UNIVERSITY OF VIRGINIA, DEPARTMENT OF COMPUTER SCIENCE

Basic Java 3 - Blackjack Analysis

Nada Basit and Mark Floryan

January 11, 2022

1 SUMMARY

The goal of this homework is to write a report comparing two distinct strategies for your blackjack player. The requirements for this report are enumerated below:

1. Construct at least two distinct strategies for player.
2. Run an experiment comparing how well each strategy plays blackjack.
3. Write a report summarizing and analyzing your findings.
4. **FILES TO DOWNLOAD:** None
5. **FILES TO SUBMIT:** BlackjackAnalysis.pdf

1.1 PERFORMING AN EXPERIMENT

Your first task is to write (if you haven't already) **two unique** blackjack players that incorporate different strategies. You should be able to argue that the two strategies are significantly different AND that it is not obvious to you which is better. You should be geniuinely curious which approach will succeed.

You should then do the following:

- Run each of your two players for 10000 hands in the simulator. Run this simulation 10 times, and calculate the average and standard deviation of the results.
- Which bot does better? Why do you think this is? Does one have a higher average but also higher standard deviation? If so, why?

1.2 Report

Summarize your experiment and your findings in a report. Make sure to adhere to these general guidelines:

- Your submission MUST BE a pdf document. You will receive a zero if it is not.
- Your document MUST be presented as if submitted to a professional publication outlet. You can use the template posted in the course repository or follow Springer's guidelines for conference proceedings.
- You should write your report as if it is original novel research.
- The grammar / spelling / professionalism of this document should be sound.
- When possible, do not use the first person. Instead of "I ran the code 60 times", use "The code was executed 60 times...".

In addition to the general guidelines above, please follow the following rough outline for your paper:

- **Abstract**: Summarize the entire document in a single paragraph
- **Introduction**: Present the problem, and provide details regarding the two strategies you implemented.
- **Methods**: Describe your methodology for collecting data. How many hands, how many executions, how you averaged things, etc.
- **Results**: Describe your results from your execution runs.
- **Conclusion**: Interpret your results. Which strategy was better? Why was it better? Were you surprised? Was one strategy better in some situations and not in others? Why do

you think that is? Notice that I'm not looking for a particular answer here. Show me that you can interpret what happened when you ran your code.

Lastly, your paper MUST contain the following things:

- A table (methods section) summarizing the different experimental groups and how many execution runs were done in each group.
- A table (results section) summarizing each experimental group and the averages / std. dev. for each (as well as any other data you decided to collect).
- Some kind of graph visualizing the results of the table from the previous bullet.