How to Lose Better at Blackjack

[redacted]

Blackjack is a popular casino game with relatively simple rules. It is widely agreed that the perfect Blackjack player has about a 49% chance of winning on average. Despite knowing this inevitability, Blackjack remains an exciting and fun game for professional gamblers and casual degenerates alike. For the serious players, there exist a handful of tables with prescribed decisions for every scenario. To achieve the perfect score of 49%, one must memorize only a few dozen rules. Because this is already well-known, optimizing for purely winning. Instead, I developed and tested multiple Blackjack regimes with simplicity in mind. I wanted to discover the right balance of losing as little as possible while also being able to stick to simple enough rules that I could achieve the necessary buy-in from my inebriated self at some point in the future.

Blackjack is played with a dealer and one or more players. Players bid on their hand before any cards are dealt. Each player as well as the dealer are dealt two cards face up, but the dealer's second card remains facedown until the end of the round. Each player's goal is for their cards to sum to 21, where face cards are worth ten and an Ace can be one or eleven. The player has two options: hit to request an additional card, or stay to keep one's current cards. If one goes over the 21 threshold, you bust and automatically lose. If you fall short of 21, your only options for winning are to have a higher hand than the dealer (without going over still) or for the dealer himself to bust. The dealer's pre-defined strategy is that he must hit on every hand until his cards sum to 17 or greater. There is a little variability in some specific circumstances, but they largely don't alter the gameplay or odds very much.

Blackjack has been well-studied, and the playbook for perfect Blackjack gaming is well known. In order to minimize your losses, you simply need to adhere to the playbooks. Since serious player will be well-aware of the ideal maneuvers as well as the futile long-term odds, I decided to create a simulation that will determine the most effective, simple strategy to play. Such a strategy would be useful to all players once they've lost track of time and how many free casino drinks they've had. The strategies I tested can be summarized by stopping point for hitting as well as whether I was considering the Ace to be high or low. I tested stopping points from 15 to 18 with each Ace option. I also tested the simplest of strategies for when an individual's degenerate gambling has completely gotten away: always staying no matter what.

I developed this code in the R programming language using the "dplyr", "stringr", and "prob" packages. I functionalized this process by building custom Shuffle, Deal, Hit, Dealer Behavior, and Your Behavior functions. The code builds a randomly-shuffled card deck using a pseudo-random number generator, and the it begins dealing cards in order. From there, based on which Blackjack strategy is being simulated, your simulated player either hits for another card or stays until the desired criteria. The dealer has similar (but stationary) behavior. For simplicity's sake, only simple one-player tables were simulated, and specific variations into rulesets were not explored. 200 hands were played at each table, and each strategy's simulation was replicated 10,000.

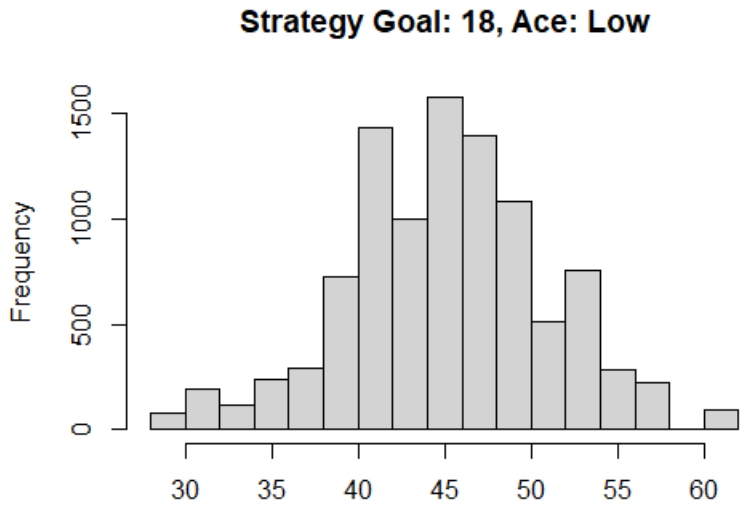
The results from this simulation were surprising. My highest win percentage came in at 62% by using a high stopping point of 18 and viewing every Ace as being high. In fact, all runs with a high Ace came well above the expected cutoff of 49%, so I determined something was wrong with this version of the process. While it is tempting to try to still use these numbers to make a relative comparison, there is

