

CSAL4243

Introduction to Machine Learning

Quiz 1

Each question carry same marks. Consider all models are linear regression with one variable and mean squared error as cost function.

1. Predict how much rain will there be tomorrow from previous whether data is a regression problem. Yes/No and why ?

Ans: Yes, because Regression problems have real valued outputs and quantity of rain is measured in millimeters which is real valued as well.

2. We trained a linear regression model using house size as only feature and the resulting model is $h(x) = 20x + 100$. For a sample house of size 200 square feet the given price is \$8000. What is the error in our prediction of this house using the model. Is it a good model. Yes/No and why ?

Ans: No, because the error $|h(x) - y|$ which in this case is only \$3900 is too large compared to price of the house.

3. Someone gave you code for linear regression with gradient descent. On the first iteration you get a cost of 50.4 and at the end of 1000 iterations you got cost of 5.4. Is the code working properly? Yes/No and why ?

Ans: Yes, because cost function reduces on every step and is always positive.

4. Brute force Linear Regression will never give you a global optimal value of parameters. Yes/No and why ?

Ans: No, because in brute force we are checking every value of our parameters for cost. Hence we can find the lowest cost and global optimal parameters.

5. If parameter update equation of gradient descent is changed to the following equation, it would still result in same output. Yes/No and why?

$$\theta = \theta + \alpha \frac{\partial}{\partial \theta} J(\theta)$$

Ans: No, because it would take theta in opposite direction, result in increase of cost instead.