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For Use in CS6460, CS6750, and CS7637

Author Name  
username@gatech.edu

***Abstract—***Welcome to Joyner Document Format (JDF) v2.2! JDF is primarily intended to standardize page lengths while ensuring readability. Note that you are required to use JDF for all written assignments,

# introduction

All text in JDF should be set in the Palatino typeface. It is available practically everywhere as a system font: Microsoft ships a version called *Palatino Linotype,* and Apple uses a version simply called *Palatino.* Those without either can look for “Book Antiqua” in their fonts list or download [TEX Gyre Pagella](https://www.ctan.org/tex-archive/fonts/tex-gyre/opentype) from CTAN. They all come in regular and bold weights with matching italics.

# experiments

The experiments consist of two sections. First experiment assumed that user will not go bankrupt while the second experiment was designed in such a way that the game will stop once user has no money left.

## Exeriment 1

Describe about the experiment

### Question 1

To compute the probability of winning $80 after 1000 sequential bets, Figure 1 simulation shows that all three episodes would render $80 even before 1000 spins. In fact, all three episodes converged to $80 at 174 spins.

A graph of a graph

AI-generated content may be incorrect.

1. Make sure your flowcharts are more useful than this one. Source: [XKCD](https://xkcd.com/1195/).

All of three episode results are $80 after 1000 spins. Thus probability of winning $80 after 1000 sequentials are 100% if we use the model 1

### Question 2

Expected value of experiment is $80. Expected value of experiments can be calculated using the function . If we compute number of winning value at 1001 sequentials, all three of them are $80. Thus 100% \* $80 will give us the expected value of $80.

### Question 3

The standard deviation represents the risk of the bets. High standard deviation means that values of at each episodes fluctuates widely. As shown in the table 1, high standard deviation is due to outlier value.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Spin No. | **std\_dev** | **Mean** | **Episode1** | **Episode2** | **Episode3** |
| 127 | 242.37 | -108.33 | 70 | 56 | -451 |
| 128 | 8.65 | 59.33 | 69 | 48 | 61 |
| 129 | 16.67 | 55.00 | 71 | 32 | 62 |
| 130 | 31.67 | 44.33 | 72 | 0 | 61 |
| 131 | 61.55 | 22.67 | 73 | -64 | 59 |
| 132 | 122.38 | -19.00 | 72 | -192 | 63 |
| 133 | 243.29 | -104.00 | 74 | -448 | 62 |

After standard deviation reaches maximum value at spin 133, it gradually stabilizes as number of spin increase. Since the Martingale strategy is to double the bet after every loss and probability of winning is 18/38, all of the episodes eventually reach $80. In our case of martingale strategy all episodes reach $80 at spin 174, which means that standard deviation becomes 0.

A graph of a graph

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## Experiment 2

In experiment2, number of episodes we simulate increases to 1000. And also, now there’s a bankroll. Each winning streak and losing streak will contribute to the bankroll. If bankroll reaches 0, simulation stops.

### Question 4

Since we carry over the $80 dollar to the last spins, we will be able to calculate how many times we have won the game within 1000 spins for all the 1000 epiosdes. Out of 1000 episodes, the simulator tell us that there are 359 cases where we have lost and 641 cases that the user has won the game. Thus, the probability of winning the bet is 64.1%.

### Question 5

We can calculate the expected value of the bet after 1000 spins using this function . If we combine the probability with the reward value $80 \* 64.1 % + -256 \* 0.359 , then the expected value of this bet equals -40. 62..

### Question 6

We can calculate the expected value of the bet after 1000 spins using this function . If we combine the probability with the reward value $80 \* 64.1 % + -256 \* 0.359 , then the expected value of this bet equals -40. 62..

## Additional elements

There are additional elements you may want to include in your paper, such as in-line or block quotes, lists, and more. For other content types not covered here, you have reasonable flexibility determining how it should be used in this format.

1. Mathematical constants. Notice how the approximations align at the decimal.

|  |  |  |  |
| --- | --- | --- | --- |
| Name | Symbol | Approximation | Description |
| Golden ratio | *φ* | 1.618 | Number such that the ratio of 1 to the number is equal to the ratio of its reciprocal to 1 |
| Euler’s number | *e* | 2.71828 | Exponential growth constant |
| Archimedes’ constant | π | 3.14 | The ratio between circumference and diameter of a circle |
| One hundred | A+ | 100.00 | The grade we hope you’ll all earn in this class |

### Quotes

If you would like to quote an outside source, you may do so in quotation marks followed by a citation. If a quote is fewer than three lines, you may write it in-line. It is acceptable to replace pronouns with their target in brackets for clarity. For example, “Heavy use of peer grading would compromise [the school’s] reputation” (Joyner, 2016). If a quote exceeds three lines, you should set it as its own paragraph with 0.5″ side margins, using the *Blockquote* paragraph style.

