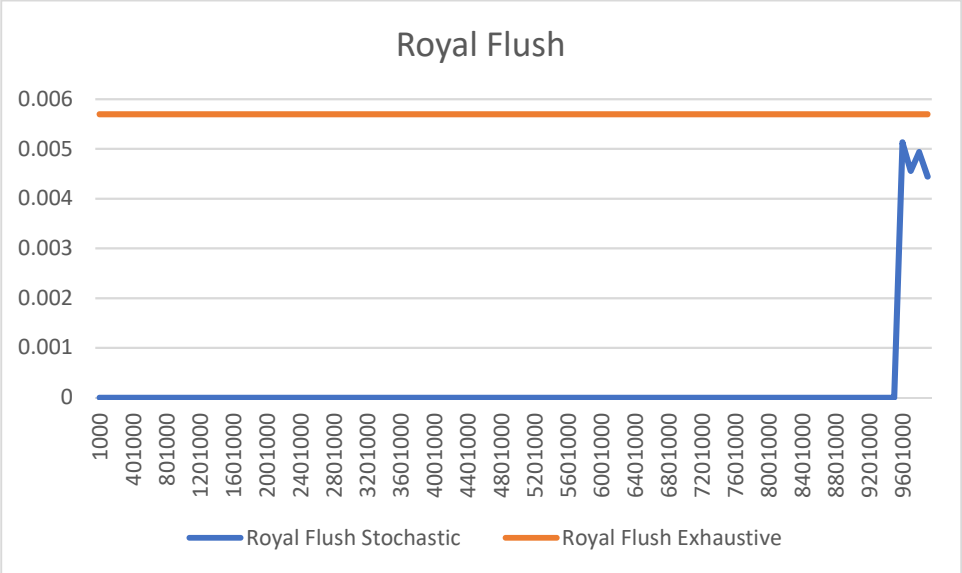
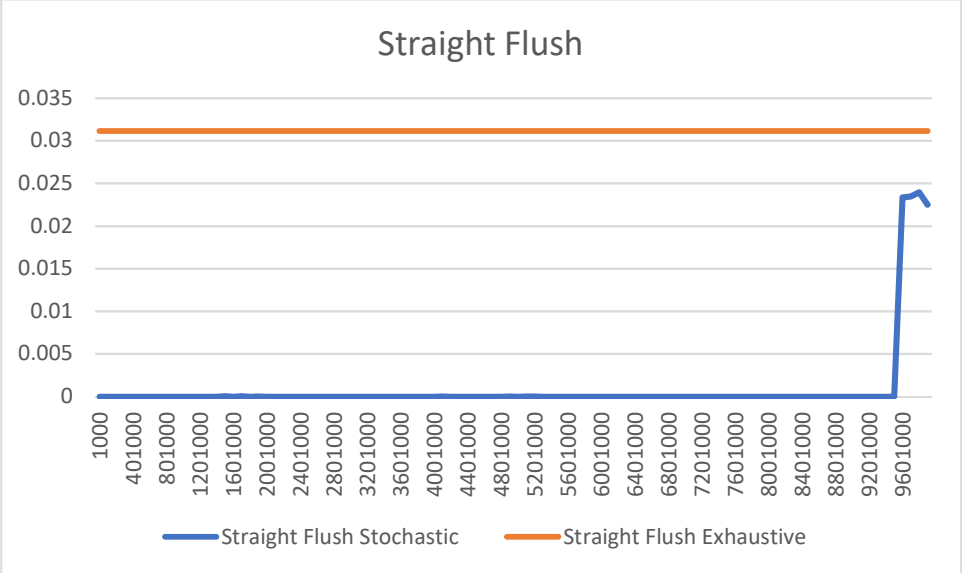
1. Overview of Project

