Week 8:Assignment 8

The due date for submitting this assignment has passed.

Due on 2025-03-19, 23:59 IST.

Assignment submitted on 2025-03-15, 11:40 IST

1) Regression is used in: ***1 point***

- A. predictive data mining
- B. exploratory data mining
- C. descriptive data mining
- D. explanative data mining

Yes, the answer is correct.
Score: 1
Accepted Answers:
A. predictive data mining

2) The output of a regression algorithm is usually a: ***1 point***

- A. real variable
- B. integer variable
- C. character variable
- D. string variable

Yes, the answer is correct.
Score: 1
Accepted Answers:
A. real variable

3) Regression finds out the model parameters which produces the least square error between - ***1 point***

- A. input value and output value
- B. input value and target value
- C. output value and target value
- D. model parameters and output value

Yes, the answer is correct.
Score: 1
Accepted Answers:
C. output value and target value

4) Consider x_1, x_2 to be the independent variables and y the dependent variable, which of the following represents a linear regression model? ***1 point***

- A. $y = a_0 + a_1/x_1 + a_2/x_2$
- B. $y = a_0 + a_1x_1 + a_2x_2$
- C. $y = a_0 + a_1x_1 + a_2x_2^2$
- D. $y = a_0 + a_1x_1^2 + a_2x_2$

Yes, the answer is correct.
Score: 1
Accepted Answers:
B. $y = a_0 + a_1x_1 + a_2x_2$

5) The linear regression model $y = a_0 + a_1 x$is applied to the data in the table shown below. What is the value of the sum squared error function $S(a_0, a_1)$, when $a_0 = 1$, $a_1 = 2$? **1 point**

x	y
0	1
0.5	1.9
1	2.5
1.25	3

- A. 0.00
- B. 0.25
- C. 0.50
- D. 0.51

Yes, the answer is correct.
Score: 1

Accepted Answers:
D. 0.51

6) The linear regression model $y = a_0 + a_1 x$ is to be fitted to the data in the table shown below. What is the optimal regression model obtained by minimizing sum squared error? **1 point**

x	y
0	1
1	1.9
2	3.2
2.5	3.4

- A. $y = 1.01 - 2.10x$
- B. $y = 1.01 + 2.10x$
- C. $y = 1.01 - 0.98x$
- D. $y = 1.01 + 0.98x$

Yes, the answer is correct.
Score: 1

Accepted Answers:
D. $y = 1.01 + 0.98x$

7) The linear regression model $y = a_0 + a_1 x_1 + a_2 x_2 + \ldots + a_p x_p$ is to be fitted to a set of N training data points having p attributes each. Let X be $N \times (p+1)$ vectors of input values (augmented by 1's), Y be $N \times 1$ vector of target values, and θ be $(p+1) \times 1$ vector of parameter values $(a_0, a_1, a_2, \ldots, a_p)$. If the sum squared error is minimized for obtaining the optimal regression model, which of the following equation holds? **1 point**

- A. $X^T X = Xy$
- B. $X\theta = X^T y$
- C. $X^T X\theta = y$
- D. $X^T X\theta = X^T y$

Yes, the answer is correct.
Score: 1

Accepted Answers:
D. $X^T X\theta = X^T y$

8) Accuracy of a linear regression model usually has? *1 point*

- A. low bias and low variance
- B. low bias but high variance
- C. high bias but low variance
- D. high bias and high variance

Yes, the answer is correct.
Score: 1

Accepted Answers:
C. high bias but low variance

9) A time series prediction problem is often solved using? *1 point*

- A. Multivariate regression
- B. Autoregression
- C. Logistic regression
- D. Sinusoidal regression

Yes, the answer is correct.
Score: 1

Accepted Answers:
B. Autoregression

10) In principal component analysis, the projected lower dimensional space corresponds to – *1 point*

- A. subset of the original co-ordinate axis
- B. eigenvectors of the data covariance matrix
- C. eigenvectors of the data distance matrix
- D. orthogonal vectors to the original co-ordinate axis

Yes, the answer is correct.
Score: 1

Accepted Answers:
B. eigenvectors of the data covariance matrix