Dashboard / My courses / COMS3007A-ML-2021 / Quizzes / Quiz 4: Whole course

Started on	Thursday, 10 June 2021, 8:45 PM
State	Finished
Completed on	Saturday, 12 June 2021, 9:55 AM
Time taken	1 day 13 hours
Grade	**9.50** out of 12.00 (**79**%)

Question **1**
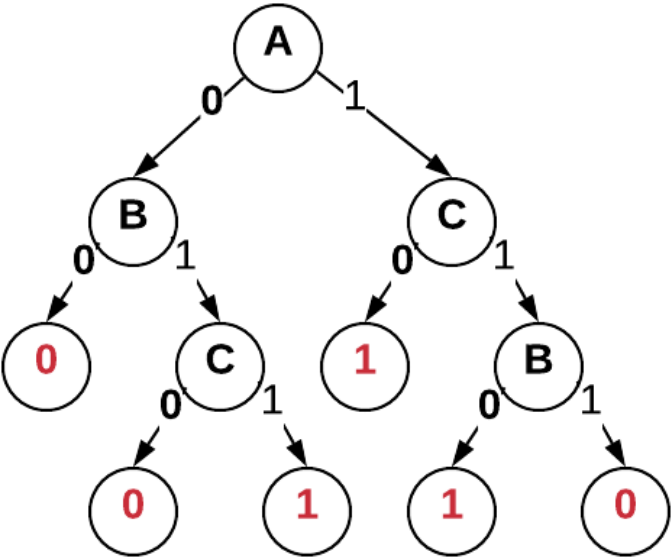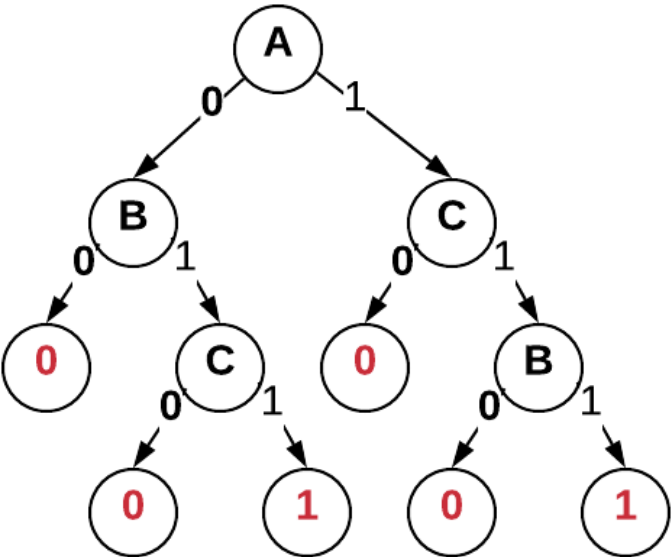
Correct

Mark 2.00 out of 2.00

Consider the binary expression: A XOR (B AND C)

Which decision tree corresponds to this binary expression?

Select one:

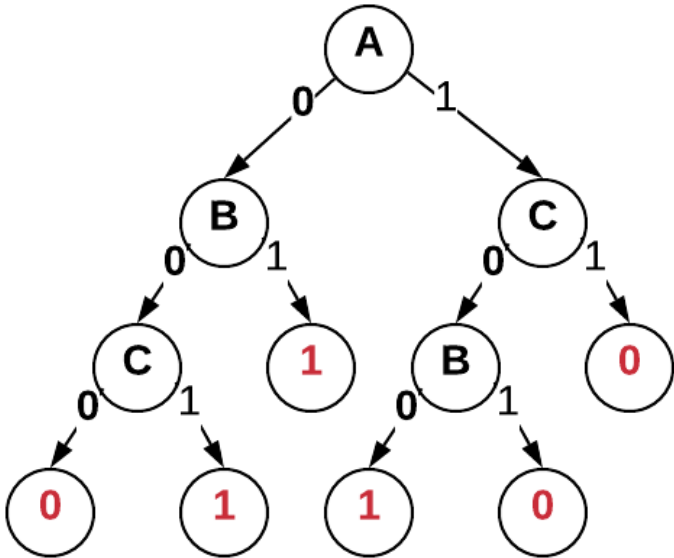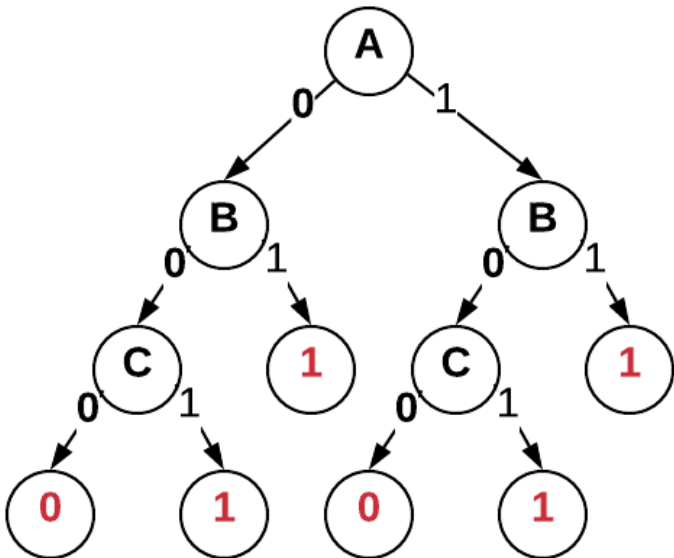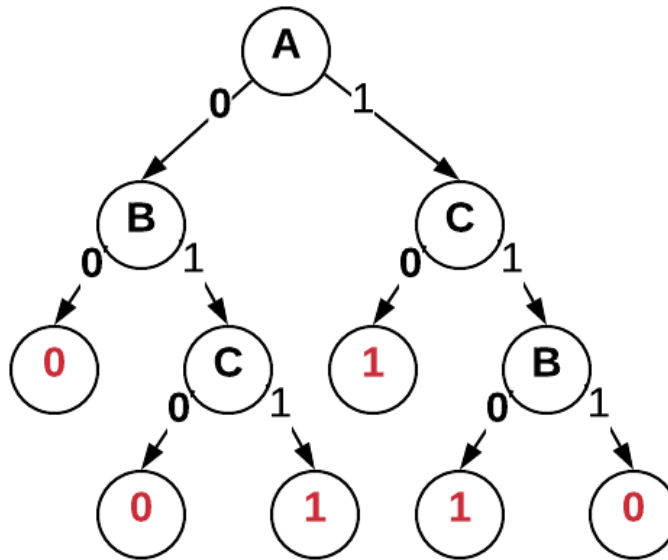○ a.   ✔

