Suppose the application is running on port 8080. What will be rendered inside router-view for the URL "http://127.0.0.1:8080/#/profile/Arnav"?

Options :

6406533039766. ✖ Page Not Found

6406533039767. ✖ Name: Animesh, State: MP

6406533039768. ✖ Name: Arnav, State: Goa

6406533039769. ✔ Unknown User

MLT

Section Id :	64065364080
Section Number :	12
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	18
Number of Questions to be attempted :	18
Section Marks :	50
Display Number Panel :	Yes
Section Negative Marks :	0
Group All Questions :	No
Enable Mark as Answered Mark for Review and Clear Response :	No
Maximum Instruction Time :	0
Sub-Section Number :	1
Sub-Section Id :	640653133724
Question Shuffling Allowed :	No

Question Number : 260 Question Id : 640653902554 Question Type : MCQ Calculator : Yes Correct Marks : 0

Question Label : Multiple Choice Question

THIS IS QUESTION PAPER FOR THE SUBJECT "DIPLOMA LEVEL : MACHINE LEARNING TECHNIQUES (COMPUTER BASED EXAM)"

ARE YOU SURE YOU HAVE TO WRITE EXAM FOR THIS SUBJECT?
CROSS CHECK YOUR HALL TICKET TO CONFIRM THE SUBJECTS TO BE WRITTEN.

(IF IT IS NOT THE CORRECT SUBJECT, PLS CHECK THE SECTION AT THE TOP FOR THE SUBJECTS REGISTERED BY YOU)

Options :

6406533039810. ✔ YES

6406533039811. ✖ NO

Sub-Section Number : 2

Sub-Section Id : 640653133725

Question Shuffling Allowed : Yes

Question Number : 261 Question Id : 640653902555 Question Type : MCQ Calculator : Yes Correct Marks : 3

Question Label : Multiple Choice Question

The eigenvalues of the covariance matrix of a centered dataset in $\mathbb{R}^5$ are $15, 5, 5, 0, 0$. Standard PCA is performed on this dataset. What is the variance captured by the top two principal components expressed as a percentage of total variance?

Options :

6406533039812. ✔ 80%

6406533039813. ✖ 60%

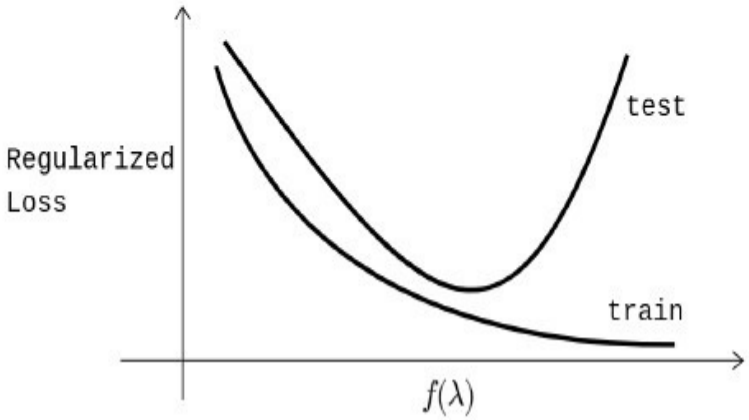
6406533039814. ✖ 20%

6406533039815. ✖ 15%

Question Number : 262 Question Id : 640653902556 Question Type : MCQ Calculator : Yes Correct Marks : 3

Question Label : Multiple Choice Question

Consider a regression problem that has a training and test dataset. Ridge regression is applied on the problem for various values of λ. The training and test loss are plotted against some function of λ, which we call $f(\lambda)$. Note that the continuous curves are obtained by connecting the points using a smooth curve. What is the most appropriate choice of $f(\lambda)$? Recall that the regularized loss is the sum of the SSE and the regularization term. Note that SSE is the sum of squared errors.



