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Naive Bayes

Practice Quiz • 30 min • 10 total points

1. Assume that there are 2 happy people and 2 unhappy people in a room. Concretely, persons A and B are happy and persons C and D are unhappy. If you were to randomly pick a person from the room, what is the probability that the person is happy.

1 / 1 point

- (●) 1/2
- ( ) 1/4
- ( ) 3/4
- ( ) 0

✓ **Correct**

2. Assume that there are 2 happy people and 2 unhappy people in a room. Concretely, persons A and B are happy and persons C and D are unhappy. If a friend showed you the part of the room where the two happy people are, what is the probability that you choose person B?

1 / 1 point

- (●) 1/2
- ( ) 1/4
- ( ) 3/4
- ( ) 1

✓ **Correct**

3. From the equations presented below, express the probability of a tweet being positive given that it contains the word happy in terms of the probability of a tweet containing the word happy given that it is positive

1 / 1 point

$P(\text{ Positive } \mid \text{ "happy" }) = \frac{P(\text{ Positive } \cap \text{ "happy" })}{P(\text{ "happy" })}$

$P(\text{ "happy" } \mid \text{ Positive }) = \frac{P(\text{ "happy" } \cap \text{ Positive })}{P(\text{ Positive })}$

- (●) $P(\text{ Positive } \mid \text{ "happy" }) = P(\text{"happy" } \mid \text{ Positive }) \times \frac{P(\text{ Positive })}{P(\text{"happy"})}$
- ( ) $P(\text{ Positive } \mid \text{ "happy" }) = P(\text{ "happy" } \mid \text{ Positive }) \times \frac{P(\text{ "happy" })}{P(\text{ Positive })}$
- ( ) $P(\text{ Positive } \cap \text{ "happy" }) = P(\text{ "happy" } \mid \text{ Positive }) \times \frac{P(\text{ Positive })}{P(\text{"happy"})}$
- ( ) $P(\text{ Positive } \cap \text{ "happy" }) = P(\text{ "happy" } \mid \text{ Positive }) \times \frac{P(\text{ "happy" })}{P(\text{ Positive })}$

Correct
Yes, that is the correct answer.

4. Bayes rule is defined as

1 / 1 point

- (●) $P(X \mid Y) = P(Y \mid X) \times \frac{P(X)}{P(Y)}$
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Correct
Yes.

5. Suppose that in your dataset, 25% of the positive tweets contain the word 'happy'. You also know that a total of 13% of the tweets in your dataset contain the word 'happy', and that 40% of the total number of tweets are positive. You observe the tweet: ''happy to learn NLP'. What is the probability that this tweet is positive? (Please, round your answer up to two decimal places. Remember that 0.578 = 0.58 and 0.572 = 0.57)

1 / 1 point

0.77

Correct
That's right. You just applied Bayes' rule.

6. The log likelihood for a certain word w_i is defined as:

1 / 1 point

6. The log likelihood for a certain word w_i is defined as: **1 / 1 point**

$\log(\frac{P(w_i|pos)}{P(w_i|neg)})$.

- [x] Positive numbers imply that the word is positive.

Correct

- [ ] Positive numbers imply that the word is negative.
- [x] Negative numbers imply that the word is negative.

Correct

- [ ] Negative numbers imply that the word is positive.

7. The log likelihood mentioned in lecture, which is the log of the ratio between two probabilities is bounded between **1 / 1 point**

- ( ) -1 and 1
- (•) $-\infty$ and ∞
- ( ) 0 and ∞
- ( ) 0 and 1

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7. The log likelihood mentioned in lecture, which is the log of the ratio between two probabilities is bounded between **1 / 1 point**

- ( ) -1 and 1
- (•) $-\infty$ and ∞
- ( ) 0 and ∞
- ( ) 0 and 1

Correct
Yes!

8. When implementing naive Bayes, in which order should the following steps be implemented. **1 / 1 point**

(•) 1. Get or annotate a dataset with positive and negative tweets
2. Preprocess the tweets: process_tweet(tweet) ➞
3. Compute freq(w, class)
4. Get P(w | pos), P(w | neg)

Correct
Yes, that is correct.

9. To test naive bayes model, which of the following are required? **1 / 1 point**

- (●) $X_{\text{val}}, Y_{\text{val}}, \lambda, logprior$
- ( ) $X_{\text{val}}, Y_{\text{val}}, logprior$
- ( ) $X_{\text{val}}, \lambda, logprior$
- ( ) $Y_{\text{val}}, \lambda, logprior$

Correct
This is correct.

10. Which of the following is NOT an application of naive Bayes? **1 / 1 point**

- ( ) Sentiment Analysis
- ( ) Author identification
- ( ) Information retrieval
- ( ) Word disambiguation
- (●) Numerical predictions