

2nd Quiz: Probabilistic Machine Learning (16th March 2022)

Due 16 Mar 2022 at 11:00

Points 10

Questions 10

Available 16 Mar 2022 at 10:00 - 16 Mar 2022 at 11:05 1 hour and 5 minutes

Time limit None

This quiz was locked 16 Mar 2022 at 11:05.

Attempt history

	Attempt	Time	Score
LATEST	Attempt 1	34 minutes	7 out of 10

Score for this quiz: **7** out of 10

Submitted 16 Mar 2022 at 10:34

This attempt took 34 minutes.

Question 1

1 / 1 pts

What is the main reason we favor the log-likelihood over the likelihood function?



Because the logarithm can accept many different bases (e.g. \log_2 , \log_{10}) and we can choose the one most suitable to our problem.



Because it is a convex function and thus can only have one maximum.



Because the logarithm can only take on positive inputs.



Because the likelihood function often has the form of a product and taking logarithms changes a product to a sum which is easier to differentiate.

Correct!

Question 2

1 / 1 pts

Which of the following values the likelihood function of a parameter can only take?

☐ 2

☐ -0.5

☒ 0.25

☐ 1.1

Correct!

Question 3

1 / 1 pts

Logistic regression is used when you want to

☐ Predict a continuous variable from binary variables.

☐ Predict a binary variable from binary variables only.

☐ Predict a continuous variable from binary or continuous variables.

☒ Predict a binary variable from continuous or binary variables.

Correct!

Question 4

1 / 1 pts

Logistic regression assumes

Correct!

☐

linear relationship between the independent variables and the dependent variable.

☐

linear relationship between the observations.

☒

linear relationship between the independent variables and the logit of the dependent variable.

☐

linear relationship between the independent variables.

Question 5

1 / 1 pts

A predicted logit of 0 can be transformed into a probability of

☐

0.25

☐

1

☒

0.5

☐

0

Correct!

Question 6

0 / 1 pts

Suppose we fit a linear regression model with one dependent variable, x , and one independent variable, y , of the following form

$$\hat{y} = \theta_0 + \theta_1 x$$

where $\theta_0, \theta_1 \in \mathbb{R}$ are the parameters of the fitted model. What is the interpretation of θ_0

Incorrect answer

- ☐ The predicted value of y when the value of x is 0.
- ☐ The mean predicted value of y over all possible values of x .
- ☐ It has no direct meaning to the model.

You Answered

- ☒ The predicted increase of y when x increases by 1 unit.

Question 7

1 / 1 pts

The entropy of a random variable X can be informally interpreted as a measure of

- ☐ the ratio between the largest and smallest values of X .
- ☐ the least probable outcome of X .
- ☒ the uncertainty of X .
- ☐ the most probable outcome of X .

Correct!

Question 8

0 / 1 pts

What is the entropy of a variable that can only take on one value?

- ☐ 1 bit
- ☐ 0 bit.
- ☐ 0.333 bit
- ☒ 0.5 bit

Incorrect answer

You Answered

Question 9

0 / 1 pts

Suppose we have two discrete random variables X and Y and let x and y be the most probable outcomes of X and Y respectively. If $\Pr(x) < \Pr(y)$, what is the relationship between the entropies $H(X)$ and $H(Y)$?

Not Answered

☒ $H(X) < H(Y)$

Correct answer

☐

There are other factors that influence the relationship between $H(X)$ and $H(Y)$

☐ $H(X) = H(Y)$

☐ $H(X) > H(Y)$

Question 10

1 / 1 pts

Suppose we have two coins X and Y whose probabilities of heads are x and y respectively where $0.5 \leq x < y$. What is the relationship between the entropies $H(X)$ and $H(Y)$?

☐ $H(X) < H(Y)$

Correct!

☒ $H(X) > H(Y)$

☐

There are other factors that influence the relationship between $H(X)$ and $H(Y)$.

☐ $H(X) = H(Y)$

Quiz score: **7** out of 10