Options :

6406533039816. ✔ $\frac{1}{\lambda}$

6406533039817. ✖ λ

6406533039818. ✖ λ^2

6406533039819. ✖ $\log(\lambda)$

Question Number : 263 Question Id : 640653902557 Question Type : MCQ Calculator : Yes Correct Marks : 3

Question Label : Multiple Choice Question

Match the characteristics given below with the appropriate ensemble technique.

1. Decision stumps

2. Deep decision trees

3. Parallel execution

4. Sequential execution

Options :

6406533039820. ✔ Bagging → (2), (3); Boosting → (1), (4)

6406533039821. ✖ Bagging → (1), (4); Boosting → (2), (3)

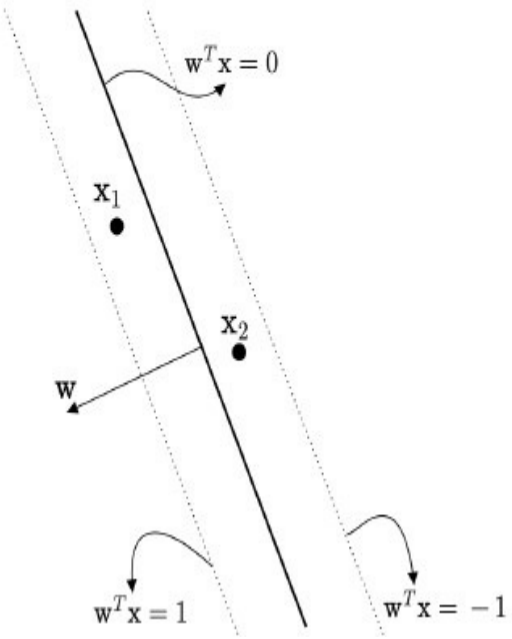
6406533039822. ✖ Bagging → (1), (3); Boosting → (2), (4)

6406533039823. ✖ Bagging → (2), (4); Boosting → (1), (3)

Question Number : 264 Question Id : 640653902558 Question Type : MCQ Calculator : Yes Correct Marks : 3

Question Label : Multiple Choice Question

Consider a hard-margin SVM that has been trained on a linearly separable dataset with positive margin. Two test data-points are given below along with the decision boundary and the supporting hyperplanes. Which of the following is true?



Options :

6406533039824. ✔ The predicted labels for x_1 and x_2 are 1 and −1 respectively.

6406533039825. ✖ The predicted labels for x_1 and x_2 are −1 and 1 respectively.

6406533039826. ✖ The predicted label for both data-points is 1.

6406533039827. ✖ The predicted label for both data-points is −1.

Question Number : 265 Question Id : 640653902559 Question Type : MCQ Calculator : Yes Correct Marks : 3

Question Label : Multiple Choice Question

For a dataset with features in $\mathbb{R}^3$, which of the following expresses the class conditional independence assumption in a Naive Bayes model? $p(\cdot)$ denotes probability.

Options :

6406533039828. ✔ $p((x_1, x_2, x_3) \mid y) = p(x_1 \mid y) \cdot p(x_2 \mid y) \cdot p(x_3 \mid y)$

6406533039829. ✖ $p((x_1, x_2, x_3), y) = p(y) \cdot p(x_1) \cdot p(x_2) \cdot p(x_3)$

6406533039830. ✖ $p((x_1, x_2, x_3) \mid y) = \frac{p((x_1, x_2, x_3), y)}{p(y)}$

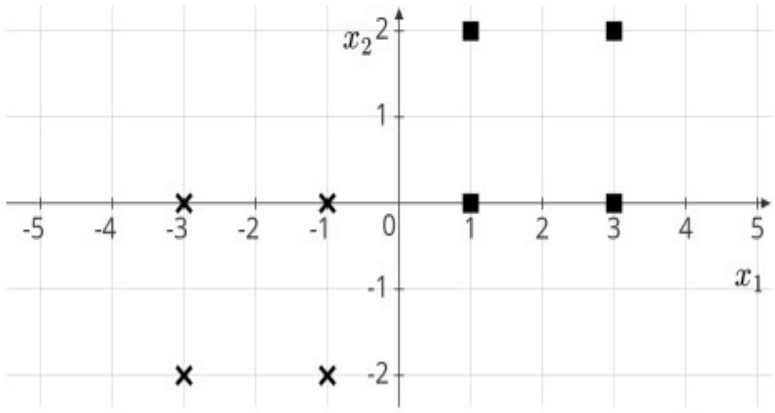
6406533039831. ✖ $p(y \mid (x_1, x_2, x_3)) = \frac{p((x_1, x_2, x_3), y)}{p(x_1, x_2, x_3)}$

