money each player starts off with. The number of rounds is set to 1,000,000 rounds. This is to ensure that the game doesn't end halfway. We want to ensure there is a winner and the game ends. Player zero won 511 games out of 1000. The probability of winning with the Martingale strategy is 51.099999999999994%. On average, Player 0 ended up with 1006492.72 dollars after each game. That means that player zero made a profit of 6492.72 dollars. This is reasonable considering that this strategy is full proof that the player has an infinite amount of money. The player can lose 100 rounds, but eventually, the player will win a round. Since the bets are getting doubled after each round is lost when the player wins they will recover all previous losses plus win a profit equal to the original stake.



The graph above is a graph of 100 Simulations. It shows the winnings of player zero in dollars over the course of 100 simulations. For the simulation above, the betting amount started at 1,000 dollars. It would double every time player zero won, and it would half every time player zero lost. Thus, player zero will maximize profit while on winning streaks, and player zero will minimize loss while on losing streaks. The simulation had two players, but the program is able to handle any number of players. A normal three-card brag game can have up to eight players. The player's wallet size is set to 1,000,000 dollars. This is the amount of money each player starts off with. The number of rounds is set to 1,000,000 rounds. This is to ensure that the game doesn't end halfway. We want to ensure there is a winner and the game ends. Player 0 won 43 games out of 100. The probability of winning with the anti-martingale strategy is 43.0%. On average, Player 0 ended up with 870846.37 dollars after each game. That means that player zero had a loss of 129153.63 dollars. This is reasonable considering that this strategy isn't the best. This is because each bet is independent. Thus, winning or losing the previous round has no effect on the current round. Hot winning streaks and cold losing streaks are merely a gambler's blind disbelief. However, this strategy could be really effective while investing in stocks. As stocks usually keep rising or falling.

The goal of this program is to compare the martingale and the anti-martingale strategies. I created a three-card brag simulator to compare the strategies. However, the program I created cannot account for human-like logic. For example, it isn't able to read the other player's face and bluff. Also, it doesn't fold if it's dealt a bad hand. The program keeps betting until a player runs out of money.

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Both of the strategies performed well. However, the Martingale strategy outperformed the anti-martingale strategy by a large margin. A possible future implementation for this project is to allow players to be able to play blind. When a player plays blind, they do not look at their cards. However, their bets are doubled. Thus, they only place half the betting amount in the pot. Also, a memory can be inserted into the program. This memory lets the player remember the cards already used in the previous game, and place bets accordingly. I do not plan to work on this project beyond the class work.

This project is related to the class because it’s about probability, gambling, and comparing strategies to maximize profit and minimize loss. It’s similar to the American Roullete similar program made earlier in the semester. Also, this program and its strategy can be used to invest in stock. Anti-martingale strategy is the best for investing in the market because stocks usually keep rising or falling.

While compared to homework 4, 2.0 effort went into completing this project. In this project, first I had to implement the game and its rules. Then, I had to build a simulation for the game. Figuring out how to implement the Martingale and anti-martingale into the game was tricky. I was able to implement the strategies by ending the game when one player runs out of money.

This report has 1485 words.