6406532577709. ✔ For the endpoint, http://127.0.0.1:8080/#/records/2, The browser will render:

Pianobind has 13 songs across 5 genres.

6406532577710. ✔ For the endpoint, http://127.0.0.1:8080/#/records, The browser will render:

Unknown record!

6406532577711. ✖ For the endpoint, http://127.0.0.1:8080/#/records/3, The browser will render:

Unknown record!

MLT

Section Id :	64065353268
Section Number :	12
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	12
Number of Questions to be attempted :	12
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 :	Yes
Maximum Instruction Time :	0
Sub-Section Number :	1
Sub-Section Id :	640653112631
Question Shuffling Allowed :	No
Is Section Default? :	null

Question Number : 189 Question Id : 640653770608 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

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 :

6406532577716. ✔ YES

6406532577717. ✖ NO

Sub-Section Number :	2
Sub-Section Id :	640653112632
Question Shuffling Allowed :	No
Is Section Default? :	null

Question Id : 640653770625 Question Type : COMPREHENSION Sub Question Shuffling Allowed : No Group Comprehension Questions : No Question Pattern Type : NonMatrix Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Question Numbers : (190 to 191)

Question Label : Comprehension

Consider a binary classification problem with a training dataset of 80 points, evenly distributed between two classes (40 points in each class). You decide to train a k-NN algorithm with $k = 3$. Each point is considered its own neighbor during classification.

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 190 Question Id : 640653770626 Question Type : SA Calculator : None

Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 3

Question Label : Short Answer Question

What is the minimum number of misclassifications that can occur in the training dataset when using this k-NN algorithm?

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

0

Question Number : 191 Question Id : 640653770627 Question Type : SA Calculator : None

Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 2

Question Label : Short Answer Question

Assuming there are outliers, the decision boundary becomes smoother with increasing value of k in a k-NN algorithm (Fill in 1 for yes and 0 for no)

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

1

Sub-Section Number :	3
Sub-Section Id :	640653112633
Question Shuffling Allowed :	No
Is Section Default? :	null

Question Id : 640653770609 Question Type : COMPREHENSION Sub Question Shuffling Allowed : No Group Comprehension Questions : No Question Pattern Type : NonMatrix Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Question Numbers : (192 to 193)

Question Label : Comprehension

Consider a regression problem where you are tasked with predicting the sale prices of houses based on their square footage. You decide to experiment with two different models:

$$\text{Model } P : \hat{y}_i = w_0 + w_1 x$$
$$\text{Model } Q : \hat{y}_i = w_0 + w_1 x + w_2 x^2$$

The training dataset consists of information on 200 houses, and you use the models to make predictions on a test dataset of 50 houses. The Mean Squared Error (MSE) is chosen as the evaluation metric.

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 192 Question Id : 640653770610 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 3

Question Label : Multiple Choice Question

Considering the specific context of predicting house prices based on square footage, which model is more likely to provide accurate predictions on the training dataset?

Options :

6406532577718. ✖ Model *P*

6406532577719. ✔ Model *Q*

6406532577720. ✖ Both models are equally likely to provide accurate predictions

6406532577721. ✖ It depends on the distribution of house prices in the dataset

Question Number : 193 Question Id : 640653770611 Question Type : MSQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 3 Max. Selectable Options : 0

Question Label : Multiple Select Question

Identify the factors that could influence the model's performance on the training dataset in this housing price prediction scenario. Select all correct statements:

Options :

6406532577722. ✔ Model *P* may struggle to capture non-linear relationships present in house price data.

6406532577723. ✔ Model *Q* might be sensitive to outliers in the square footage variable.

6406532577724. ✖ The choice between Model *P* and Model *Q* depends on the budget constraints of potential homebuyers.

6406532577725. ✖ Model *Q* will always perform well on the test dataset.

Question Id : 640653770622 Question Type : COMPREHENSION Sub Question Shuffling Allowed : No Group Comprehension Questions : No Question Pattern Type : NonMatrix Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Question Numbers : (194 to 195)

Question Label : Comprehension

Consider a naive Bayes model is trained on the following data matrix X of shape (d, n) and corresponding label vector y:

$$X = \begin{bmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 1 \\ 0 & 1 & 1 & 0 \end{bmatrix} \quad y = [1 \quad 0 \quad 1 \quad 1]^T$$

Assume that $\hat{p}$ and $\hat{p}_j^{y_i}$ are estimates for $P(y = 1)$ and $P(f_j = 1|y = y_i)$, respectively. Here, $f_i;\ i = 1, 2, 3$ is the i^{th} feature.

These parameters are estimated using MLE.