Question Number : 266 Question Id : 640653902560 Question Type : MCQ Calculator : Yes

Correct Marks : 3

Question Label : Multiple Choice Question

The result of k-means clustering on a dataset of eight points is displayed below. Four points belong to the cluster denoted by the ■ symbol and the rest belong to the cluster denoted by the × symbol. The cluster boundary is a line such that all points on it could belong to either of the two clusters. Which of the following is the equation of the cluster boundary?



Options :

6406533039832. ✔ $2x_1 + x_2 = 0$

6406533039833. ✖ $x_1 - 2x_2 = 0$

6406533039834. ✖ $x_1 + x_2 = 0$

6406533039835. ✖ $x_1 + 2x_2 = 0$

Sub-Section Number : 3

Sub-Section Id : 640653133726

Question Shuffling Allowed : Yes

Question Number : 267 Question Id : 640653902565 Question Type : SA Calculator : None

Correct Marks : 3

Question Label : Short Answer Question

A hard-margin SVM is trained on a linearly separable dataset with a positive margin. The features are in $\mathbb{R}^2$. The optimal weight vector is $\begin{bmatrix}3\\4\end{bmatrix}$. Find the distance between the two supporting hyperplanes.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

0.4

Question Number : 268 Question Id : 640653902566 Question Type : SA Calculator : None Correct Marks : 3

Question Label : Short Answer Question

Consider a dataset for an unsupervised learning problem in which each data-point is either 1 or 0. This dataset is modeled using a Bernoulli distribution with parameter p. The MLE for p is 0.25. If the number of ones in the dataset is 10, find the number of zeros.

_____

Response Type : Numeric
Evaluation Required For SA : Yes
Show Word Count : Yes
Answers Type : Equal
Text Areas : PlainText
Possible Answers :

30

Question Number : 269 Question Id : 640653902567 Question Type : SA Calculator : None Correct Marks : 3

Question Label : Short Answer Question

Consider a decision stump (parent with two children). The parent node has 200 data-points out of which 50 belong to the positive class. The left child has 100 data-points out of which 50 belong to the positive class. Find the information gain. Use $\log_2$. Enter your answer correct to three decimal places.

_____

Response Type : Numeric
Evaluation Required For SA : Yes
Show Word Count : Yes
Answers Type : Range
Text Areas : PlainText
Possible Answers :

0.26 to 0.37

Sub-Section Number : 4
Sub-Section Id : 640653133727
Question Shuffling Allowed : Yes

Question Number : 270 Question Id : 640653902562 Question Type : MSQ Calculator : Yes Correct Marks : 3 Max. Selectable Options : 0

Question Label : Multiple Select Question

Consider $k : \mathbb{R}^d \times \mathbb{R}^d \to \mathbb{R}$, a polynomial kernel of degree p. If the kernel always outputs a non-negative value, which of the following are possible values for p?

Options :

6406533039840. ✔ 2

6406533039841. ✔ 4

6406533039842. ✖ 3

6406533039843. ✖ 5

Question Number : 271 Question Id : 640653902563 Question Type : MSQ Calculator : Yes Correct Marks : 3 Max. Selectable Options : 0

Question Label : Multiple Select Question

Consider a training dataset of 100 points for a binary classification problem with the following structure.

