Part of Speech Tagging

REVIEW | HISTORY

Meets Specifications

FURTHER READING

Below are links to some material you might find interesting for more insight on the subject matter:

1. AI in Practice: Identifying Parts of Speech in Python
2. POS Tagging and Chunking in NLP
3. POS for Social Media
4. Parts Of Speech Tagging With HMM and Viterbi Algorithm in NLP
5. Part-of-Speech Tagging
6. An introduction to part-of-speech tagging and the Hidden Markov Model

OVERALL COMMENTS

Great work! Congratulations on meeting all requirements of Rubric and your work shows your effort and understanding of concepts 🎉 🎉
You did a great job and should be proud of yourself. After reviewing this submission, I am impressed and satisfied with the effort and understanding put in to make this project a success.
All the requirements have been met successfully 💯 %
I want you to get the best out of this review and hence I have tried to provide you a holistic experience in this review by adding :-

- Few Suggestions which you can try and improve your python skills.
- Appreciation where you did great
- Some learning opportunities to learn POS/HMM beyond coursework

I hope you find these suggestions informative 😃
Keep doing the great work and all the best for future projects 👍

General Requirements

✓

- Includes `HMM Tagger.ipynb` displaying output for all executed cells
- Includes `HMM Tagger.html`, which is an HTML copy of the notebook showing the output from executing all cells

Both notebook and HTML are included with submission 👍

✓ Submitted notebook has made no changes to test case assertions

No changes were made to test case assertions.

Baseline Tagger Implementation

✓ Emission count test case assertions all pass.

- The emission counts dictionary has 12 keys, one for each of the tags in the universal tagset
- "time" is the most common word tagged as a NOUN

emission counts look good 👏
We could also use defaultdict to avoid explicit initialization of dictionary keys. We could then use Counter as the default value for defaultdict.
Next, we could use python zip function to create an iterator that could in turn be used to implement the actual counter.

```
def pair_counts(sequences_A, sequences_B):
    # initialize dictionary with default value set to Counter
    dictionary = defaultdict(Counter)
    for i in range(len(sequences_A)):
       for key, value in zip(sequences_A[i],sequences_B[i]):
            dictionary[key][value] += 1

    return dictionary
```

```
emission_counts = pair_counts(data.training_set.Y, data.training_set.X)
```