“Whether or not the grades generated by peers are reliably similar to grades generated by experts is only one factor worth considering, however. Student perception is also an important factor. […] Reliance on peer grading is one of the top drivers of high MOOC dropout rates. This problem may be addressed by reintroducing some expert grading where possible.” (Joyner, 2016)

### Lists

Bulleted and numbered lists are indented 0.25″ from the left margin, with the bullet or number hanging by 0.25″ (i.e., flush with the left margin).

* Like this
* And this
* And also this

# Procedural elements

## In-line citations

Articles or sources to which you refer should be cited in-line with the authors’ names and the year of publication.[[1]](#footnote-2) The citation should be placed close in the text to the actual claim, not merely at the end of the paragraph. For example: students in the OMSCS program are older and more likely to be employed than students in the on-campus program (Joyner, 2017). In the event of multiple authors, list them. For example: research finds sentiment analysis of the text of OMSCS reviews corresponds to student-assigned ratings of the course (Newman *&* Joyner, 2018). You may also cite multiple studies together. For example: several studies have found students in the online version of an undergraduate CS1 class performed equally with students in a traditional version (Joyner, 2018a; Joyner, 2018b). If you would like to refer to an author in text, you may also do so by including the year (in parentheses) after the author’s name in the text. If a publication has more than 4 authors, you may list the first author followed by ‘et al.’ For example: Joyner et al. (2016) claim that a round of peer review prior to grading may improve graders’ efficiency and the quality of feedback given. This applies to parenthetical citations as well, e.g. (Joyner et al., 2016).

## Reference lists

References should be placed at the end of the paper in a dedicated section. Reference lists should be numbered and organized alphabetically by first author’s last name. If multiple papers have the same author(s) and year, you may append a letter to the end of the year to allow differentiated in-line text (e.g. Joyner, 2018a and Joyner, 2018b in the section above). If multiple papers have the same author(s), list them in chronological order starting with the older paper. Only works that are cited in-line should be included in the reference list. The reference list does not count against the length requirements.

# References

1. Joyner, D. A., Ashby, W., Irish, L., Lam, Y., Langston, J., Lupiani, I., Lustig, M., Pettoruto, P., Sheahen, D., Smiley, A., Bruckman, A., & Goel, A. (2016). Graders as Meta-Reviewers: Simultaneously Scaling and Improving Expert Evaluation for Large Online Classrooms. In *Proceedings of the Third Annual ACM Conference on Learning at Scale*. Edinburgh, Scotland.
2. Joyner, D. A. (2017). Scaling Expert Feedback: Two Case Studies. In *Proceedings of the Fourth Annual ACM Conference on Learning at Scale*. Cambridge, Massachusetts.
3. Joyner, D. A. (2018a). Intelligent Evaluation and Feedback in Support of a Credit-Bearing MOOC. In *Proceedings of the 19th International Conference on Artificial Intelligence in Education*. London, United Kingdom. Springer.
4. Joyner, D. A. (2018b). Toward CS1 at Scale: Building and Testing a MOOC-for-Credit Candidate. In *Proceedings of the Fifth Annual ACM Conference on Learning at Scale*. London, United Kingdom. ACM Press.
5. Newman, H. & Joyner, D. A. (2018). Sentiment Analysis of Student Evaluations of Teaching. In *Proceedings of the 19th International Conference on Artificial Intelligence in Education*. London, United Kingdom. Springer.

# Appendices

You may optionally move certain information to appendices at the end of your paper, after the reference list. If you have multiple appendices, you should create a section with a *Heading 1* of “Appendices.” Each appendix should begin with a descriptive *Heading 2;* appendices can thus be referenced in the body text using their heading number and description, e.g. “Appendix 5.1: Survey responses.” If you have only one appendix, you can label it with the word “Appendix” followed by a descriptive title, e.g., “Appendix: Survey responses.”

These appendices do not count against the page limit, but they should not contain any information *required* to answer the question in full. The body text should be sufficient to answer the question, and the appendices should be included only for you to reference or to give additional context. If you decide to move content to an appendix, be sure to summarize the content and note it in relevant place in the body text, e.g., “The raw data can be viewed in *Appendix 5.1: Survey responses.*”

1. In-line citations are preferred over footnotes, and we favor APA citation format for both in-line citations and reference lists. Refer to the [Purdue Online Writing Lab](https://owl.purdue.edu/owl/research_and_citation/apa_style/apa_formatting_and_style_guide/in_text_citations_the_basics.html), or follow the above examples. You should use the *Footnote* paragraph style, with 8.5 point text and 14 point line spacing. [↑](#footnote-ref-2)