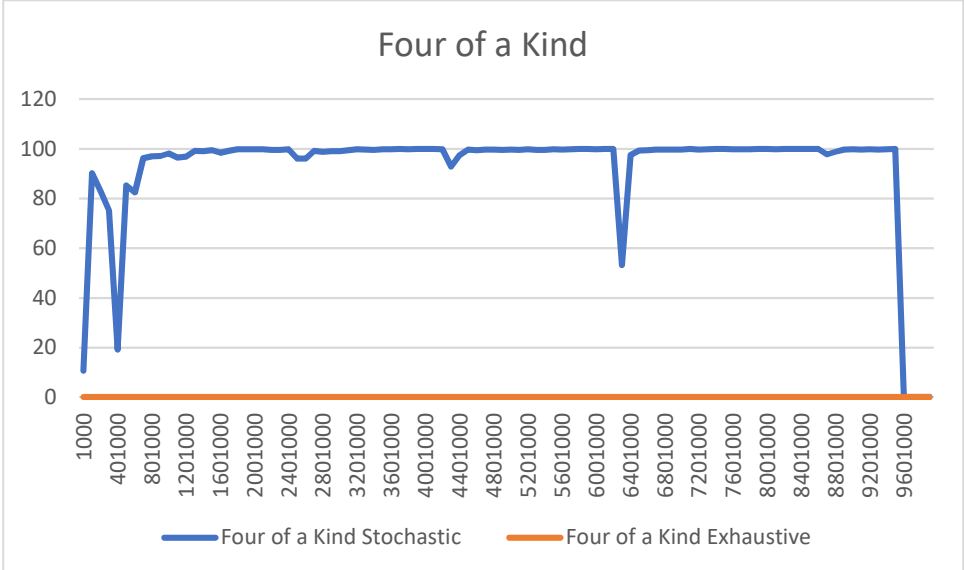
I learned how to create a random number generator and what a stochastic test was. I learned the different kinds of random number generators, sudo and real. I learned about masks in a random number generator.

