

- Welcome
- Introduction: Machine Learning concepts
- ▶ Module 1. The Predictive Modeling **Pipeline**
- Module 2. Selecting the best model
- Module 3. Hyperparameter tuning
- → Module 4. **Linear Models**

Module overview

Intuitions on linear models

Quiz M4

(A)

Non-linear feature engineering for linear models Quiz M4

Regularization in linear model Ø Ouiz M4

Wrap-up quiz

☑ Quiz M4.01

Note: For each question make sure you select all of the correct options— there may be more than one! Don't forget to use the sandbox notebook if you need.

Question 1 (1/1 point)

What is a linear regression?

- a) a model that outputs a continuous prediction as the sum of the values of a **limited** subset of the input features
- O b) a model that outputs a binary prediction based on a linear combination of the values of the input features
- c) a model that output a continuous prediction as a weighted sum of the input features

EXPLANATION

solution: c)

A linear regression model combines the values of the input features (with an additional intercept) using a weighted sum with automatically adjusted weights to predict the value of a continuous target variable.

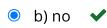
You have used 1 of 1 submissions

Question 2 (1/1 point)



- Module 5.Decision tree models
- Module 6.Ensemble of models
- Module 7.Evaluating model performance
- ▶ Conclusion
- Appendix





EXPLANATION

solution: b)

By definition, in a non-linearly separable dataset, the points of different classes cannot be separated by a single straight line (or an hyperplane which is the generalization of a straight line for higher dimensional problems).

The decision boundary of a linear classifier by itself is always a hyperplane.

Therefore it is not possible to get zero training error with a linear classifier such as logistic regression on a non-linearly separable dataset.

In a future section, we will se how non-linearities can be expressed by linear models when used along with feature engineering, and therefore reducing the prediction error on the training set.

You have used 1 of 1 submissions

Question 3 (1/1 point)

If we fit a linear regression where x is a single column vector, how many parameters our model will be made of?

O a) 1







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Solution: b)

The model is of the form $\begin{bmatrix} a * x + b \end{bmatrix}$ where x is a number (i.e. the value of the single feature). The parameters are $\begin{bmatrix} a \end{bmatrix}$ (called the slope) and $\begin{bmatrix} b \end{bmatrix}$ (called the intercept).

You have used 1 of 1 submissions

Question 4 (1/1 point)

If we train a scikit-learn LinearRegression with X being a single column vector and y a vector, coef_ and intercept_ will be respectively:

- a) an array of shape (1, 1) and a number
- O b) an array of shape (1,) and an array of shape (1,)
- O c) an array of shape (1, 1) and an array of shape (1,)
- d) an array of shape (1,) and a number

EXPLANATION

Solution: d)



```
# data with two rows and a single column, i.e. two samples and a single
feature
data = [[1], [2]]
target = [1, 2]

model.fit(data, target)

print(f'coef_: {model.coef_}')
print(f'coef_ shape: {model.coef_.shape}')
print(f'intercept_: {model.intercept_}')
```

You have used 1 of 1 submissions

Question 5 (1/1 point)

The decision boundaries of a logistic regression model:

- a) split classes using only one of the input features
- b) split classes using a combination of the input features
- o c) often have curved shapes

EXPLANATION

The logistic regression model is a linear model of the form y_pred = np.dot(data, model.coef_) + model.intercept_. Thus, this is a linear combination of all input features.

You have used 1 of 1 submissions

Question 6 (1/1 point)



O a) (10,)
O c) (2, 10)
EXPLANATION
solution: b)
For a binary classification task, n_classes is 2.
You have used 1 of 1 submissions Question 7 (1/1 point)
In logistic regression's predict_proba method in scikit-learn, which of the following statements is true regarding the predicted probabilities?
 a) The sum of probabilities across different classes for a given sample is always equal to 1.0.
O b) The sum of probabilities across all samples for a given class is always equal to 1.0.
O c) The sum of probabilities across all features for a given class is always equal to 1.0.
EXPLANATION
solution: a)



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You have used 1 of 1 submissions

YOUR EXPERIENCE

According to you, this whole 'Intuitions on linear models' lesson was:

- Too easy, I got bored
- Adapted to my skills
- O Difficult but I was able to follow
- Too difficult

Submit

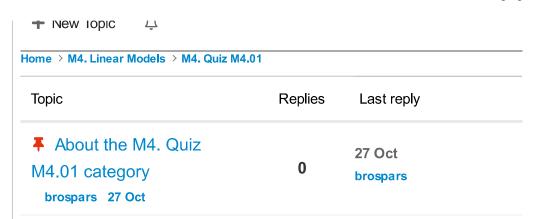
To follow this lesson, I spent:

- O less than 30 minutes
- O 30 min to 1 hour
- O 1 to 2 hours
- O 2 to 4 hours
- O more than 4 hours
- O I don't know

Submit

FORUM (EXTERNAL RESOURCE)





There are no more M4. Quiz M4.01 topics. Ready to start a new conversation?

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