Black Jack Simulation

* While looking through the data from 900,000 hands of blackjack, there had to be a way to better the odds through neural network or multiple linear regression.
* So the idea was to have the dealer bust (lose) and the player to stay at a certain level and hit when it is appropriate and ultimately win money. This was done with random cards.

1. The simulation tests the idea of the player staying when he reaches 12 points.
2. When a player’s hand is 12, if he hits there is a chance the play will receive a 10 point card and bust. The purpose of this simulation is to lower the chance of busting.
3. If a player’s hand is 11, he can hit without busting because the highest non-interchangeable card is valued at 10. This hand also has a higher possibility of getting blackjack versus busting.
4. Through the simulation, there are four decks of cards (52 \* 4 = 208) and set the value of Jack, Queen, King at 10 points and Ace is valued at 11 or 1 and it is shuffled randomly.
5. The sequence starts with the player and dealer receiving two cards that will be less than or equal to 11. At this point the player can ask for another card.
6. Player card examples:
   1. Example1: Player gets 3 and 4 and ask for another card and gets a jack (10 points) then the total is 17 and stays to give a chance for the dealer to bust.
   2. Example2: player gets 3 and 4 and receives another 4 equals to 11 at this point the player can still ask for another card and receives a queen at this point the player hits blackjack.
   3. Example3: player gets 5 and 7 it equals to 12 at this point if he asks for another and it’s a 10 point card he can bust (lose). So the plan is to stay at 12 and chance that the dealer will bust.
7. Dealer card examples:
   1. Example1: dealer gets a 10 and a 6 at this point the rule is that he has to hit and if he gets a 10 card he can bust
   2. Example2: dealer gets a 10 and a 6 he hits and gets a 5 he gets blackjack so if the player hits black jack too then it’s a push
   3. Example3: dealer gets 10 and 7 then he has to stay and at this point the player also lose if he stays at 12
8. I ran 900000 hands through the simulation and found through random hands 510354 wins, 69169 pushes, and 320477 loses.
9. The percentages for the player to win, push, lose if he stays at 12 and chance the dealer to bust.
   1. 56.71 percent chance to win
   2. 7.68 percent chance for a push
   3. 35.61 percent chance to lose

Also apart from this simulation I attempted to create a neural network with the actual data set of black jack hands.

The first time I ran the neural network it came out with a 44 percent accuracy which wasn’t good at all then I attempted to run it again and I believed it memorized the data and overfitted because it came back with a 100 percent accuracy.

The size of data I don’t think neural network is the best avenue. After some research I believe a classification in machine learning is the best way to find a result because it can identify which set of categories the new observation belongs to.