Wordle Solver

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Wordle: How to Play

- **Guess the Wordle in 6 tries**
  - Each guess must be a valid 5-letter word
  - Color of tiles will change to show how close your guess was to the word

Examples

W is in the word and in the correct spot.

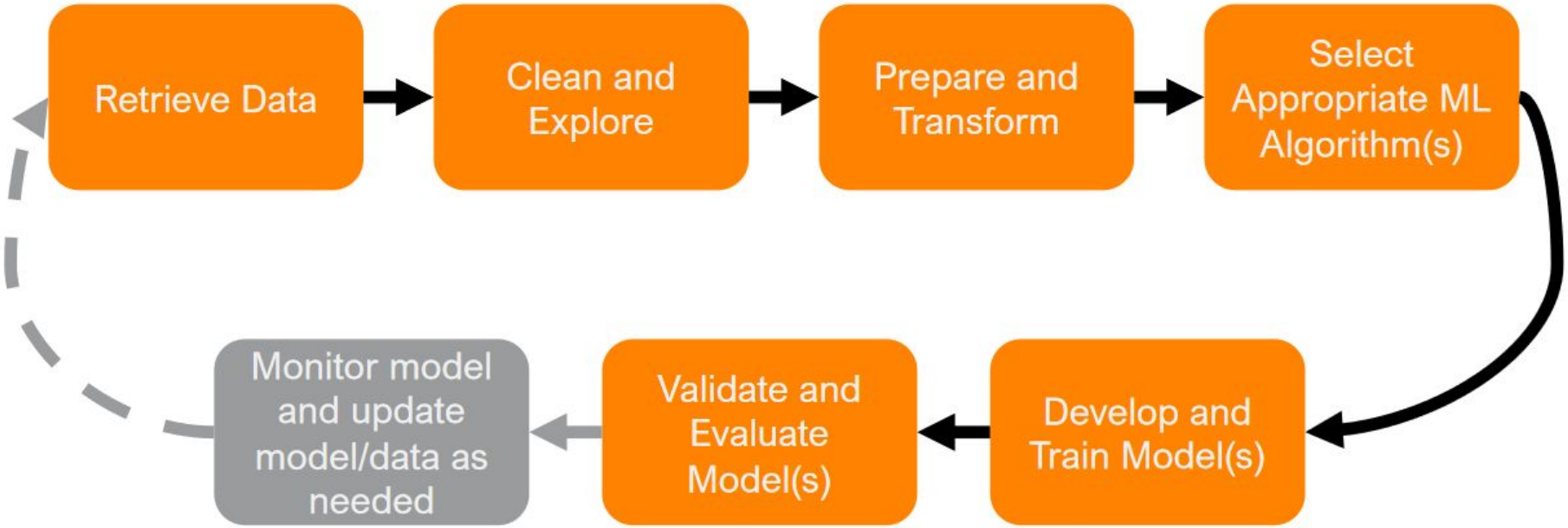
I is in the word but in the wrong spot.

U is not in the word in any spot.

Wordle Solver

- Try to solve Wordle with the least attempts
- Goal: Find the answer within 5 attempts
- After training -> Find it within 3-4 attempts

