Module 4 Quiz

Quiz, 10 questions

> 1
> point

1.

Which of the following is an example of clustering?

- ○ Compress elongated clouds of data into more spherical representations
- ○ Creating a new representation of the data with fewer features
- ● Separate the data into distinct groups by similarity
- ○ Accumulate data into groups based on labels

> 1
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2.

Which of the following are advantages to using decision trees over other models? (Select all that apply)

- ☐ Decision trees can learn complex statistical models using a variety of kernel functions
- ☑ Trees are easy to interpret and visualize
- ☑ Trees often require less preprocessing of data
- ☐ Trees are naturally resistant to overfitting

> 1
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3.

What is the main reason that each tree of a random forest only looks at a random subset of the features when building each node?

- ● To improve generalization by reducing correlation among the trees and making the model more robust to bias.
- ○ To increase interpretability of the model
- ○ To reduce the computational complexity associated with training each of the trees needed for the random forest.
- ○ To learn which features are not strong predictors

> 1
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4.

Which of the following supervised machine learning methods are greatly affected by feature scaling? (Select all that apply)

- ☐ Naive Bayes
- ☑ Neural Networks
- ☐ Decision Trees
- ☑ Support Vector Machines

☐ KNN **Module 4 Quiz**
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5.

Select which of the following statements are true.

☐ For having an audience interpret the fitted model, a **support vector machine** would be a better choice than a **decision tree**.

☐ For a fitted model that doesn't take up a lot of memory, **KNN** would be a better choice than **logistic regression.**

☐ For predicting future sales of a clothing line, **Linear regression** would be a better choice than a **decision tree regressor**.

☑ For a model that won't overfit a training set, **Naive Bayes** would be a better choice than a **decision tree**.

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6.

Match each of the prediction probabilities decision boundaries visualized below with the model that created them.
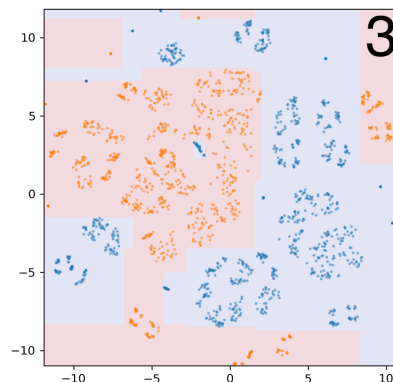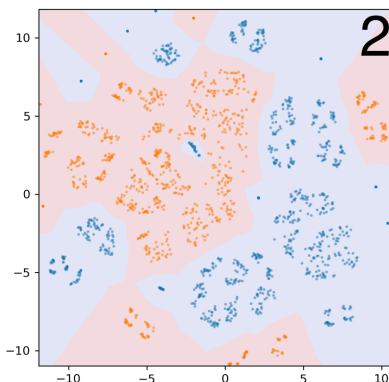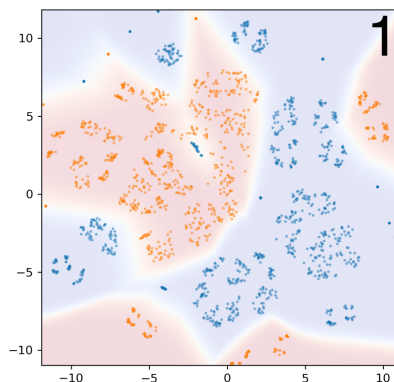
○ 1. KNN (k=1)

2. Neural Network

3. Decision Tree

● 1. Neural Network

2. KNN (k=1)

3. Decision Tree

○ 1. KNN (k=1)

2. Decision Tree
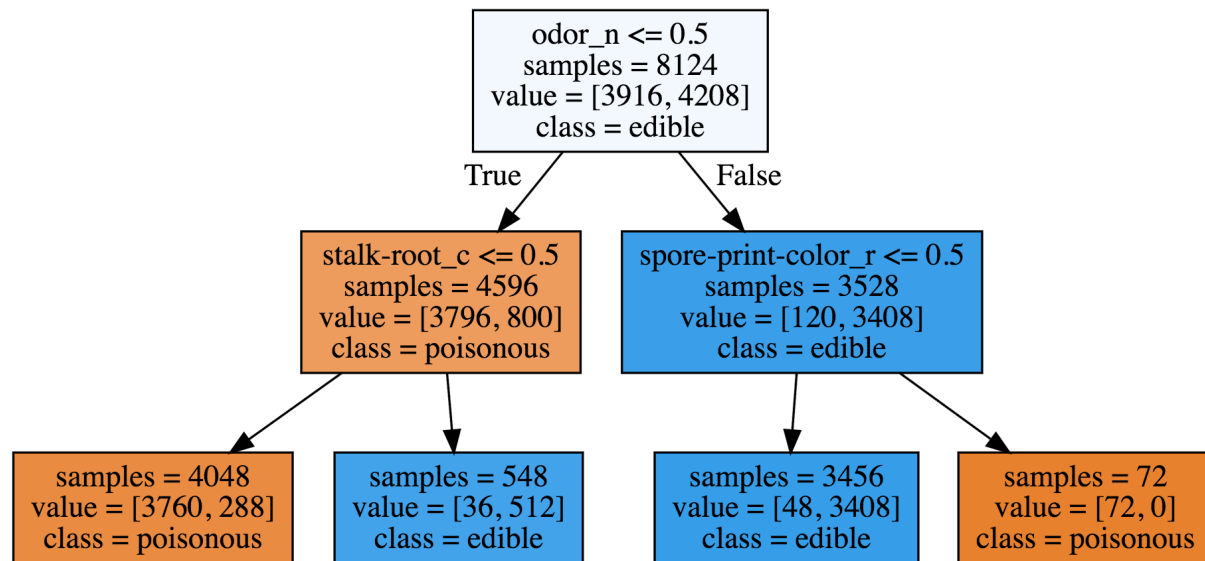
3. Neural Network

○ 1. Neural Network

2. Decision Tree

3. KNN (k=1)

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7.

