Activities: Midterm 2 Prep

1. Open the novel Moby Dick and determine:
    a. the frequency of non-capital letters
    b. the frequency of capital letters
    c. the frequency of letters at the beginning of a word
    d. the frequency of letters at the end of a word.

2. Open the file Iris.csv and calculate the mean and variance of the sepal length for Iris-setosa as well as for Iris-virginica.

3. Use memoization to calculate the smallest number of stamps licked for an amount of n if the stamp denominations are 1, 7, and 9.

4. Use memoization to speed up the calculation of the numbers $(p_k)_{k \in \mathbb{N}}$ defined by:

$$p_0, p_1 = 1, \qquad p_n = \begin{cases} 2 \cdot p_{n/2} & \text{if } n \text{ is even} \\ 2 \cdot p_{(n-1)/2} + 3 \cdot p_{(n+1)/2} & \text{if } n \text{ is odd} \end{cases}.$$

For example, $p_2 = 2p_1 = 2$, $p_3 = 2p_1 + 3p_2 = 5$, $p_4 = 2p_2 = 4$, $p_5 = 2p_2 + 3p_3 = 2 + 5 = 7$. Calculate p_{100}.