## Quiz 4

You have 30 minutes to complete this 10-question quiz. The questions, a mix of multiple choice, fill-in-the-blank, and numeric answers, are weighted equally. You can consult any course materials, the internet, or R. However, you must complete the quiz individually.

Stimulus Numeric 0.5 points For Questions 1-3, consider this How many terminal nodes does the regression tree: regression tree have? 5.9 5 100% 5.1 41% 59% CHits < 182 4.8 22% Numeric 0.5 points Walks >= 15 19% What is the interaction depth of the **CRBI < 73** regression tree? 4 4.6 5.1 5.6 4% 15%

The training observations with CAtBat < 1458 comprise

41

%

of the training data and have mean response

5.1

Numeric 0.5 points

Suppose we chose the decision tree with the minimum CV error (instead of using the one-standard-error rule as usual) based on the CP table below. How many terminal nodes would this decision tree contain?

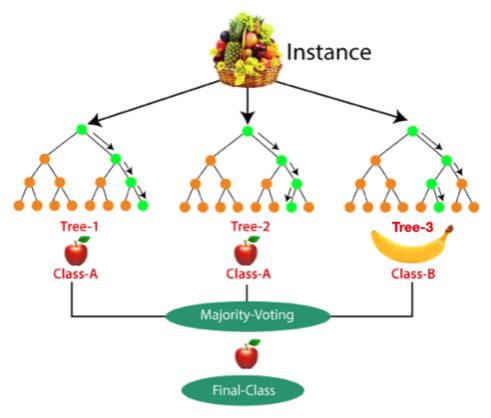
CP	nsplit	rel	error	xerror	xstd
0.567669	0	1	.00000	1.00411	0.072613
0.063293	1	0	.43233	0.47843	0.062225
0.060590	2	0	.36904	0.45832	0.066787
0.033764	3	0	.30845	0.36500	0.063361
0.029146	4	0	.27468	0.38646	0.071271
0.015175	5	0	. 24554	0.37791	0.072805
0.011737	6	0	.23036	0.35152	0.068380
0.010248	7	0	.21863	0.35856	0.068482
0.010000	8	0	.20838	0.36327	0.068681

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The trees for different bootstrap samples are grown independently of one another.

prediction.

Below is a depiction of a prediction being made by a random forest with B=3. During the training of this random forest, how many times was a subset of features sampled in order to determine a feature to split on?



21

Multiple Choice 0.5 points

Partial dependence plots are less meaningful for random forests than for boosting because

- For random forests, we typically use more trees.
- For random forests, we typically grow trees deeper.
- O For random forests, we typically use fewer features to determine each split.
- O For random forests, we bootstrap our observations.

Below is the set of observations in each bootstrap sample for a random forest with B=5. How many trees' predictions will be averaged together to obtain the OOB prediction for observation 4?

Bootstrap sample 1	Bootstrap sample 2	Bootstrap sample 3	Bootstrap sample 4	Bootstrap sample 5
Observation 2	Observation 4	Observation 4	Observation 5	Observation 6
Observation 5	Observation 2	Observation 3	Observation 6	Observation 5
Observation 5	Observation 1	Observation 1	Observation 6	Observation 4
Observation 1	Observation 5	Observation 6	Observation 1	Observation 2
Observation 5	Observation 2	Observation 5	Observation 3	Observation 1
Observation 3	Observation 6	Observation 2	Observation 3	Observation 2

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