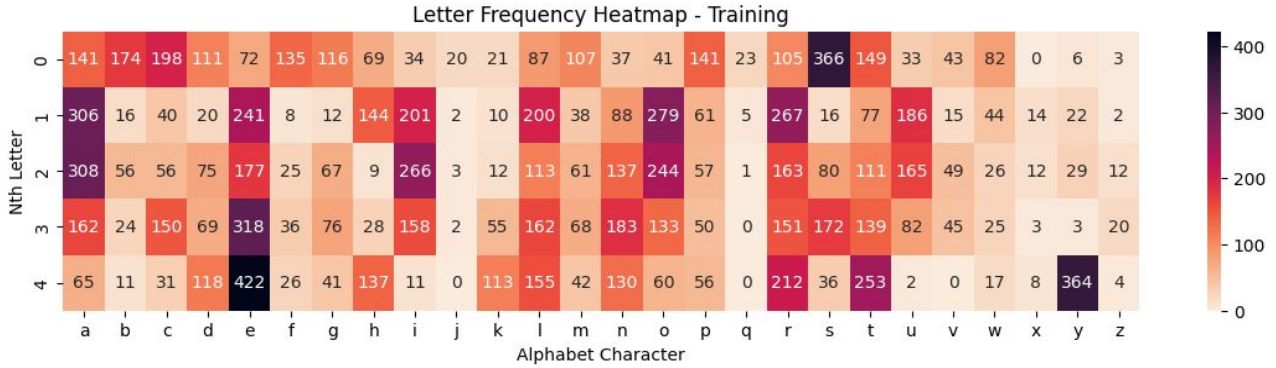
Overall Process of Final Project



Dataset

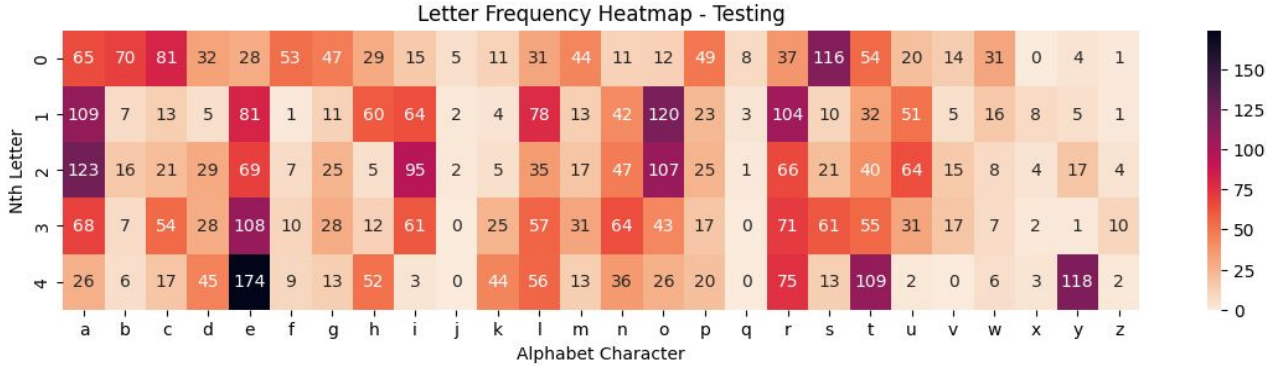
Training Dataset

Subset of possible 5-letter words (2,315 words)



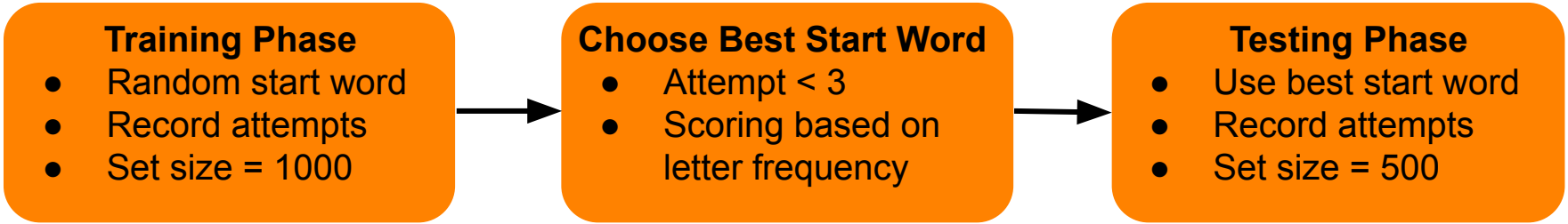
Testing Dataset

Previous Wordle answers (868 words)



Machine Learning Method

- **Bayesian Model**:
  - Statistical model
  - Assign probabilities based on guess accuracy
  - Make another guess based on probabilities



Training / Testing Phase

```
word #1: dowel
attempt: 4
word #2: wound
attempt: 4
word #3: shalt
attempt: 2
word #4: forgo
attempt: 5
word #5: milky
attempt: 4
word #6: shone
attempt: 1
word #7: abbey
attempt: 4
word #8: melee
attempt: 5
word #9: grove
attempt: 4
word #10: ovoid
attempt: 2
word #11: cleft
attempt: 4
word #12: skill
attempt: 3
word #13: idyll
attempt: 4
...
```

