ALY 6050 Assignment 1: Betting Strategy Simulation Report

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Introduction

This report analyzes a betting strategy for a best-of-three and best-of-five baseball series between the Boston Red Sox and the New York Yankees. It evaluates expected net winnings and the probability of winning the series under different game order formats. The report uses theoretical probability and Monte Carlo simulation to assess if the strategy is financially favorable, and includes expected value, standard deviation, and confidence intervals.

Part 1: Best-of-Three Series (Boston, New York, Boston)

(i) Probability of Winning the Series

Using probabilities of 0.59 for a home win and 0.45 for an away win, we calculated the likelihood of Red Sox winning the best-of-three series in the given format.

Outcome	Probability	Net Winnings
Win in 2 games	0.2655	1515
Win in 3 games	0.2999	990
Lose in 2 games	0.2255	-1575
Lose in 3 games	0.2091	-1050

Expected Value (Mean of X): $413.70

Standard Deviation of X: $805.17

(ii) Monte Carlo Simulation Results (10,000 series)

Simulated Expected Value: $415.26

Standard Deviation: $798.20

95% Confidence Interval: [389.37, 441.15]

(iii) Evaluation of Betting Strategy

The betting strategy is slightly favorable when the series starts and ends in Boston.

Part 2: Best-of-Three Series (New York, Boston, New York)

The format is changed. The same probability logic is applied to a new game order.

Outcome	Probability	Net Winnings
Win in 2 games	0.2025	1515
Win in 3 games	0.3521	990
Lose in 2 games	0.2975	-1575
Lose in 3 games	0.1480	-1050

Expected Value (Mean of X): $-65.20

Standard Deviation of X: $790.46

95% Confidence Interval: [-88.53, -41.86]

Evaluation

When the series starts in New York, the betting strategy becomes unfavorable.

Part 3: Best-of-Five Series (Boston, New York, Boston, New York, Boston)

Simulated using RAND-based logic for each game and stopping at 3 Red Sox wins. 10,000 simulations were performed.

Simulation Results

Minimum Net Win: –2625

Maximum Net Win: 1515

Average Net Win: $110.66

Standard Deviation: $1059.61

95% Confidence Interval: [89.89, 131.43]

Discrete Frequency Distribution

Net Win	Frequency

-2625	5
-1595	910
-565	3483
465	3025
990	1394
1515	1183

Conclusion and Recommendation

Across all cases, expected net winnings were only positive when the series was structured to begin (and often end) in Boston. The Monte Carlo simulation aligns with theoretical expectations. The strategy is more favorable in the best-of-five format with Boston-heavy scheduling. In contrast, a New York-heavy schedule resulted in negative returns, making the strategy risky. Bettors should consider sequence and risk tolerance before adopting this approach long-term.

References

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