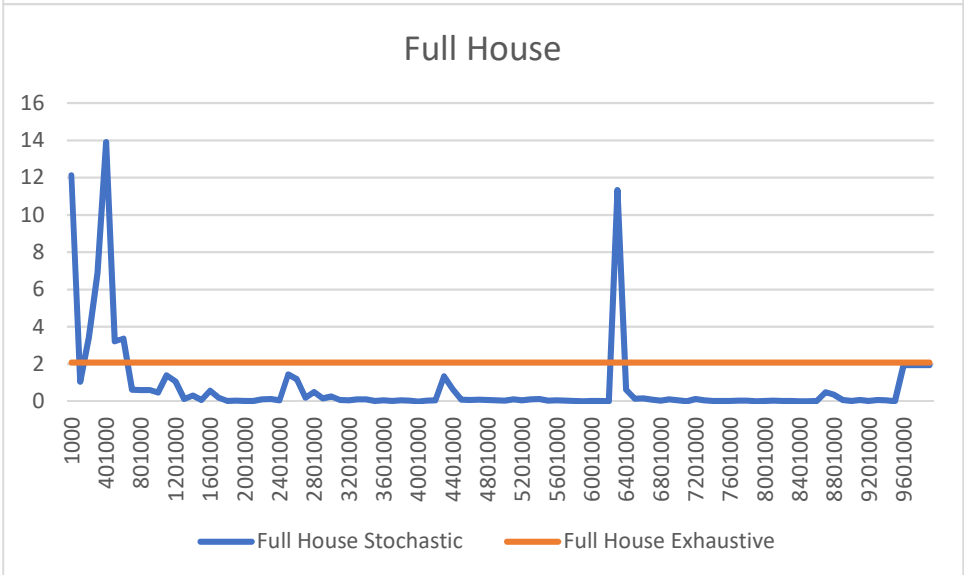
2. Timing and Graphs

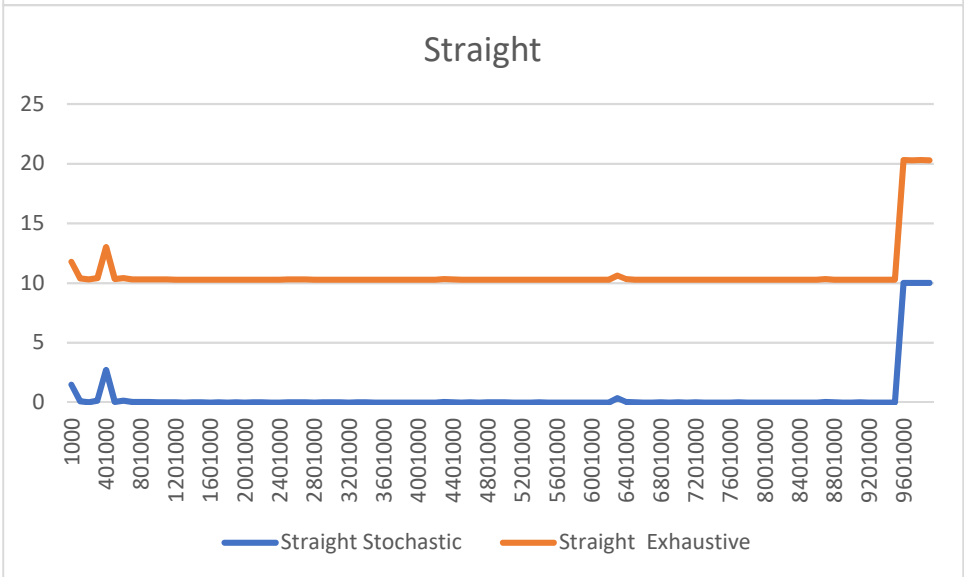
Show the Accuracy vs. Sampling Rate






Four of a Kind
120
100
80
60
40
20
0
1000
401000
801000
1201000
1601000
2001000
2401000
2801000
3201000
3601000
4001000
4401000
4801000
5201000
5601000
6001000
6401000
6801000
7201000
7601000
8001000
8401000
8801000
9201000
9601000
Four of a Kind Stochastic
Four of a Kind Exhaustive


Full House
16
14
12
10
8
6
4
2
0
1000
401000
801000
1201000
1601000
2001000
2401000
2801000
3201000
3601000
4001000
4401000
4801000
5201000
5601000
6001000
6401000
6801000
7201000
7601000
8001000
8401000
8801000
9201000
9601000
Full House Stochastic
Full House Exhaustive


Straight
25
20
15
10
5
0
1000
401000
801000
1201000
1601000
2001000
2401000
2801000
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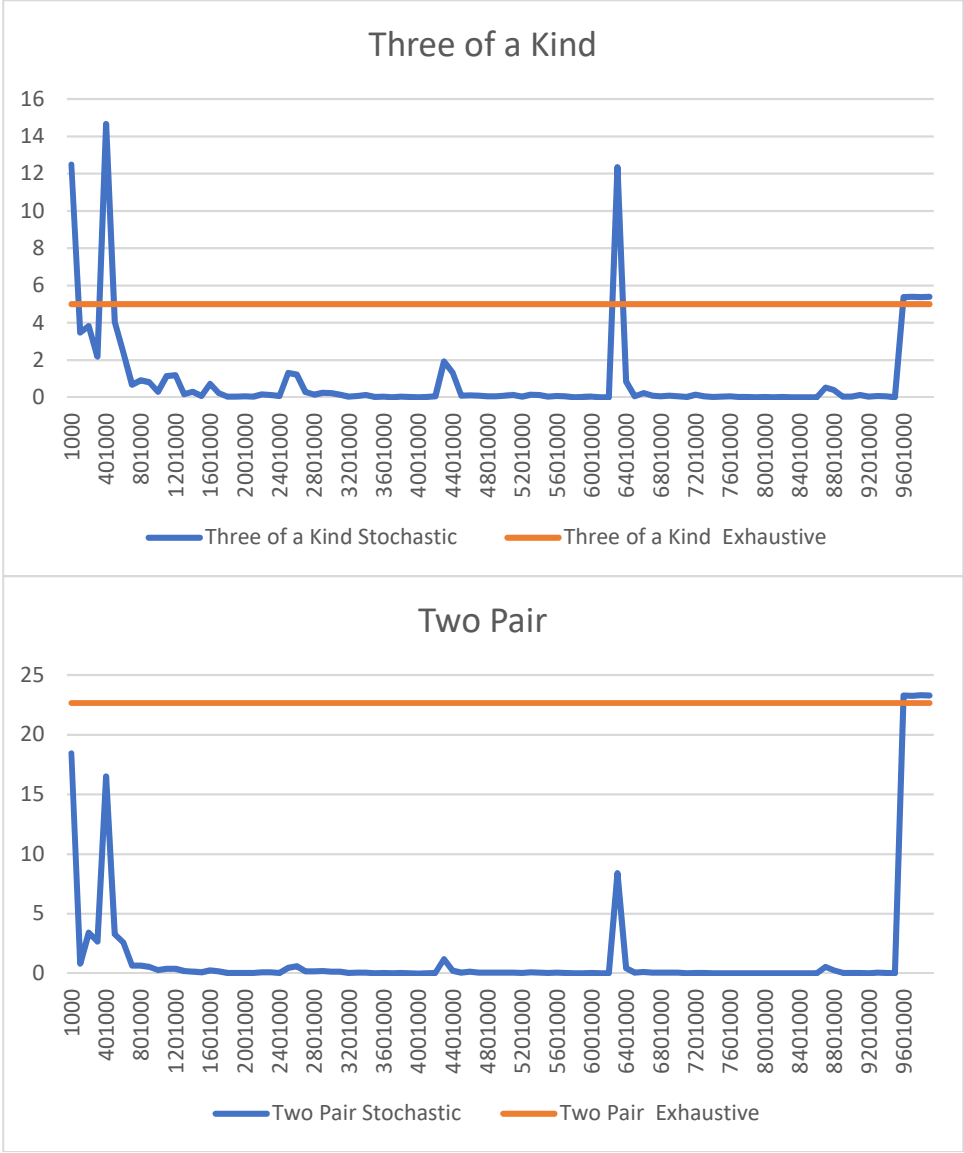
3601000
4001000
4401000
4801000
5201000
5601000
6001000
6401000
6801000
7201000
7601000
8001000
8401000
8801000
9201000
9601000
Straight Stochastic
Straight Exhaustive