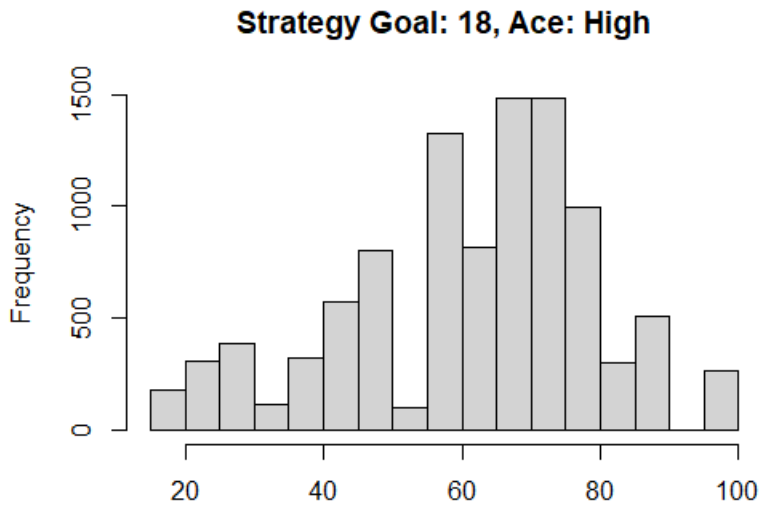
clearly something off with these simulations: they should not be trusted. I will, however, explore the low-Ace scenarios with healthy skepticism. Of these versions of the simulation, using a threshold of 17 to stop resulted in the highest win percentage of 47.3%. Always staying performed terribly at 37.8%.

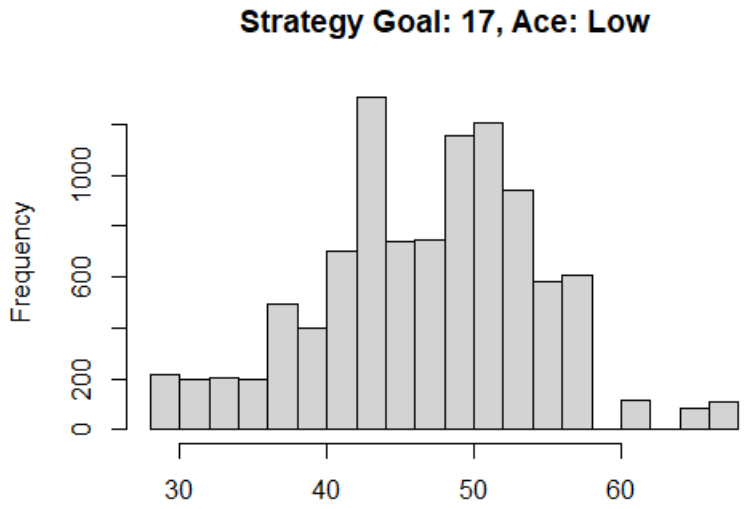
In summary, some very simple Blackjack strategies can be used effectively when one's memory is or other faculties are not functioning normally. In fact, simply copying the dealer's threshold of hitting until 17 provided the best method for minimizing losses. This makes sense, since the house does always win. In the future, it would be useful to explore how multiple players changes the dynamics as well as slightly different rulesets. A particularly interesting point of future study is the effect of splitting regimes on winnings.

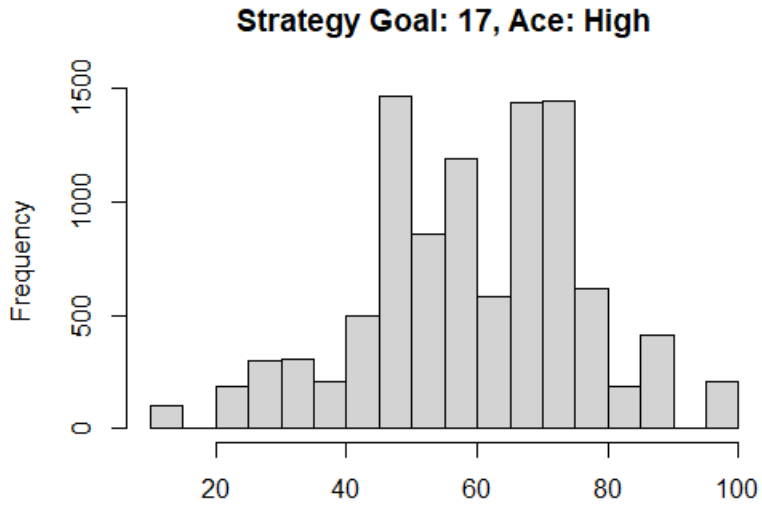
Table 1.