- The features are in $\mathbb{R}^2$ and the labels are in $\{-1, 1\}$
- For every data-point $((x_1, x_2), y)$ in the training dataset, $x_1 x_2 > 0$ and $x_1 y > 0$.

Which of the following statements are true?

Options :

6406533039844. ✔ The dataset is linearly separable with a positive margin.

6406533039845. ✔ The perceptron algorithm will terminate after a finite number of iterations when trained on this dataset.

6406533039846. ✖ The dataset is linearly separable, but the margin may be zero.

6406533039847. ✖ The dataset is not linearly separable.

Question Number : 272 Question Id : 640653902564 Question Type : MSQ Calculator : Yes Correct Marks : 3 Max. Selectable Options : 0

Question Label : Multiple Select Question

Consider a logistic regression model trained for a binary classification problem with features in $\mathbb{R}^2$ and labels in $\{1, 0\}$. The probability that the test point $\begin{bmatrix} 1 \\ 1 \end{bmatrix}$ belongs to class 1 is equal to $\frac{1}{1+e^2}$. Which of the following could be the weight vector of the logistic regression classifier? Select all possible answers.

Options :

6406533039848. ✔ $\begin{bmatrix} -1 \\ -1 \end{bmatrix}$

6406533039849. ✔ $\begin{bmatrix} 1 \\ -3 \end{bmatrix}$

6406533039850. ✖ $\begin{bmatrix}1\\1\end{bmatrix}$

6406533039851. ✖ $\begin{bmatrix}3\\-1\end{bmatrix}$

Sub-Section Number : 5

Sub-Section Id : 640653133728

Question Shuffling Allowed : No

Question Id : 640653902568 Question Type : COMPREHENSION Sub Question Shuffling Allowed : No Group Comprehension Questions : No Question Pattern Type : NonMatrix Calculator : None

Question Numbers : (273 to 275)

Question Label : Comprehension

Consider a linearly separable dataset with a positive margin. The symbol α_i^* in the context of SVMs has its usual meaning. Are the following statements true or false?

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 273 Question Id : 640653902569 Question Type : MCQ Calculator : Yes Correct Marks : 1

Question Label : Multiple Choice Question

The weight vector output by the perceptron algorithm on this dataset can be expressed as a linear combination of the data-points where the coefficients of the linear combination are integers.

Options :

6406533039855. ✔ TRUE

6406533039856. ✖ FALSE

Question Number : 274 Question Id : 640653902570 Question Type : MCQ Calculator : Yes Correct Marks : 1

Question Label : Multiple Choice Question

In the case of a hard-margin SVM, if $\alpha_i^* \geqslant 0$, the point $\mathbf{x}_i$ is a support vector.

Options :

6406533039857. ✖ TRUE

6406533039858. ✔ FALSE

Question Number : 275 Question Id : 640653902571 Question Type : MCQ Calculator : Yes Correct Marks : 1

Question Label : Multiple Choice Question

If a soft-margin SVM is trained on this dataset, the optimal weight vector it returns will be the same as the one returned by a hard-margin SVM, irrespective of the value of the hyperparameter C.

Options :

