

Kernels and Decision Trees

Your Name *

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What is/are true about kernel in SVM? 1. Kernel function map low dimensional data to high dimensional space 2. It's a similarity function 1 point

- 1
- 2
- 1 and 2
- None of the above

Using the kernel trick, one can get non-linear decision boundaries using algorithms designed originally for linear models. 1 point

- True
- False

What is the primary purpose of using a kernel in SVM?

1 point

- To transform non-linear data into a higher-dimensional space
- To increase training data
- To avoid computing the feature map explicitly
- To reduce overfitting

In SVMs with RBF kernel, increasing the gamma value will:

1 point

- Make the decision boundary more complex
- Make the model more sensitive to individual data points
- Increase the margin width
- Reduce the model's capacity to overfit

In dual SVM formulation, kernels are used to:

1 point

- Compute distances between feature vectors
- Replace dot products in feature space
- Select support vectors
- Replace the loss function

What does “conditional entropy” measure in decision trees?

1 point

- The randomness of the target label overall
- The uncertainty of the target given a feature split
- The information gain after splitting on a feature
- The total number of branches from a node

Given a simple dataset, how do you select the best feature to split on?

1 point

- Choose the feature with the fewest missing values
- Choose the feature with the highest information gain
- Choose the feature with the smallest entropy
- Choose the feature with the highest variance

What happens when a decision tree grows too deep?

1 point

- The training accuracy increases
- The test accuracy always improves
- The model becomes more prone to overfitting
- The tree may start splitting on noise

Suppose feature A gives an information gain of 0.2 and feature B gives 0.5. Which feature should ID3 select for the split? 1 point

- Feature A
- Feature B
- Whichever appears earlier in the dataset
- Whichever leads to smaller leaf nodes

What does information gain measure? 1 point

- How much entropy increases after a split
- How much uncertainty is reduced by knowing the feature
- How many examples fall into each leaf
- How well a feature separates the data

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