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Started on	Monday, 27 January 2025, 10:45 AM
State	Finished
Completed on	Monday, 27 January 2025, 10:51 AM
Time taken	5 mins 55 secs
Grade	20.00 out of 20.00 (100%)

Question **1**

Correct

Mark 2.00 out of 2.00

Flag question

If $k=1$ in KNN, which of the following is true?

Select one:

- ☐ The model has a high bias and underfits the data.
- ☒ The model is highly flexible, captures noise, and is prone to overfitting. ✓
- ☐ The model generalizes well to unseen data.
- ☐ The model produces smooth decision boundaries.

Your answer is correct.

The correct answer is: The model is highly flexible, captures noise, and is prone to overfitting.

Question **2**

Correct

Mark 2.00 out of 2.00

Flag question

A KNN regressor is used with $k=4$. The target values of the nearest neighbours are [5, 7, 9, 11]. What will be the predicted value?

Select one:

- ☒ 8 ✓
- ☐ 10
- ☐ 11
- ☐ 9

Your answer is correct.

The correct answer is: 8

Question **3**

Correct

Mark 2.00 out of 2.00

Flag question

For a dataset with 1000 samples, a KNN model is trained using $k=5$. How many distances are computed during prediction for 1 test sample?

Select one:

- ☐ 5000
- ☐ 5
- ☒ 1000 ✓
- ☐ 1005

Your answer is correct.

The correct answer is: 1000

Question **4**

Correct

Mark 2.00 out of 2.00

Flag question

Which preprocessing step is essential for KNN to work effectively?

Select one:

- ☐ Performing hyperparameter tuning
- ☐ Using an ensemble of models
- ☐ Splitting data into training and validation sets
- ☒ Normalization or standardization of data ✓

Your answer is correct.

The correct answer is: Normalization or standardization of data

Question **5**

Correct

Mark 2.00 out of 2.00

Flag question

A KNN classifier uses $k=3$ and predicts based on the class labels of the neighbors. If the nearest neighbors of a test point belong to classes [1, 2, 2], what will the predicted class be?

Select one:

- ☐ 1
- ☐ 4
- ☒ 2 ✓
- ☐ 3

Your answer is correct.

The correct answer is: 2

Question **6**

Correct

Mark 2.00 out of 2.00

Flag question

Which distance metric is most commonly used in KNN?

Select one:

- ☐ Cosine similarity
- ☐ Jaccard index
- ☒ Euclidean distance ✓
- ☐ Manhattan distance

Your answer is correct.

The correct answer is: Euclidean distance

Question **7**

Correct

Mark 2.00 out of 2.00

Flag question

What is the primary factor that affects the performance of the KNN algorithm?

Select one:

- ☐ The activation function used.
- ☒ The value of k (number of neighbors). ✓
- ☐ The number of features in the dataset.
- ☐ The number of hidden layers.

Your answer is correct.

The correct answer is: The value of k (number of neighbors).

Question **8**

Correct

Mark 2.00 out of 2.00

Flag question

What is the role of the distance metric in KNN?

Select one:

- ☐ It is used only for regression tasks.
- ☐ It determines the optimal value of k .
- ☒ It determines the similarity between data points. ✓
- ☐ It determines how neighbours are weighted during voting.

Your answer is correct.

The correct answer is: It determines the similarity between data points.

Question **9**

Correct

Mark 2.00 out of 2.00

Flag question

Calculate the Euclidean distance between two points $P(1,2,3)$ and $Q(4,6,8)$

Select one:

- ☐ $\sqrt{55}$
- ☐ $\sqrt{35}$
- ☐ 10
- ☒ $\sqrt{50}$ ✓

Your answer is correct.

The correct answer is: $\sqrt{50}$

Question **10**

Correct

Mark 2.00 out of 2.00

Flag question

How does KNN handle categorical features?

Select one:

- ☐ It ignores categorical features in the dataset.
- ☐ It uses feature hashing to handle categorical variables.
- ☒ It uses one-hot encoding for categorical variables. ✓
- ☐ It computes distance directly on categorical values.

Your answer is correct.

The correct answer is: It uses one-hot encoding for categorical variables.

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