Day 6 Quiz

7.04.2024

Q1. Explain the two types of artificial intelligence. What makes them different?

Q2. Explain the two main types of machine learning. What are the differences in the problems they seek to solve.

Q3. What is dimensionality reduction and why might we want to do it?

Q4: What does the following notation mean? $x_8^{(9)}$

Q5: Explain of the following, stating what they are

- θ
- $h_\theta(X)$
- $\hat{y}$ and y

Q6: What is the mathematical goal of clustering? State in words rather than mathematical notation.

Q7. Explain the k-means algorithm in as much detail as possible.

Q8. Explain the mathematical goal of supervised learning. You should use notation in your answer.

Q9: Explain the process of gradient descent in detail. You should use the example of linear regression to help explain your answer.

Q10. Explain the difference between correlation and causation. Use a linear regression to support your answer. Argue whether you think the distinction is important for prediction-only tasks and why.

Q11*. Consider a model for predicting future wages.

(A) What are the interpretations of α, β_1 and β_2 in the following regression between wages, education and work experience.

$$\text{wages}^{(i)} = \alpha + \beta_1 \text{edu}^{(i)} + \beta_2 \text{exp}^{(i)} + \varepsilon^{(i)}$$

(C) What is the final term in the regression? Why is it important to include this term when writing models for the true target feature?

(B) How would your interpretation of the parameters change in the following regression?

$$\hat{\text{wages}}^{(i)} = \hat{\alpha} + \hat{\beta_1} \text{edu}^{(i)} + \hat{\beta_2} \text{exp}^{(i)}$$

* Hard