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 194 Question Id : 640653770623 Question Type : SA Calculator : None

Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 3

Question Label : Short Answer Question

Calculate the value of $\hat{p}_2^1$

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

0.30 to 0.35

Question Number : 195 Question Id : 640653770624 Question Type : SA Calculator : None

Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 3

Question Label : Short Answer Question

Calculate the value of $\hat{p}_1^1$

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

0.30 to 0.35

Sub-Section Number :	4
Sub-Section Id :	640653112634
Question Shuffling Allowed :	No
Is Section Default? :	null

Question Id : 640653770614 Question Type : COMPREHENSION Sub Question Shuffling Allowed : No Group Comprehension Questions : No Question Pattern Type : NonMatrix Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Question Numbers : (196 to 197)

Question Label : Comprehension

Consider a dataset with the following data points and the target variable:

Sample No	x	y
1	3	8
2	0	3
3	5	12
4	6	13

The linear regression model is given by $y = w_0 + w_1 x$. Assume that the Leave-One-Out Cross-Validation technique is applied.

Based on the above data, answer the given subquestions.

Sub questions

Question Number : 196 Question Id : 640653770615 Question Type : SA Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4

Question Label : Short Answer Question

Enter the value of w_1 obtained when the 3rd sample is used as the validation data point.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

1.65 to 1.70

Question Number : 197 Question Id : 640653770616 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4

Question Label : Multiple Choice Question

What will be the predicted value for the left-out data point?

Options :

6406532577732. ✖ 12

6406532577733. ✖ 13

6406532577734. ✖ 12.3

6406532577735. ✔ 11.3

6406532577736. ✖ None of these

Sub-Section Number :	5
Sub-Section Id :	640653112635
Question Shuffling Allowed :	Yes
Is Section Default? :	null

Question Number : 198 Question Id : 640653770613 Question Type : SA Calculator : None

Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 3

Question Label : Short Answer Question

Kernel regression with a polynomial kernel of degree three is applied on a data set $\{X, y\}$. Let the weight vector be given by

$$w = \phi(X)[2.3, -1.0, 0.4, -0.7]^T$$

Here $\phi(X)$ is the transformed data matrix whose i^{th} column is $\phi(x_i)$. What will be the prediction for the data point $[0, 0, 0, 0]^T$?

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

1

Question Number : 199 Question Id : 640653770621 Question Type : SA Calculator : None

Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 3

Question Label : Short Answer Question

Suppose you have a five-class classification problem where class label $y \in (0, 1, 2, 3, 4)$ and each training example x_i has binary features $f_1, f_2, f_3 \in (0, 1)$. How many parameters do we need to know to classify an example using Naive Bayes classifier?

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

19 to 20

Sub-Section Number : 6

Sub-Section Id : 640653112636

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 200 Question Id : 640653770612 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 3

Question Label : Multiple Choice Question

Let X be the data matrix of shape (d, n) and y be the corresponding label vector. A linear regression model of the form $\hat{y}_i = w^T x_i$ is fit using the squared error on the same dataset. If the solution w^* to the optimization problem is orthogonal to the subspace spanned of the data point (columns of matrix X), what will be the squared error?

Options :

6406532577726. ✖ 0

6406532577727. ✖ 1

6406532577728. ✔ $||y||^2$

6406532577729. ✖ Insufficient information to answer

Sub-Section Number : 7

Sub-Section Id : 640653112637

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 201 Question Id : 640653770617 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4

Question Label : Multiple Choice Question

Given a design matrix $X \in \mathbb{R}^{d \times n}$ and a target vector $Y \in \mathbb{R}^{n \times 1}$, where d represents the number of features, n represents the number of data points, and the data is defined as:

$$X = \begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}$$

$$Y = \begin{bmatrix} 3 \\ 5 \end{bmatrix}$$

Calculate the coefficients β for Ridge regression with $\lambda = 1$.

Options :

6406532577737. ✖ $\beta = [0.5, 0.5]$

6406532577738. ✖ $\beta = [1, 0.5]$

6406532577739. ✔ $\beta = [0.54, 0.88]$

6406532577740. ✖ $\beta = [0.67, 0.33]$

6406532577741. ✖ None of these

Question Number : 202 Question Id : 640653770618 Question Type : MCQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4

Question Label : Multiple Choice Question

The training dataset for a binary classification problem is as follows:

$$\{ (\mathbf{u}, 1), \quad (-2\mathbf{u}, 0), \quad (3\mathbf{u}, 1), \quad (-4\mathbf{u}, 0) \}$$

where $\mathbf{u} \in \mathbb{R}^d$ is a constant, and the labels belong to $0, 1$. Let $\mathbf{w}$ be the weight vector of a linear classifier. What condition should the weight vector satisfy for the zero-one loss to be zero on this dataset?

Options :

6406532577742. ✖ $\mathbf{w}^T\mathbf{u} < 0$

6406532577743. ✔ $\mathbf{w}^T\mathbf{u} > 0$

6406532577744. ✖ $\mathbf{w}^T\mathbf{u} = 0$

6406532577745. ✖ We can never find a $\mathbf{w}$ for which the zero-one loss becomes zero on this dataset.