6406533039859. ✖ TRUE

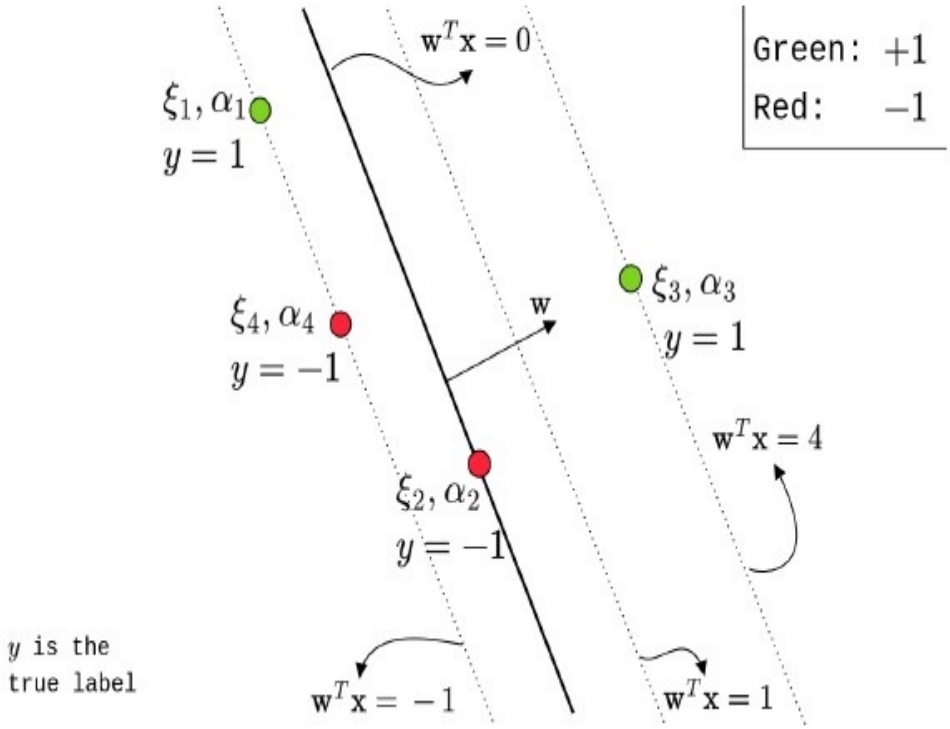
6406533039860. ✔ FALSE

Question Id : 640653902572 Question Type : COMPREHENSION Sub Question Shuffling Allowed : No Group Comprehension Questions : No Question Pattern Type : NonMatrix Calculator : None

Question Numbers : (276 to 281)

Question Label : Comprehension

Consider a soft-margin SVM with $C = 3$ that has been trained on a dataset with features in $\mathbb{R}^2$. The decision boundary and the supporting hyperplanes are displayed below. Four points from the training dataset are also displayed. Green data-points belong to class 1 and red data-points belong to class -1. Symbols ξ and α have their usual meanings. Assume that $\mathbf{w}, \xi_i, \alpha_i$ represent the optimal values.



Based on the above data, answer the given subquestions.

Sub questions

Question Number : 276 Question Id : 640653902573 Question Type : SA Calculator : None

Correct Marks : 0.5

Question Label : Short Answer Question

What is ξ_1? _____

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

2

Question Number : 277 Question Id : 640653902574 Question Type : SA Calculator : None

Correct Marks : 0.5

Question Label : Short Answer Question

What is ξ_2? _____

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

1

Question Number : 278 Question Id : 640653902575 Question Type : SA Calculator : None

Correct Marks : 0.5

Question Label : Short Answer Question

What is ξ_3? _____

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

0

Question Number : 279 Question Id : 640653902576 Question Type : SA Calculator : None

Correct Marks : 0.5

Question Label : Short Answer Question

What is α_1? If it cannot be determined exactly, enter -1. _____

Response Type : Numeric
Evaluation Required For SA : Yes
Show Word Count : Yes
Answers Type : Equal
Text Areas : PlainText
Possible Answers :
3

Question Number : 280 Question Id : 640653902577 Question Type : SA Calculator : None Correct Marks : 0.5
Question Label : Short Answer Question

What is α_3? If it cannot be determined exactly, enter -1. _____

Response Type : Numeric
Evaluation Required For SA : Yes
Show Word Count : Yes
Answers Type : Equal
Text Areas : PlainText
Possible Answers :
0

Question Number : 281 Question Id : 640653902578 Question Type : SA Calculator : None Correct Marks : 0.5
Question Label : Short Answer Question