Three of a Kind
16
14
12
10
8
6
4
2
0
1000
401000
801000
1201000
1601000
2001000
2401000
2801000
3201000
3601000
4001000
4401000
4801000
5201000
5601000
6001000
6401000
6801000
7201000
7601000
8001000
8401000
8801000
9201000
9601000
Three of a Kind Stochastic
Three of a Kind Exhaustive
Two Pair
25
20
15
10
5
0
1000
401000
801000
1201000
1601000
2001000
2401000
2801000
3201000
3601000
4001000
4401000
4801000
5201000
5601000
6001000
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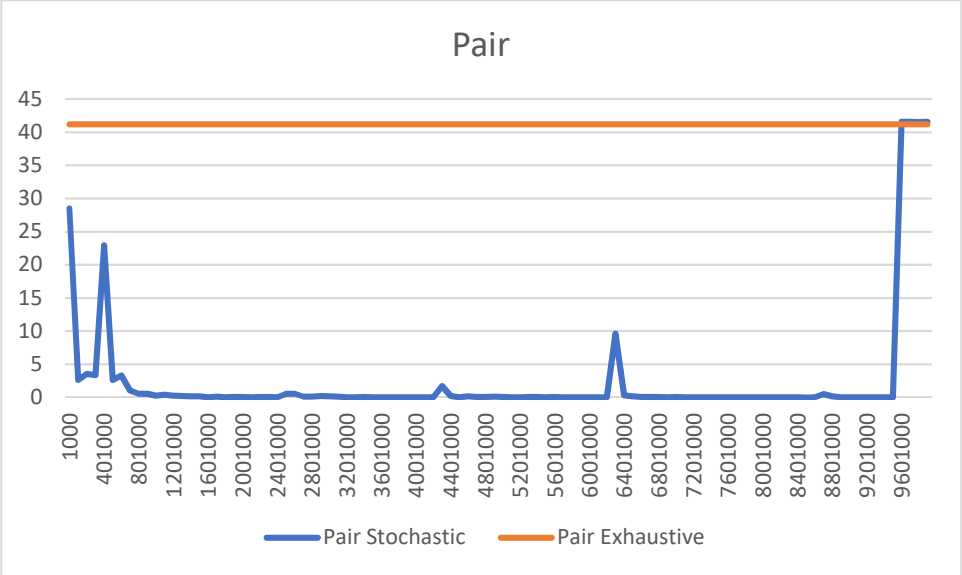
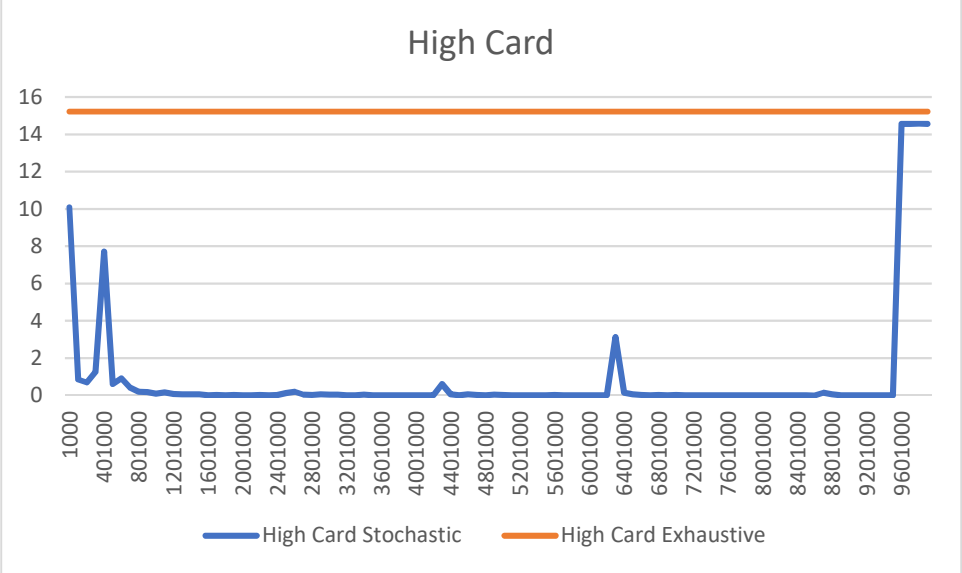
8801000
9201000
9601000
Two Pair Stochastic
Two Pair Exhaustive





