Part 2 - Grammar

Reminders:

- **Alphabet** $\sum = \{ f, w, a, e, * \}$
- **Rules:**
  - The string must have only one * in the string that appears as the last character.
    - The smallest valid string is *.
  - If there are $f's$ and $w's$ in the string, then the combined length has to be odd.
  - If there are, $a's$ and $e's$ in the string, then the combined length has to be even.
    - Additionally, each run of a's and e's must be even in length, meaning they must be consecutively next to each other. For example, $aafeaaewf *$ is valid, but $afefeef *$ is not valid.

Formal Grammar:

$S \rightarrow XfXY \mid XwXY \mid aeXY \mid eaXY \mid aaXY \mid eeXY \mid Y$

$X \rightarrow aeX \mid eaX \mid aaX \mid eeX \mid wXfX \mid fXwX \mid fXfX \mid wXwX \mid \lambda$

$Y \rightarrow *$

Where:

- Alphabet $\sum = \{ f, w, a, e, * \}$
- Set of States $Q = \{S, X, Y\}$

Part 3 - Automaton