

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

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

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

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

4. Bayes rule is defined as

1 / 1 point

- ☒ $P(X | Y) = P(Y | X) \times \frac{P(X)}{P(Y)}$
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- ☐ $P(X | Y) = P(Y | X) \times \frac{P(X)}{P(Y|X)}$

✓ **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

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

☒ Positive numbers imply that the word is positive.

✓ **Correct**

☐ Positive numbers imply that the word is negative.

☒ 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

✓ **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 $P(w \mid \text{pos})$, $P(w \mid \text{neg})$
 - 5. Get $\lambda(w)$
 - 6. Compute $\text{logprior} = \log(P(\text{pos}) / P(\text{neg}))$
- ☐
 - 1. Get or annotate a dataset with positive and negative tweets
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 - 5. Get $P(w \mid \text{pos})$, $P(w \mid \text{neg})$

3. Preprocess the tweets: $\text{process_tweet}(\text{tweet}) \rightarrow$

4. Compute $\log\text{prior} = \log(P(\text{pos}) / P(\text{neg}))$

5. Get $P(w \mid \text{pos}), P(w \mid \text{neg})$

6. Get $\lambda(w)$

✓ **Correct**

Yes, that is correct.

9. To test naive bayes model, which of the following are required?

1 / 1 point

☒ $X_{\text{val}}, Y_{\text{val}}, \lambda, \log\text{prior}$

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☐ $Y_{\text{val}}, \lambda, \log\text{prior}$

✓ **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

✓ **Correct**

This is correct.