What is α_4? If it cannot be determined exactly, enter -1. _____

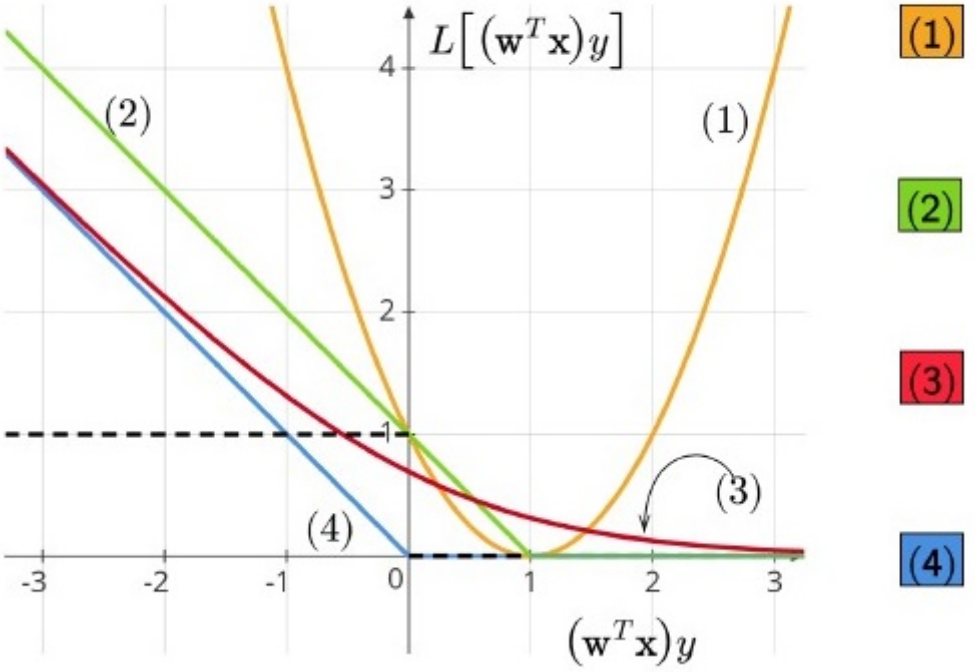
Response Type : Numeric
Evaluation Required For SA : Yes
Show Word Count : Yes
Answers Type : Equal
Text Areas : PlainText
Possible Answers :
-1

Question Id : 640653902579 Question Type : COMPREHENSION Sub Question Shuffling Allowed : No Group Comprehension Questions : No Question Pattern Type : NonMatrix Calculator : None

Question Numbers : (282 to 286)

Question Label : Comprehension

The convex surrogates for the 0-1 loss are displayed below:



Based on the above data, answer the given subquestions.

Sub questions

Question Number : 282 Question Id : 640653902580 Question Type : SA Calculator : None Correct Marks : 0.5

Question Label : Short Answer Question

Enter the number corresponding to the logistic loss. _____

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

3

Question Number : 283 Question Id : 640653902581 Question Type : SA Calculator : None Correct Marks : 0.5

Question Label : Short Answer Question

Enter the number corresponding to the (SVM) hinge loss. _____

Response Type : Numeric
Evaluation Required For SA : Yes
Show Word Count : Yes
Answers Type : Equal
Text Areas : PlainText
Possible Answers :
2

Question Number : 284 Question Id : 640653902582 Question Type : SA Calculator : None Correct Marks : 0.5
Question Label : Short Answer Question
Enter the number corresponding to the perceptron loss. _____
Response Type : Numeric
Evaluation Required For SA : Yes
Show Word Count : Yes
Answers Type : Equal
Text Areas : PlainText
Possible Answers :
4

Question Number : 285 Question Id : 640653902583 Question Type : SA Calculator : None Correct Marks : 0.5
Question Label : Short Answer Question
Enter the number corresponding to the squared loss._____
Response Type : Numeric
Evaluation Required For SA : Yes
Show Word Count : Yes
Answers Type : Equal
Text Areas : PlainText
Possible Answers :
1

Question Number : 286 Question Id : 640653902584 Question Type : MCQ Calculator : Yes Correct Marks : 1
Question Label : Multiple Choice Question
Which of the following statements is true? $\ln = \log_e$.
Options :
6406533039871. ✔

The logistic loss and the (SVM) hinge loss intersect when $(\mathbf{w}^T\mathbf{x})y = \ln(e-1)$.