A decision tree of depth 2 is visualized below. Using the `value` attribute of each leaf, find the accuracy score for the tree of depth 2 and the accuracy score for a tree of depth 1.

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odor_n <= 0.5
samples = 8124
value = [3916, 4208]
class = edible

True / False

stalk-root_c <= 0.5
samples = 4596
value = [3796, 800]
class = poisonous

spore-print-color_r <= 0.5
samples = 3528
value = [120, 3408]
class = edible

samples = 4048
value = [3760, 288]
class = poisonous

samples = 548
value = [36, 512]
class = edible

samples = 3456
value = [48, 3408]
class = edible

samples = 72
value = [72, 0]
class = poisonous

What is the improvement in accuracy between the model of depth 1 and the model of depth 2?

> 0.067

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8.

For the autograded assignment in this module, you will create a classifier to predict whether a given blight ticket will be paid on time (See the module 4 assignment notebook for a more detailed description). Which of the following features should be removed from the training of the model to prevent data leakage? (Select all that apply)

- ☑ compliance_detail - More information on why each ticket was marked compliant or non-compliant

- ☐ ticket_issued_date - Date and time the ticket was issued

- ☐ agency_name - Agency that issued the ticket

- ☐ collection_status - Flag for payments in collections

- ☑ grafitti_status - Flag for graffiti violations

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9.

Which of the following might be good ways to help prevent a data leakage situation?

- ☑ If time is a factor, remove any data related to the event of interest that doesn't take place prior to the event.

- ☐ Ensure that data is preprocessed outside of any cross validation folds.

- ☑ Remove variables that a model in production wouldn't have access to

- ☑ Sanity check the model with an unseen validation set

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10.
Given the neural network below, find the correct outputs for the given values of x1 and x2.

The neurons that are shaded have an activation threshold, e.g. the neuron with *>1?* will be activated and output 1 if the input is greater than 1 and will output 0 otherwise.

○
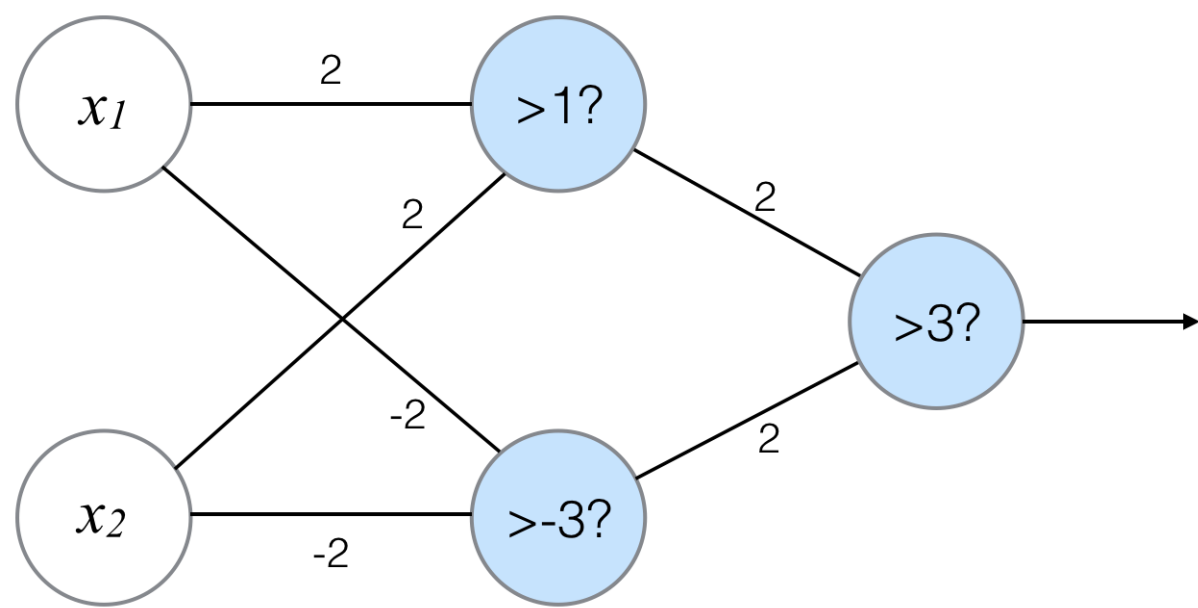
x1	x2	output
0	0	0
0	1	0
1	0	0
1	1	1

○

x1	x2	output
0	0	1
0	1	0
1	0	0
1	1	1

○

x1	x2	output
0	0	0
0	1	1
1	0	1
1	1	1

●

x1	x2	output
0	0	0
0	1	1
1	0	1