Corrections on Aurelia Miller's Texas Hold 'em Paper
and
Corrections on Aurelia Miller's Extra Paper

Corrections on Aurelia Miller's Texas Hold 'em Paper

1 Title Page

1. Your name should be on the title page. Is this paper by you or by the group? I think its my you since later you say things like *I spend the summer of 2026...*.

2. After your name you should have

   Mentored by Oliver Andrew and William Gasarch

3. The title *Final Report Pokerbot Project*

   does not tell the reader its about Texas Hold 'em.

   How about

   A Program for Betting in Texas Hold 'em

4. Great Picture!

2 Introduction

Under the tutelage of Dr. Gasarch should be
Under the guidance of Mr. Andrew and Dr. Gasarch

3 The Assignment

1. You should have a section explaining how Texas hold 'em works before this section.

2. The phrase *Dr. Gasarch* appears a lot. The paper should be on the work, not about how I ran the project. For example, Exhibit 1 is VERY GOOD but should be written as

   Here was our assignment:

4 Key Elements...

1. If its EASY to put the pre-flop chart in the appendix, then do so. If not then just give some examples of how 2-cards were rated.

2. You say you were instructed to not take into consideration what other people did. That was true. You should say in parenthesis

   "we added that feature later"

3. What does $nCr(n,k)$ represent? I thought it was $n\binom{n}{k}$ but I am not sure. You should say what it represents.

5 Future Enhancements

You need to have some kind of conclusion section before this section. You ran your program against each other. Here are what I think are some of your conclusions. You can edit or add to them.

1. The most important one: it is possible to write a decent Texas Hold 'em program!

2. Playing them against each other you found that that FILL THIS IN

   Did you find that some programs always did better Or were they about the same?

3. Taking into account what other players are doing increases how good the program does (I assume this is true.)

Corrections on Aurelia Miller's Extra Paper

1. Define what $nC(n,k)$ using the more familiar $\binom{n}{k}$ notation.

2. The paper needs a short introduction:

   Poker is played with a deck of 52 cards. Each card has a rank in the set $\{1,\ldots,13\}$ *(using Jack=11, Queen=12, King=13) and four suites (*♠*,* ♣*,* ♡*,* ♢*.) The probabilities for the various 5-card hands are well*

known. We look at what happens if there are r ranks and s suits. We are particulary interested in cases where the comparison of hands changes depending on r and s. For example:

GIVE AN EXAMPLE

3. The first graph which is Four of a kind vs Full House. I think you can show that the number of four-of-a-kind hands is greater than the the number of full-house hands using alegebra, so the graph is not needed.

4. I don't understand the graphs. For each one (a) see if they are needed or if algebra will tell us what we want to know and (b) for the graphs that you keep explain what they tell us.

5. I just noticed there are no page numbers so I need to refer to a place in the paper some other way.

6. Look at:

   5. Note that the three hands Straight Flush, 4-of-a-kind, Full house have no obvious order. So its plausible that any order could happen.

   This is not true- you just showed that 4-of-a-kind is always more likely than Full House.

7. You sometimes write *four of a kind* and somtimes write *4-of-a-kind*. You should be consistent. I prefer 4-of-a-kind.

8. Look at

   Flushes and Full Houses can tie in probablilty when there are 5 ranks and 2 suits

   If there are 2 suits then you can't have a full house since the 3-of-a-kind needs 3 suites.

9. Code should be in the appendix.

10. Appendix A- when you list the orderings that are possible you should use

    4-of-a-kind instead of *Four of a Kind*

    and

    3-of-a-kind instead of *Three of a Kind*

since might make you get an ordering on a line.

11. Sanity Check: Looking at the orderings in Appendix A some I wonder if they really could appear. Having NO pair should be very common. In many of the orderings its in the middle.

    This leads to the next point.

12. For each ordering you should give an r, s where it happens. Check it yourself to make sure it works. You should only consider $s \geq 4$ so that 4-of-a-kind can happen. Does this make some of your orderings not possible?