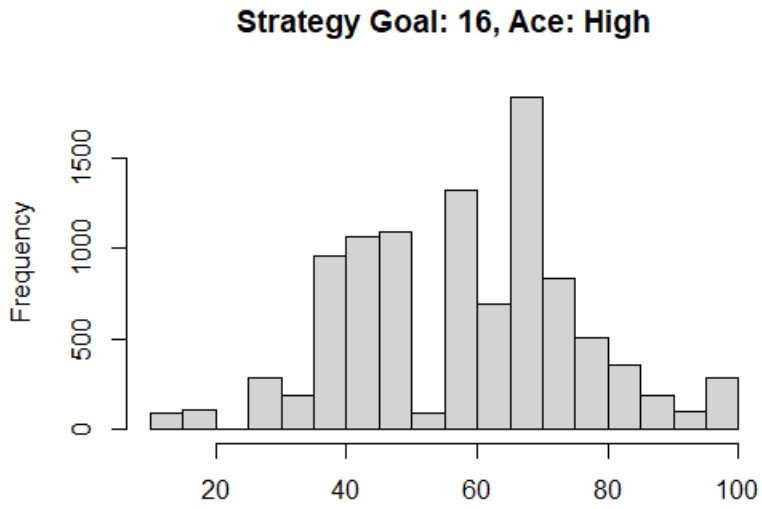
Stopping Point	Ace	Win %
18	1	45.6%
18	2	62.3%
17	1	47.3%
17	2	60.3%
16	1	47.3%
16	2	59.1%
15	1	46.9%
15	2	56.3%
Always Staying	1	37.8%


Strategy Goal: 18, Ace: Low
Frequency
0
500
1000
1500
30
35
40
45
50
55
60


Strategy Goal: 18, Ace: High
Frequency
0
500
1000
1500
20
40
60
80
100


Strategy Goal: 17, Ace: Low
Frequency
0
200
600
1000
30
40
50
60


Strategy Goal: 17, Ace: High
Frequency
0
500
1000
1500
20
40
60
80
100


Strategy Goal: 16, Ace: High
Frequency
0
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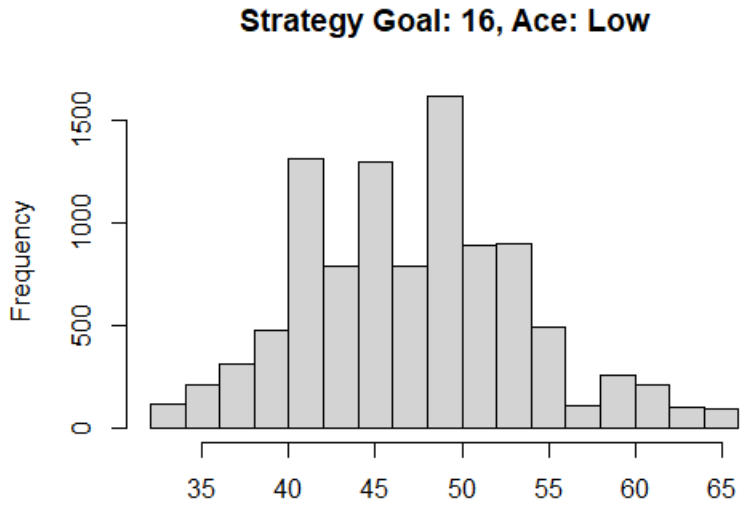
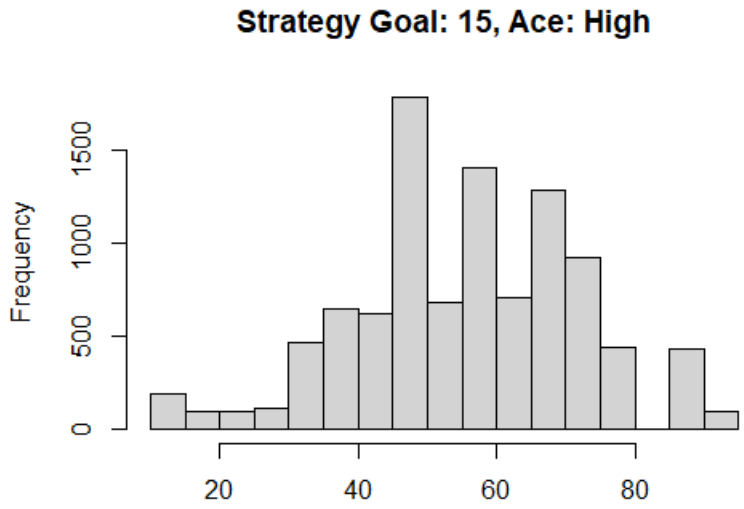
1000
1500
20
40
60
80
100