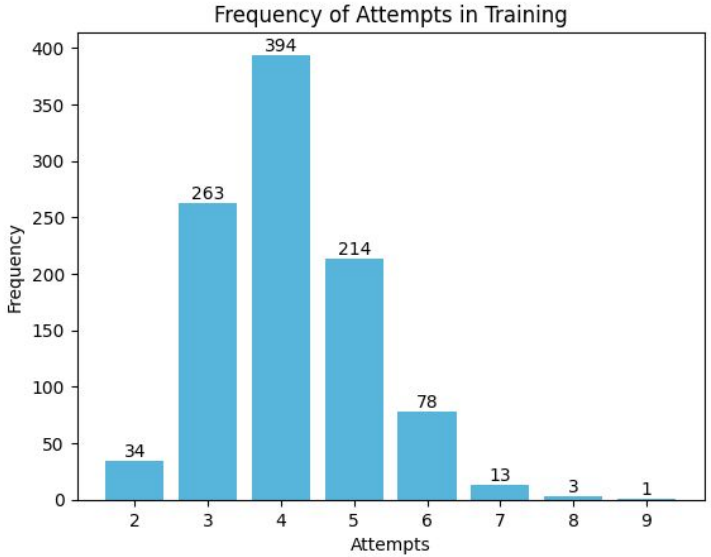
Letter Frequency Scoring

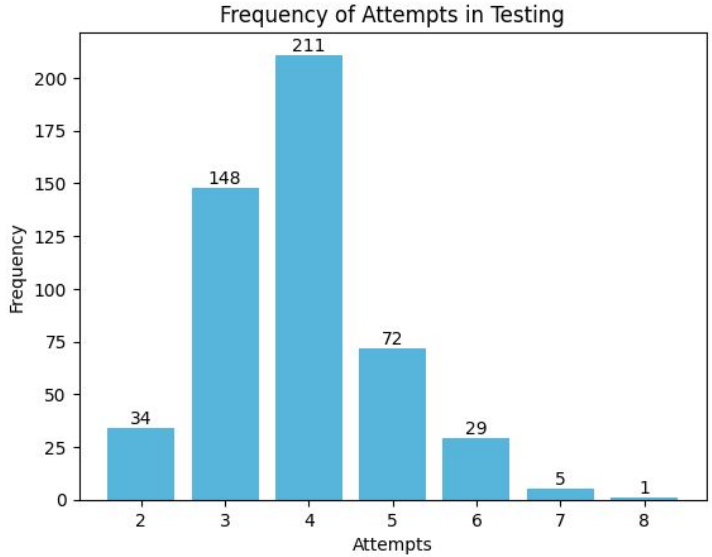
```
Word Scores:
earth: 42.006
shone: 39.379
avert: 36.89
rouse: 35.281
singe: 34.759
coast: 33.839
awoke: 32.507999999999996
swept: 32.373999999999995
shout: 31.741999999999997
plier: 31.609
wafer: 31.444000000000003
piano: 31.317999999999998
plead: 31.076
roach: 30.537000000000003
forge: 30.439
baker: 30.119999999999997
hyper: 28.686
turbo: 26.800000000000004
juice: 25.461
dutch: 24.943
bingo: 24.729
smack: 21.453999999999997
corer: 5.029999999999996
villa: 4.036
...
bleed: -28.336
geese: -80.572

Best Word for the First Word in Wordle: earth
```

Results

- Average attempts during **training**: 4.09
- Average attempts during **testing**: 3.87





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Let's Play Wordle!
Please think of a word and provide feedback as follows:
0 for MISS, 1 for MISPLACED, and 2 for EXACT.
Attempt 1: lathe - Enter feedback (0/1/2): 00000
⬛⬛⬛⬛⬛
Attempt 2: forum - Enter feedback (0/1/2): 02010
⬛🟩⬛🟨⬛
Attempt 3: wound - Enter feedback (0/1/2): 02220
⬛🟩🟩🟩⬛
Attempt 4: young - Enter feedback (0/1/2): 22222
🟩🟩🟩🟩🟩
Congratulations! The word was 'young'. It took 4 attempts to guess.
```

DEMO

Future Work

- Lower the average number of attempts to 3-4 attempts
- Trying different ML algorithms

Thank you!

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