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Week 6 Quiz

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Q1

10.0/10.0 points (graded)

When a decision tree is fully grown, it is likely to overfit the training data.

☐ False

☒ True ✓

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You have used 1 of 1 attempt

Q2

10.0/10.0 points (graded)

You are trying to predict the average rainfall in California as a function of the measured currents and tides in the Pacific ocean in the previous six months. This is a:

☐ Classification problem

☒ Regression problem ✓

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Q3

10.0/10.0 points (graded)

The idea of boosting is to train weak learners on weighted training examples. Check all that apply.

- ☐ Give large weights to easy examples to get rid of them
- ☒ The classification output is a majority voting of all weak classifiers outputs
- ☒ Give large weights to hard examples to focus on those in the next steps



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Q4

10.0/10.0 points (graded)

A decision tree generated from an unbalanced training data may be biased towards the majority class. In other words, it will learn the majority class, will have a high accuracy, even though, it will be unable to predict the minority class examples correctly (e.g., a dataset of 95% negative examples and 5% positive examples).

- ☐ False
- ☒ True

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You have used 1 of 1 attempt

Q5

10.0/10.0 points (graded)

Check all that apply.

☐ Naive Bayes classifier models $p(y|x)$ and $p(y)$ and then used Bayes rule to obtain $p(x|y)$

☒ Naive Bayes classifier models $p(x|y)$ and $p(y)$ and then used Bayes rule to obtain $p(y|x)$

☐ Naive Bayes classifier models $p(x|y)$ and $p(x)$ and then used Bayes rule to obtain $p(x|y)$

☐ Naive Bayes classifier is a discriminative method.

☒ Naive Bayes classifier is a generative method.



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You have used 1 of 2 attempts

Q6

10.0/10.0 points (graded)

| a | b | f |
|-----|-----|-----|
| 1 | 1 | 1 |
| 1 | 0 | 0 |
| 0 | 1 | 1 |
| 0 | 0 | 0 |

Can the boolean function f be represented with a perceptron?

☒ True

☐ False

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You have used 1 of 1 attempt

Q7

10.0/10.0 points (graded)

Consider the toy example in slide 8, decision trees handout. Suppose there is one additional feature "application_number". Suppose all the examples in this dataset have different values {v1, v2, v3, ..., v14} for application_number, corresponding to the order they appear in the table.

- ☐ application_number will have the lowest gain and hence will never be picked at the root
- ☒ application_number will be picked at the root as a first choice to split the data because it has the highest gain
- ☒ application_number is the most discriminative feature
- ☒ application_number is a useless feature and should be discarded



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You have used 1 of 2 attempts

Q8

10.0/10.0 points (graded)

Consider the toy example in slide 8, decision trees handout. Suppose there is one additional feature "application_number". Suppose all the examples in this dataset have different values {v1, v2, v3, ..., v14} for application_number, corresponding to the order they appear in the table.

Now, we define a new feature called "even_or_odd", which takes on the value "even" for {v2, v4, v6, ..., v14}, and takes on the value "odd" for {v1, v3, v5, ..., v13}.

- ☐ even_or_odd will have the same gain as "Highest Degree"
- ☐ even_or_odd will have the same gain as "Work Experience"

☒ even_or_odd will have the same gain as "Favorite Language"

☐ even_or_odd will have the same gain as "Needs Work Visa"



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You have used 1 of 2 attempts

Q9

10.0/10.0 points (graded)

Check all that apply.

☒ The perceptron is an iterative classification method

☐ The perceptron will always converge even if the data is not linearly separable

☐ The perceptron is a generative classification method

☒ The perceptron starts with a random hyperplane then adjust its weights to separate the data

☒ The perceptron is the simplest neural network



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You have used 1 of 2 attempts

Q10

10.0/10.0 points (graded)

Logistic regression outputs a value in $[0,1]$ (within the range of 0 and 1) right after sigmoid function.

☒ True ✓


☐ False

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