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Week 2 : Assignment 2

The due date for submitting this assignment has passed.

Due on 2025-02-05, 23:59 IST.

Assignment submitted on 2025-02-04, 20:13 IST

1) A 5-gram model is a _____ order Markov Model. ***1 point***

- Constant
- Five
- Six
- Four

Yes, the answer is correct.
Score: 1
Accepted Answers:
Four

2) For a given corpus, the count of occurrence of the unigram “stay” is 300. If the Maximum Likelihood Estimation (MLE) for the bigram “stay curious” is 0.4, what is the count of occurrence of the bigram “stay curious”? ***1 point***

- 123
- 300
- 750
- 120

Yes, the answer is correct.
Score: 1

Accepted Answers:
120

3) Which of the following are governing principles for Probabilistic Language Models? ***1 point***

- [x] Chain Rule of Probability
- [x] Markov Assumption
- [ ] Fourier Transform
- [ ] Gradient Descent

Yes, the answer is correct.
Score: 1

Accepted Answers:
Chain Rule of Probability
Markov Assumption

For Question 4 to 5, consider the following corpus:

<*s*>the sunset is nice</*s*>
<*s*>people watch the sunset</*s*>
<*s*>they enjoy the beautiful sunset</*s*>

4) Assuming a bi-gram language model, calculate the probability of the sentence: ***2 points***

<*s*>people watch the beautiful sunset</*s*>
Ignore the unigram probability of P(<*s*>) in your calculation.

- ( ) 2/27
- (•) 1/27
- ( ) 2/9
- ( ) 1/6

No, the answer is incorrect.
Score: 0

Accepted Answers:
2/27

5) Assuming a bi-gram language model, calculate the perplexity of the sentence: ***2 points***

<*s*>people watch the beautiful sunset</*s*>
Do not consider <*s*>and</*s*> in the count of words of the sentence.

- ( ) $27^{1/4}$
- ( ) $27^{1/5}$
- ( ) $9^{1/6}$
- (•) $(27/2)^{1/5}$

Yes, the answer is correct.

Score: 2

Accepted Answers:
$(27/2)^{1/5}$

6) What is the main intuition behind Kneser-Ney smoothing? ***1 point***

- Assign higher probability to frequent words.
- Use continuation probability to better model words appearing in a novel context.
- Normalize probabilities by word length.
- Minimize perplexity for unseen words

Yes, the answer is correct.
Score: 1

Accepted Answers:
Use continuation probability to better model words appearing in a novel context.

7) In perplexity-based evaluation of a language model, what does a lower perplexity score indicate? ***1 point***

- Worse model performance
- Better language model performance
- Increased vocabulary size
- More sparse data

Yes, the answer is correct.
Score: 1

Accepted Answers:
Better language model performance

8) Which of the following is a limitation of statistical language models like n-grams? ***1 point***

- Fixed context size
- High memory requirements for large vocabularies
- Difficulty in generalizing to unseen data
- All of the above

Yes, the answer is correct.
Score: 1

Accepted Answers:
All of the above