○ b.

○ c.

○ d.

Your answer is correct.

The correct answer is:

Question **2**

Correct

Mark 2.00 out of 2.00

Consider the following data:

x: 5 4 3 2 1
y: 2 4 6 8 10

Compute the closed form solution $\theta = (X^T X)^{-1} X^T y$ and the error function $E(\theta) = \frac{1}{2} \sum_{i=1}^{n} (y^{(i)} - f(x^{(i)}, \theta))^2$ where f is the linear regression function given by $y = f(x, \theta) = \theta_0 + \theta_1 x$.

Select the appropriate values of θ and $E(\theta)$ below.

Select one:

- a. $\theta = [12, -2]$ and $E(\theta) = 0$ ✔
- b. $\theta = [-12, 2]$ and $E(\theta) = -0.18$
- c. $\theta = [-2, 12]$ and $E(\theta) = 0$
- d. $\theta = [-2, -12]$ and $E(\theta) = 0.18$
- e. None of the above
- f. $\theta = [12, -2]$ and $E(\theta) = 8.88$

Your answer is correct.

The correct answer is: $\theta = [12, -2]$ and $E(\theta) = 0$

Question **3**

Correct

Mark 2.00 out of 2.00

After training has completed you have the following logistic regression model:

$y = \sigma(-0.56 + 0.32x_1 + 0.84x_2)$.

What is the formula for the decision boundary of the model?

Select one:

- a. $x_2 = 1.65 - 0.78x_1$
- b. $x_1 = 1.72 - 2.63x_2$ ✔
- c. $x_2 = 0 - 3.44x_2$
- d. $x_1 = -5.0 + 0x_2$
- e. $x_1 = -2.9 + 2.12x_2$

Your answer is correct.

The correct answer is: $x_1 = 1.72 - 2.63x_2$

Question **4**

Correct

Mark 2.00 out of 2.00

Select all the statements below that are true.

Select one or more:

- ☑ a.   Every Boolean function can be represented by some artificial neural network of perceptrons only two levels deep.   ✔
- ☑ b.   It is possible for a centroid to have no allocated data points in k-means clustering.   ✔
- ☐ c.   Logistic regression learns a non-linear decision boundary.
- ☐ d.   For linear regression, it is possible for gradient descent to learn a better fit of the training data than the closed form solution.
- ☑ e.   In RL, the learned value of a terminal state will just be the expected reward from that state.   ✔

Your answer is correct.

The correct answers are: Every Boolean function can be represented by some artificial neural network of perceptrons only two levels deep., It is possible for a centroid to have no allocated data points in k-means clustering., In RL, the learned value of a terminal state will just be the expected reward from that state.

Question **5**

Partially correct

Mark 1.50 out of 2.00

Select all the statements below that are true.

Select one or more:

☐ a. When regularization is too high, or the learning rate is too low, the error rate might remain constant during the first several epochs.

☑ b. K-means algorithm is sensitive to initialization and outliers. ✔

☑ c. Missing or corrupt values in data can be replaced with the mean/median/mode, or given a unique value. ✔

☐ d. Using only immediate rewards in reinforcement learning will help us get to our goal faster.

☑ e. Naive Bayes assumes that all the features in a dataset are equally important. ✔

☐ f. Regularization improves performance on the test data as the lambda value gets larger.

Your answer is partially correct.

You have correctly selected 3.

The correct answers are: Missing or corrupt values in data can be replaced with the mean/median/mode, or given a unique value., Naive Bayes assumes that all the features in a dataset are equally important., K-means algorithm is sensitive to initialization and outliers., When regularization is too high, or the learning rate is too low, the error rate might remain constant during the first several epochs.

Question **6**

Incorrect

Mark 0.00 out of 2.00

You have a matrix of data X with N data points (rows) and M features (columns). You want to find the average value for each feature using the data.

(a) What is the shape of the data matrix X?

(b) Which value must you use for the axis parameter of the numpy.mean() function to perform the desired calculation?

(c) What is the shape of the output array from the mean calculation?

Select one:

- a.
  (a): (M,N)

  (b): 1

  (c): (N,)   ✖

- b.
  (a): (N,N)

  (b): 2

  (c): (N,)

- c.
  (a): (N,M)

  (b): 2

  (c): (N,)

- d.
  (a): (N,N)

  (b): 1

  (c): (M,)

- e.
  (a): (N,M)

  (b): 0

  (c): (M,)

- f.
  (a): (M,N)

  (b): 0

  (c): (M,)

Your answer is incorrect.

The correct answer is:
(a): (N,M)
(b): 0
(c): (M,)

◄ Quiz 3: Clustering, Applying ML, RL

Jump to...

2021 assignment ►