6406533039872. ✖ The logistic loss and the (SVM) hinge loss do not intersect.

6406533039873. ✖ The logistic loss and the (SVM) hinge loss intersect when $(\mathbf{w}^T\mathbf{x})y = \ln(1-\frac{1}{e})$.

6406533039874. ✖ The logistic loss and the (SVM) hinge loss intersect when $(\mathbf{w}^T\mathbf{x})y = \frac{1}{e}$.

Question Id : 640653902585 Question Type : COMPREHENSION Sub Question Shuffling Allowed : No Group Comprehension Questions : No Question Pattern Type : NonMatrix Calculator : None

Question Numbers : (287 to 289)

Question Label : Comprehension

Consider the following architecture of a neural network for a binary classification problem:

Layer type	Number of neurons
Input	5
Hidden layer-1	10
Hidden layer-2	10
Output	1

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 287 Question Id : 640653902586 Question Type : SA Calculator : None Correct Marks : 1

Question Label : Short Answer Question

How many learnable parameters does this network have? Ignore the biases in the computation.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes
Answers Type : Equal
Text Areas : PlainText
Possible Answers :
160

Question Number : 288 Question Id : 640653902587 Question Type : MCQ Calculator : Yes
Correct Marks : 1
Question Label : Multiple Choice Question
What is the most appropriate choice of activation function for the output layer if the binary cross-entropy loss is used?
Options :
6406533039876. ✔ Sigmoid
6406533039877. ✖ Linear
6406533039878. ✖ ReLU

Question Number : 289 Question Id : 640653902588 Question Type : MCQ Calculator : Yes
Correct Marks : 1
Question Label : Multiple Choice Question

For a particular data-point, the activations after the first hidden layer in the forward pass is given to be $[0.2 \quad 0.1 \quad 1.5 \quad 0.3 \quad 0.1 \quad 0 \quad 0.8 \quad 1.2 \quad 1 \quad 0]^T$.

What is the activation function used in the first hidden layer?

Options :
6406533039879. ✔ ReLU
6406533039880. ✖ Sigmoid

Sub-Section Number : 6
Sub-Section Id : 640653133729
Question Shuffling Allowed : Yes

Question Number : 290 Question Id : 640653902561 Question Type : MCQ Calculator : Yes
Correct Marks : 2
Question Label : Multiple Choice Question

Consider a linear regression problem. Which of the following is the gradient of the SSE function with respect to $\mathbf{w} \in \mathbb{R}^d$, the weight vector, for a single data-point $\mathbf{x} \in \mathbb{R}^d$? y is the true label and $\hat{y}$ is the predicted label. Note that SSE is the sum of squared errors.

Options :

6406533039836. ✔ $(\hat{y} - y)\mathbf{x}$

6406533039837. ✖ $(\mathbf{w}^T\mathbf{x})\mathbf{w}$

6406533039838. ✖ $\hat{y}\mathbf{x}$

6406533039839. ✖ $\mathbf{x}y$

MLP

Section Id :	64065364081
Section Number :	13
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	33
Number of Questions to be attempted :	33
Section Marks :	100
Display Number Panel :	Yes
Section Negative Marks :	0
Group All Questions :	No
Enable Mark as Answered Mark for Review and Clear Response :	No
Maximum Instruction Time :	0
Sub-Section Number :	1
Sub-Section Id :	640653133730
Question Shuffling Allowed :	No

Question Number : 291 Question Id : 640653902589 Question Type : MCQ Calculator : Yes
Correct Marks : 0

Question Label : Multiple Choice Question

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CROSS CHECK YOUR HALL TICKET TO CONFIRM THE SUBJECTS TO BE WRITTEN.

(IF IT IS NOT THE CORRECT SUBJECT, PLS CHECK THE SECTION AT THE TOP FOR THE SUBJECTS REGISTERED BY YOU)

Options :