Session-14 (Boosting) John

11/22 EU ML 14
Training Clarusway
Pear Deck - September 1, 2022 at 7:48PM

Part 1 - Summary

Use this space to summarize your thoughts on the lesson

Part 2 - Responses

Slide 1

Use this space to take notes:

Slide 2

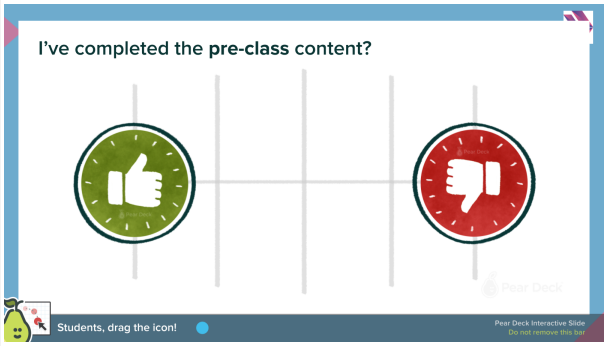
SUMMARY of PREVIOUS CLASS

- Ensemble Models
- Ensemble Method: Bagging (Bootstrap Aggregating)
- Random Forest

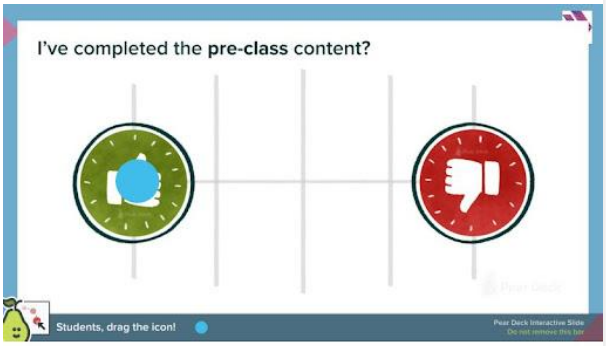
2

Use this space to take notes:

Slide 3



Your Response



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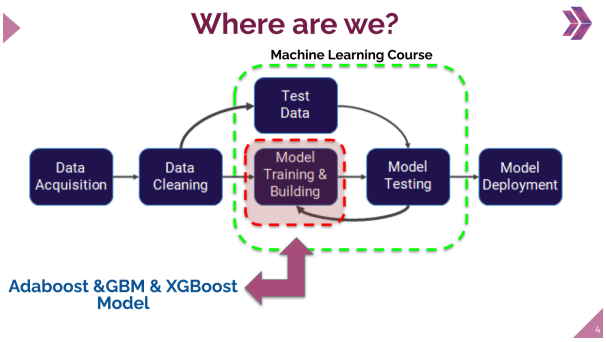

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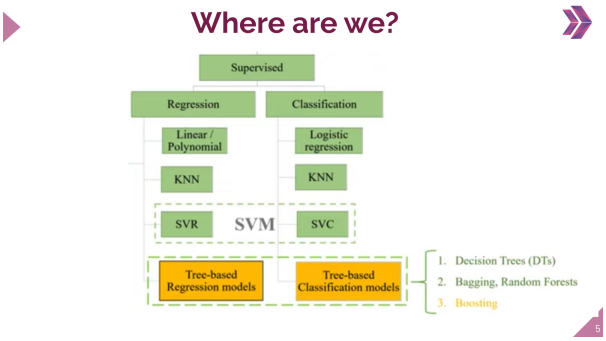

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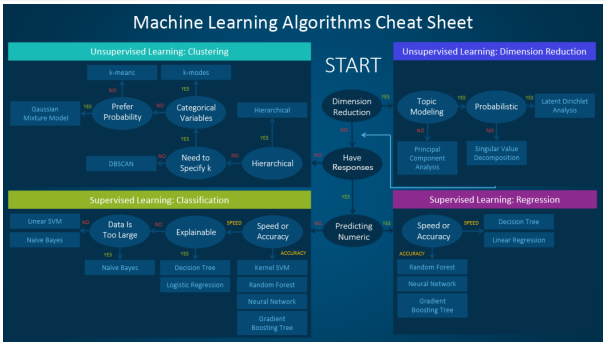

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Slide 8

Ensemble Methods: Bagging & Boosting

	Bagging	Boosting
Similarities	• Uses voting • Combines models of the same type	
Differences	Individual models are built separately	Each new model is influenced by the performance of those built previously
	Equal weight is given to all models	Weights a model's contribution by its performance

Random Forest | AdaBoost, GBM, XGBoost

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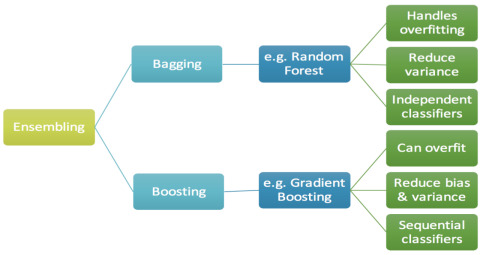
Slide 9