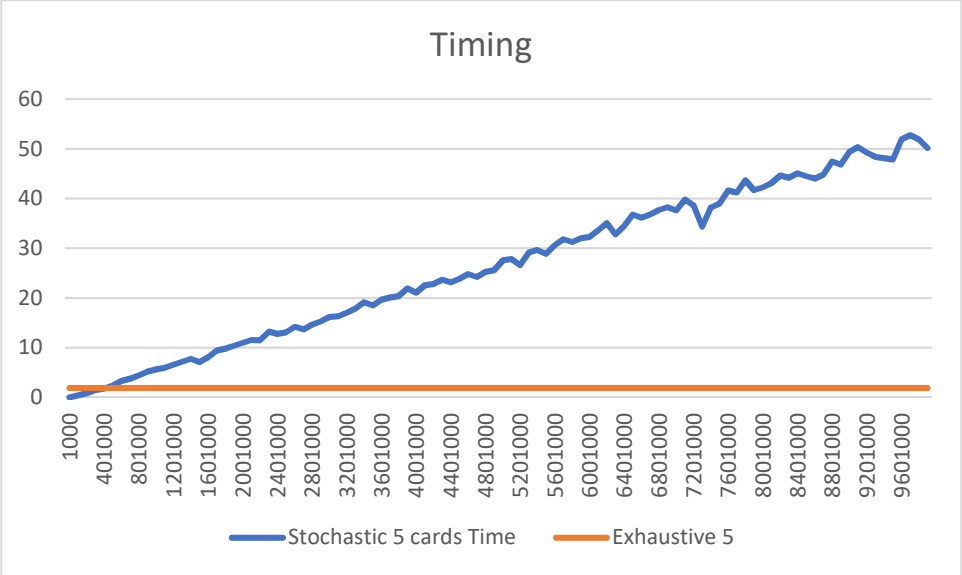
In your analysis document answer: What is the trade off in time vs accuracy? What would be a good trade off between accuracy and the time to compute the stochastic sampling?

The trade if us more time for the stochastic as the sample sizes get very large. Exhaustive is still very accurate and quick, stochastic taking much longer. However it is just as accurate.

How long would you expect it to exhaustively evaluate all 9 card hands? **Why?**

I would expect it to take about 30 minutes, based on the 7 card exhaustive taking only 10 minutes.

Time to Compute Stochastic Sample



3. Software Development Log

We spent about 5 hours on coding the tests, and then timing took about 5 hours. The most time-consuming part was the odds and the Hand ranks. Timing took a lot of time to run, but that was expected. We probably could have done a better job of allocating time for this.

4. Texas Hold'em Analysis

If you did the Texas Hold'em Analysis, answer these questions:

Texas Hold’em is a interesting game. I have played it quite a bit, but never realized how small the chances were for the bigger hands.

What are the top 10 **best** 2 card hands you can be dealt in Texas Hold'em? Rank them by their winning percentages.

How often does Ace,Ace beat King,King. How often does Ace, Ace beat Ace, King. How often does Two, Eight beat Ace, Ace?

How many samples did you have to make (how many hands where dealt for each 2 card combination) to compute a valid probability of winning for those 2 cards? Justify this number of samples! (A graph would be useful here.)

Add a table to the back of this document (don't count it against your 2 pages) which shows the chance to win when dealt any two initial cards (where the first card can be any Spade from 2 to Ace, and the second card can be any other Spade or any Heart). List these in order from most probable win to least probable win (which will require sorting...).

5. Thought Problems

The random number generator is very important, as a bad one will always compare the same hands. In order to get accurate data, you need to test as many different hands as possible. The best generator method had a diverse set of numbers, while the worst had almost 100% of the same numbers. When running the stochastic methods using mine and then javas, there isn't too much of a difference. Mine is simply less accurate, not as diverse numbers.