



# **ANALYZING BETTING STRATEGIES**

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## INSIGHTS:

1. The team who wins at least two games among the three games is the winner. The **probability of red sox winning the series** must be calculated. Given the scenarios where, the first game is won by Boston Red Sox, second game won by New York Yankees, third game won by Boston Red Sox.
  - a. Considering the above scenario, it is given in the question that the probability of Red Sox winning in their home ground Boston is 0.6, the probability of Yankees winning in their home ground New York is 0.57. To calculate the probability of Red Sox Boston winning in the first game if in case played in their home ground the value is 0.258 which comes the addition of the probability of Red Sox winning in their home ground Boston multiplied to the probability of Yankees not winning the game. Similarly, Game II, which is played in the New York, the probability of Red Sox winning the game is 0.2052, which is the probability of the red sox winning the game in Boston, multiplied, to the same, then further multiplied to the probability of Yankees winning the game in their home ground New York. In the third game the probability of the Red Sox Boston winning the game is the multiplication of the probability of red sox not winning the game twice times the probability of the Yankee's New York not winning the game which is equal to 0.1032. The result is 0.57.
    - i. Hence, the probability of the Red Sox Boston winning the series is 0.57.
2. The **probability distribution for the net win** considering the probability of Red Sox winning in their home ground Boston is 0.6, and the probability of Yankees winning in their home ground New York is 0.57, if the Red Sox, we win the bet of 500\$, if the Red Sox is lost, we lost the bet of 520\$. Expected mean when the first match is played in Boston is 92, expected mean when the second match is played in New York is 81.40, expected mean when the last match is played in Boston is 92. The average mean is 102.60, variance of the first, second and third matches are 249696, 255002.04 and 249696 respectively with the standard deviation of 868.5.
3. To find **the expected win by using 95% confidence interval**, generating random numbers for the bet numbers 500\$ and -520\$ i.e., the winning bet we get when the red sox win the series, and the money we lose when the red sox lost the series respectively. After generating the random numbers, the mean the standard deviation is calculated which is -38.16 and 878.1543 respectively, with the 95% confidence interval the range lies between the -55.40 and -20.95, the mean lies in between the range. With the frequency distribution table, the sample is uniformly distributed.

4. Considering the scenario where the team wins the game if in case two out of three games are won, to find **the probability of Red Sox Boston winning the series** where the first game is played in New York, second game played in Boston, and the third game played in New York. The probability of the red sox winning the first game is, the scenario is considered if the games are won consecutively by Red Sox, it is 0.43 and 0.6, next possible outcome is lost, win and win, which is 0.57, 0.6 and 0.43, next possible outcome is win, lost, win, which the probabilities would be 0.43, 0.4 and 0.43. The result would be 0.47902.
  - a. Hence, the probability of the Red Sox Boston winning the series is 0.57.
5. The **probability distribution for the net win** considering the probability of Red Sox winning in their home ground Boston is 0.6, and the probability of Yankees winning in their home ground New York is 0.57, if the Red Sox, we win the bet of 500\$, if the Red Sox is lost, we lost the bet of 520\$. Expected mean when the first match is played in New York is -81.4, expected mean when the second match is played in Boston is 92, expected mean when the last match is played in New York is -81.4. The average mean is -70.8, variance of the first, second and third matches are 255002.04, 249696, 255002.04 respectively with the standard deviation of 871.6077.
6. To find **the expected win by using 95% confidence interval**, generating random numbers for the bet numbers 500\$ and -520\$ i.e., the winning bet we get when the red sox win the series, and the money we lose when the red sox lost the series respectively. After generating the random numbers, the mean the standard deviation is calculated which is 480 and 721.2489 respectively, with the 95% confidence interval the range lies between the 465.86 and 494.136, the mean lies in between the range. With the frequency distribution table, the sample is uniformly distributed.

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