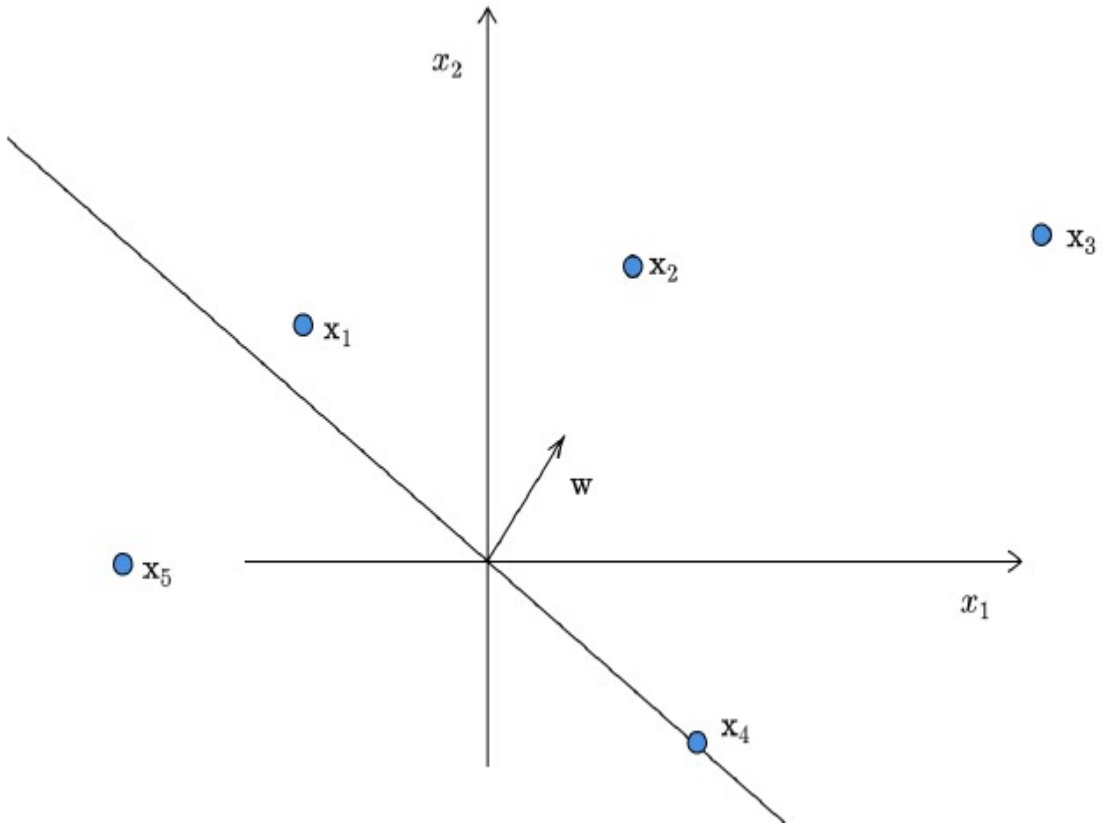
Sub-Section Number :	8
Sub-Section Id :	640653112638
Question Shuffling Allowed :	Yes
Is Section Default? :	null

Question Number : 203 Question Id : 640653770619 Question Type : MSQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Max. Selectable Options : 0

Question Label : Multiple Select Question

Consider the following data-points in a binary classification problem. **w** is the weight vector corresponding to a linear classifier. The labels are +1 and −1.



Which of the following statements are true?

Options :

6406532577746. ✔ $0 < \mathbf{w}^T\mathbf{x}_1 < \mathbf{w}^T\mathbf{x}_2 < \mathbf{w}^T\mathbf{x}_3$

6406532577747. ✔ $\mathbf{w}^T\mathbf{x}_4 = 0$

6406532577748. ✖ $0 < \mathbf{w}^T\mathbf{x}_2 < \mathbf{w}^T\mathbf{x}_1 < \mathbf{w}^T\mathbf{x}_3$

6406532577749. ✔ $\mathbf{w}^T x_5 < 0$

6406532577750. ✖ $\mathbf{w}^T x_3 < 0$

Question Number : 204 Question Id : 640653770620 Question Type : MSQ Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Max. Selectable Options : 0

Question Label : Multiple Select Question

Select all true statements.

Options :

6406532577751. ✔ In Decision tree, if a question Q_1 is "better" than question Q_2, then information gains for Q_1 is greater than information gains Q_2 always.

6406532577752. ✔ The training dataset is required while predicting the label of a test-point in the k-NN algorithm.

6406532577753. ✖ A question of the form $f_k \leq \theta$ always partitions the dataset into two non-empty sets.

6406532577754. ✔ The depth of the tree is a hyperparameter and has to be chosen using cross validation.

6406532577755. ✖ Decision trees are prone to overfit if the maximum depth is set too low.

MLP

Section Id :	64065353269
Section Number :	13
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	23
Number of Questions to be attempted :	23
Section Marks :	50
Display Number Panel :	Yes
Section Negative Marks :	0