Assignment 3: Wordle Guess Distribution

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What is the mean associated with the wordle guess distribution?

The guess distribution is as follows:

$$\begin{aligned} 2 &: 17 \text{ times} \\ 3 &: 191 \text{ times} \\ 4 &: 172 \text{ times} \\ 5 &: 58 \text{ times} \\ 6 &: 16 \text{ times} \end{aligned}$$

The mean is calculated as follows:

$$\begin{aligned} \mu_{\text{guess}} &= \frac{2 \times 17 + 3 \times 191 + 4 \times 172 + 5 \times 58 + 6 \times 16}{17 + 191 + 172 + 58 + 16} \\ &= \frac{34 + 573 + 688 + 290 + 96}{454} \\ &= 3.703 \end{aligned}$$

Therefore, the mean associated with the wordle guess distribution is 3.703.

What is the variance or standard deviation of the guess distribution?

The variance and standard deviation is calculated as follows:

$$\begin{aligned} \text{Var}(X) &= E[X^2] - E[X]^2 \\ &= \frac{2^2 \times 17 + 3^2 \times 191 + 4^2 \times 172 + 5^2 \times 58 + 6^2 \times 16}{454} - 3.703^2 \\ \text{Var}(X) &= \boxed{0.751} \\ \sigma &= \sqrt{0.7508} = \boxed{0.866} \end{aligned}$$

What is the variance of the mean of the distribution? Or similarly, what is the standard error of the mean.

The variance of the mean and standard error of the mean is calculated as follows:

$$\begin{aligned} \text{Var}(\bar{X}) &= \frac{\text{Var}(X)}{n} \\ &= \frac{0.7508}{454} \\ &= \boxed{0.00165} \\ \text{SEM} &= \sqrt{0.00165} = \boxed{0.0407} \end{aligned}$$