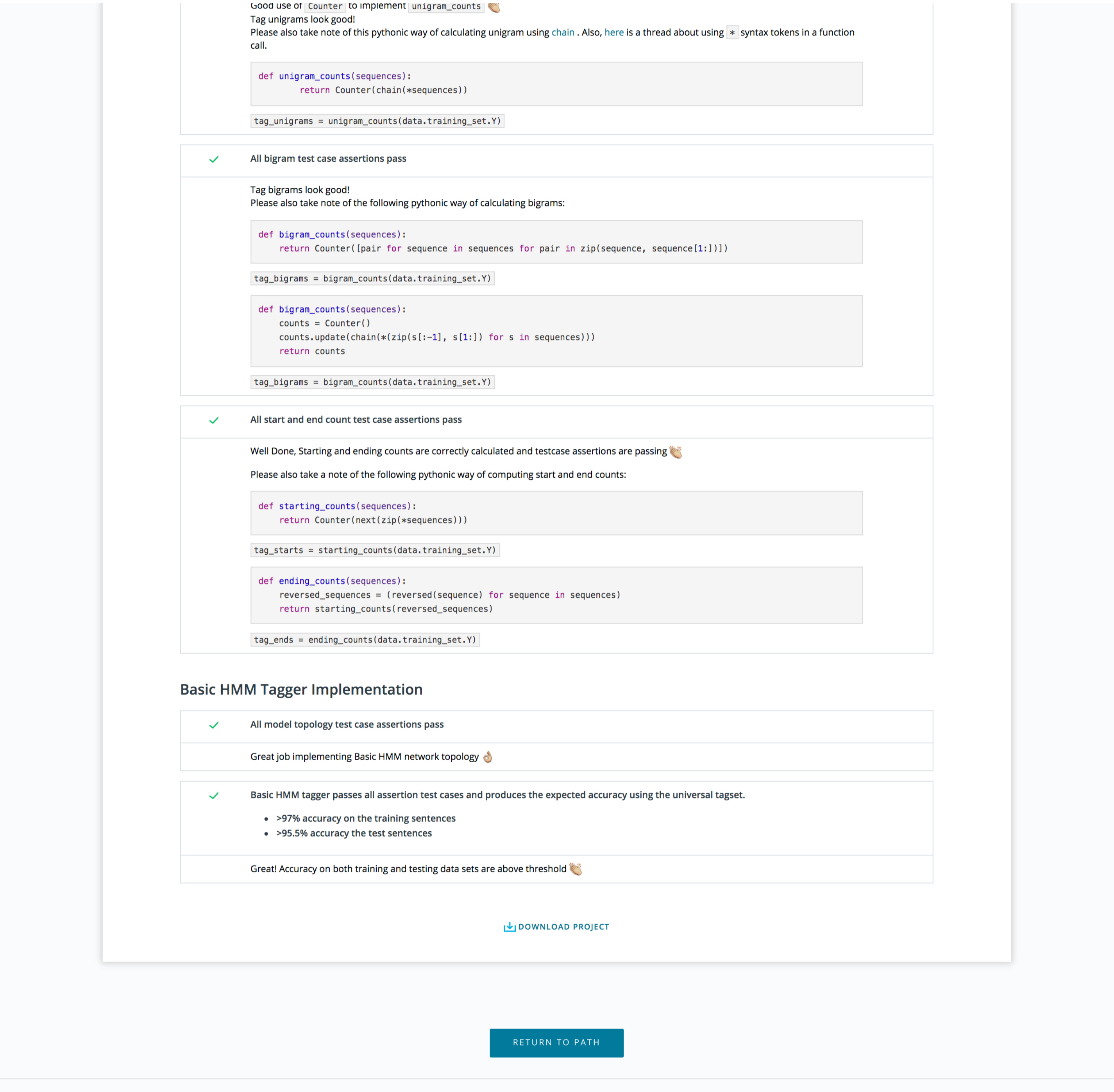
✓ Baseline MFC tagger passes all test case assertions and produces the expected accuracy using the universal tagset.

- >95.5% accuracy on the training sentences
- 93% accuracy the test sentences

MFC tagger accuracy looks good. 👌
You could use itertools.chain to merge different tuples of words and sequences

Calculating Tag Counts

✓ All unigram test case assertions pass



Good use of `Counter` to implement `unigram_counts` 👏
Tag unigrams look good!
Please also take note of this pythonic way of calculating unigram using chain . Also, here is a thread about using `*` syntax tokens in a function call.

```
def unigram_counts(sequences):
        return Counter(chain(*sequences))
```

`tag_unigrams = unigram_counts(data.training_set.Y)`

✓ All bigram test case assertions pass

Tag bigrams look good!
Please also take note of the following pythonic way of calculating bigrams:

```
def bigram_counts(sequences):
    return Counter([pair for sequence in sequences for pair in zip(sequence, sequence[1:])])
```

`tag_bigrams = bigram_counts(data.training_set.Y)`

```
def bigram_counts(sequences):
    counts = Counter()
    counts.update(chain(*(zip(s[:-1], s[1:]) for s in sequences)))
    return counts
```

`tag_bigrams = bigram_counts(data.training_set.Y)`

✓ All start and end count test case assertions pass

Well Done, Starting and ending counts are correctly calculated and testcase assertions are passing 👏

Please also take a note of the following pythonic way of computing start and end counts:

```
def starting_counts(sequences):
    return Counter(next(zip(*sequences)))
```

`tag_starts = starting_counts(data.training_set.Y)`

```
def ending_counts(sequences):
    reversed_sequences = (reversed(sequence) for sequence in sequences)
    return starting_counts(reversed_sequences)
```

`tag_ends = ending_counts(data.training_set.Y)`

Basic HMM Tagger Implementation

✓ All model topology test case assertions pass

Great job implementing Basic HMM network topology 👌

✓ Basic HMM tagger passes all assertion test cases and produces the expected accuracy using the universal tagset.

- >97% accuracy on the training sentences
- >95.5% accuracy the test sentences

Great! Accuracy on both training and testing data sets are above threshold 👏