Week 6 Quiz

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True/False

16.3/16.3 points (graded)

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

- False
- True ✔

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True/False

10.0/10.0 points (graded)

Logistic regression is a linear classification method.

- False
- True ✔

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Multiple choice

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

- [ ] Use any classifier as far as its accuracy is slightly worse than random
- [x] The classification output is a majority voting of all weak classifiers outputs ✔
- [x] Give large weights to hard examples to focus on those in the next steps ✔

✔

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True/False

10.0/10.0 points (graded)

A decision tree generated from unbalanced training data may be biased towards the majority class.

- ○ False
- ◉ True ✔

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Checkboxes

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)
- [x] 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.
- [x] Naive Bayes classifier is a generative method. ✔

✔

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True/False

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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Checkboxes

0.0/10.0 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.

- [x] 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 ✔
- [x] application_number is a useless feature and should be discarded ✔

✖

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Checkboxes

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"
- [x] 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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Checkboxes

10.0/10.0 points (graded)

Check all that apply.

- [x] The perceptron is an iterative classification method ✔
- [ ] The perceptron will always converge even if the data is not linearly separable
- [ ] The percetron is a generative classification method
- [x] The perceptron starts with a random hyperplane then adjust its weights to separate the data ✔
- [x] The perceptron is the simplest neural network ✔

✔

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Checkboxes

10.0/10.0 points (graded)

Check all that apply.

- [ ] Logistic regression optimizes a non-convex function
- [x] Logistic regression classification outputs a value between 0 and 1 ✔
- [ ] Logistic regression classification outputs a value that can be outside [0, 1]
- [ ] Logistic regression is a generative method