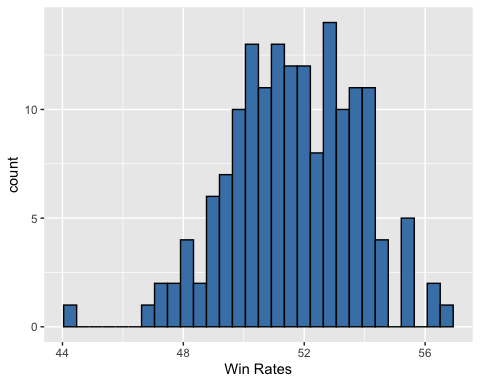
League of Legends is a 5 v. 5 multiplayer online battle arena (MOBA) game developed by Riot Games. In the game, players assume the role of a “champion” with unique abilities and battle against a team of other players or computer-controlled champions. Riot Games continually collects data to evaluate the effect of every champion, adjusting and fine-tuning various aspects associated with each champion, to ensure fair and competitive gameplay. Through various updates (patches) of the game that occur every two weeks, characters might turn out to be either extremely efficient and strong, or they might need adjustments to increase their abilities, as they are on the weaker side. Therefore, in order for an overall game balance to be achieved, developers use two common strategies, known as “nerfing” and “buffing”, within the world of video games. “Nerfing” is the act of reducing the power or effectiveness of a champion or item in a video game, while “buffing” is the act of increasing its power or effectiveness.

Patch 12.22 Win Rates

1. Indicate the observations (cases) of the data set for   
   patch 12.22.
2. Use the histogram to describe the shape, center, and spread   
   of Win Rates in patch 12.22.
3. Given summary statistics and the Champions with the five highest and five lowest Win Rates. Determine if there are any outliers present. Which player(s) might need buffing? Which player(s) might need nerfing?

|  |  |
| --- | --- |
| Mean | St. Dev |
| 51.66 | 2.097 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Min | Q1 | Med | Q3 | Max |
| 44.24 | 50.20 | 51.70 | 53.27 | 56.70 |

|  |  |
| --- | --- |
| Name | Win Rates |
| Fiddlesticks | 56.7 |
| Vi | 56.4 |
| Kled | 56.1 |
| Kog'Maw | 55.6 |
| Elise | 55.4 |
| Aphelios | 47.5 |
| Azir | 47.3 |
| Zeri | 47.2 |
| Pantheon | 46.7 |
| Sion | 44.2 |

After analyzing the data, the developers of the game released the 12.23 patch of League of Legends with new “nerfed” and “buffed” champions.

Patch 12.23 Win Rates

1. A picture containing screenshot, diagram, plot, pixel

   Description automatically generatedUse the histogram to describe the shape, center, and spread   
   of Win Rates in patch 12.23.
2. Suppose that the company took your suggestion from the previous analysis. Did the “nerf” or “buff” that you suggested work? Check by using the given summary statistics and the Champions with the five highest and five lowest Win Rates from Patch 12.23.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Min | Q1 | Med | Q3 | Max |
| 46.10 | 50.29 | 51.10 | 52.41 | 54.68 |

|  |  |
| --- | --- |
| Mean | St. Dev |
| 51.21 | 1.603 |

|  |  |
| --- | --- |
| Name | Win Rates |
| Vi | 54.7 |
| Elise | 53.5 |
| Fiddlesticks | 52.8 |
| Kled | 52.8 |
| Kog'Maw | 52.2 |
| Zeri | 51.1 |
| Sion | 48.9 |
| Azir | 47.5 |
| Pantheon | 46.7 |
| Aphelios | 46.1 |

1. Do you have any further suggestions for the company as they prepare for the next patch?
2. *(Optional)* How might you utilize the Pick Rate information in your analysis of Champions?