Quiz - Linear Model Example

Total points 14/14

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Exercise 1) Linear Model

Use the following case description for the next 4 questions:

Joe is a gardener that performs lawn mowing services. Mark, one of his customers, developed the following model to describe the price charged by Joe to perform his lawn mowing services.

- price(d,a) = 20 + d . 3 + a . 10 USD

"d" describes the distance, in kilometers, from Joe's house to the customer's house and "a" describes the lawn area

✓ Assuming the following services performed by Joe as a test set: * 1/1

a = 30, d = 10, price = 355 USD

a = 20, d = 20, price = 270 USD

What is the Test MSE (Mean Squared Error) for the model?

62.5 ✓

Feedback

((20+10.3+30.10 - 355)^2 + (20+20.3+20.10 - 270)^2)/2 = ((-5)^2 + (10)^2)/2 = 125/2 = 62.5

✓ Select the true alternatives * 1/1

- [ ] a) In the exercise 1 problem, d (distance) and a (area) are considered labels
- [x] b) The lawn service price has a linear relationship with "d" (distance) and "a" (area in square meters) ✓
- [x] c) According to this model, Joe would charge approximately 295.00 USD for a service that is 25 km far from his home and requires mowing a lawn with 20 square meters. ✓
- [x] d) This model is equivalent to a Multivariate linear model ✓

Feedback

c) Correct. price(25,20) = 20 + 25.3 + 20.10 = 20+75+200 = 295 USD
d) Correct. It contains more than one input variables (a, and d), hence, it is a multivariate linear model.

✓ Select only the values that are used as parameters on the model proposed by Mark (exercise 1). *1/1

- [x] 20 ✓
- [ ] 355
- [x] 3 ✓
- [ ] 270
- [x] 10 ✓

✓ Select only the values that are used as labels in the test set. * 1/1

- [ ] 20
- [x] 355 ✓
- [ ] 3
- [x] 270 ✓
- [ ] 10

✓ What is a "model" in machine learning? * 1/1

- (•) A model is a mathematical relationship derived from data that an ML system uses to make predictions ✓
- ( ) A model is a smaller representation of the thing you're studying.
- ( ) A model is a piece of computer hardware

✓ Why does a model need to be trained before it can make predictions? * 1/1

- ( ) A model doesn't need to be trained. Models are available on most computers.
- ( ) A model needs to be trained so it won't require data to make a prediction.
- (•) A model needs to be trained to learn the mathematical relationship between the features and the label in a dataset. ✓

✓ Linear regression is a type of supervised learning algorithm * 1/1

- (●) True ✓
- ( ) False

✓ Linear regression can be used to solve regression problems * 1/1

- (●) True ✓
- ( ) False

✓ What kind of generalization approach best describes linear regression? * 1/1

- ( ) instance-based
- (●) model-based ✓

✓ The training process of a linear regression model consists of adjusting the model parameters in order to minimize a given cost function. *1/1

- (●) True ✓
- ( ) False

✓ Linear regression is a type of unsupervised learning algorithm * 1/1

- ○ True
- ◉ False ✓

✓ A Cost function is a function that measures how wrong the model is in terms of its ability to solve the problem (i.e., to accurately predict the output) *1/1

- ◉ True ✓
- ○ False

✓ The Mean square error is a cost function that measures the average of the squares of the errors, i.e., the distances between the true labels and the predicted ones. *1/1

- ◉ True ✓
- ○ False

✓ Loss function and model function are the same thing * 1/1

- ○ True
- ◉ False ✓