Strategy Goal: 16, Ace: Low
Frequency
0
500
1000
1500
35
40
45
50
55
60
65


Strategy Goal: 15, Ace: High
Frequency
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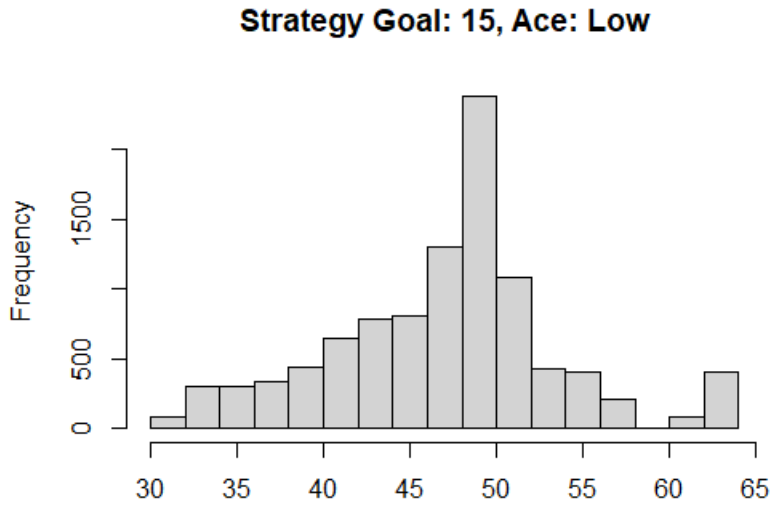
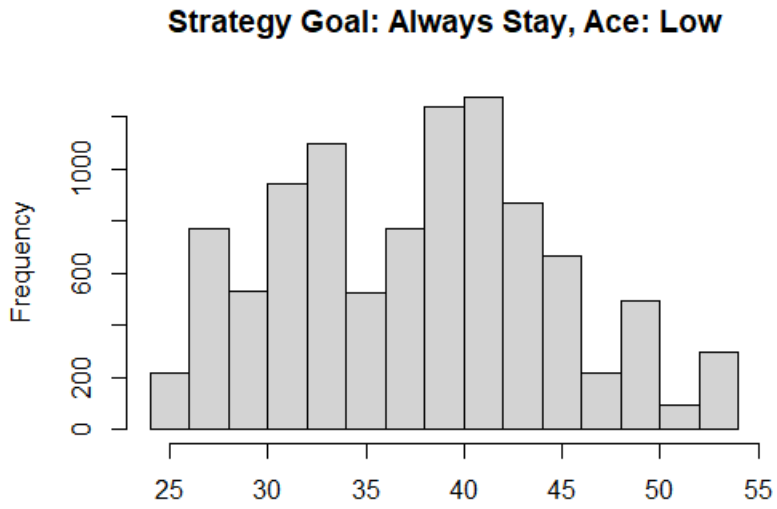
1000
1500
20
40
60
80


Strategy Goal: 15, Ace: Low
Frequency
0
500
1500
30
35
40
45
50
55
60
65


Strategy Goal: Always Stay, Ace: Low
Frequency
0
200
600
1000
25
30
35
40
45
50
55