Hannah Soria
CS231
Professor Wolfe/ Bender
2/21/2022

Project 1 Report: Monte Carlo Simulation: Blackjack

Abstract: In this project I created a simulation of when a game of blackjack is played out between the dealer and a player. The simulation returns what each player had in their hand, what their total was, and who won. This code is made up of different classes each in their own file: Card, Hand, Deck, Blackjack, and Simulation. Essentially, when the final class is run, which is the simulation, the game is played through 1000 times and the total player wins, dealer wins, how many were tied, and the percentage of each are returned. Through using classes, if statements, and for loops in java I gained a better understanding of all of these and a better understanding of working with java.

Results: My code runs correctly and returns the number of wins and the percentage for each: the dealer, the player and ties. The results make sense that they are random but the percentages of wins on either side are higher than the number of ties. This is because it is more likely for one to win than for them to achieve the same number. I struggled with getting the game to have the other win when one exceeds 21. To fix this I had to implement a fourth if statement in the game method for when the player goes past 21. When the simulation is run this is the output in the terminal:

Total dealer wins: 514
Percentage of dealer wins: 51.4
Total player wins: 410
Percentage of player wins: 41.0
Total ties: 76
Percentage of ties: 7.6

This is what is printed to the mygames.txt when the Blackjack class is run:

-1
The players hand total: 16
Contents of the hand: 10 6
The dealers hand total: 17
Contents of the hand: 7 8 2
1
The players hand total: 17
Contents of the hand: 7 10
The dealers hand total: 24
Contents of the hand: 5 10 9
-1
The players hand total: 25

Contents of the hand: 6 9 10
The dealers hand total: 14
Contents of the hand: 8 6

The dealer wins more than the player because when the player exceeds 21 the dealer automatically wins without having to draw or continue playing. Therefore statistically the dealer will have a higher percentage of wins.

Extensions: I did not complete any extensions.

References: I worked with Professor Wolfe, Professor Bender, and Gretchen Biegel. I also worked extensively with Meredith Green who is my tutor and Anna who was a Sunday night TA. Java also proved to be very difficult to understand and quickly use the syntax correctly. To combat this I also read a lot of resources online about the syntax for if statements and java methods.