Boosting Algorithms



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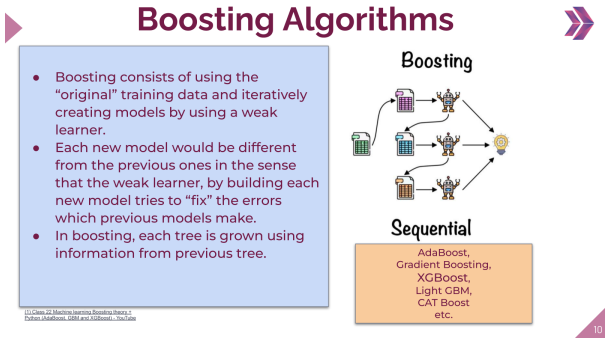
Slide 10



Link(s) on this slide:

- https://www.youtube.com/watch?v=wGdtA09Aq_0&t=740s
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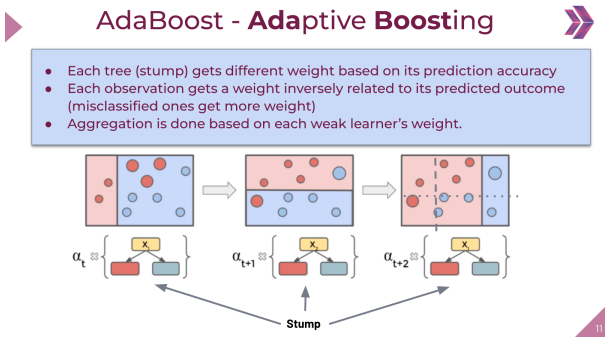

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Slide 12

Boosting Algorithms

AdaBoost Algorithm Hyperparameters:

"base_estimator" *parameter:* (default=None)

The base estimator from which the boosted ensemble is built.

If None, then the base estimator is DecisionTreeClassifier initialized with max_depth=1 (aka stump).

"n_estimators" *parameter:* (default=50)

The maximum number of estimators at which boosting is terminated. In case of perfect fit, the learning procedure is stopped early.

12

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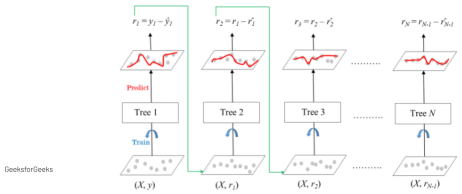
Slide 13

Gradient Boosting Machine (GBM)

- In gradient boosting, each weak learner corrects its predecessor's error.
- Each predictor is trained using the residual errors of predecessor as labels.
- Each tree can be larger than a stump.



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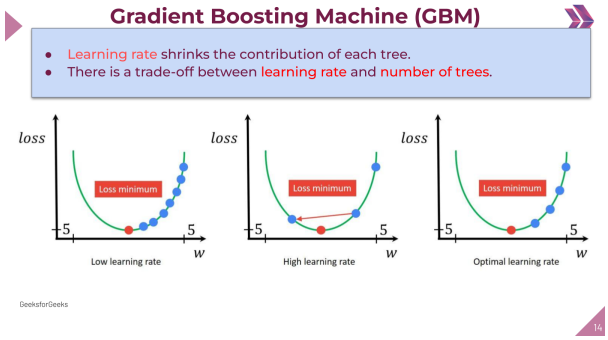
Slide 14



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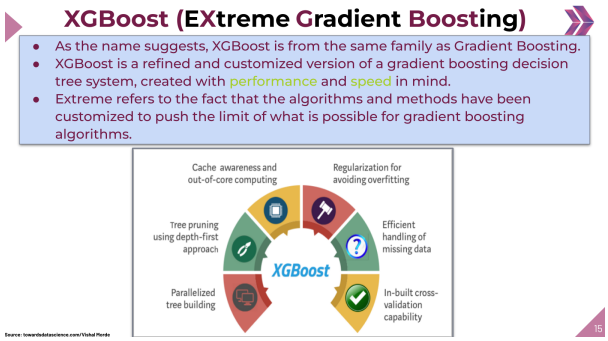

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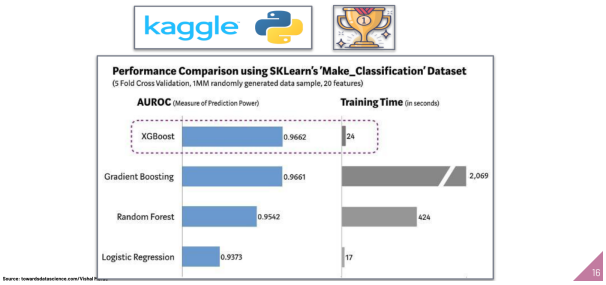
XGBoost (EXtreme Gradient Boosting)



16

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Slide 17

XGBoost Algorithm

XGBoost Algorithm Hyperparameters :

"n_estimators" *parameter:* (default=100)

The number of boosting stages to perform.

"subsample" *parameter:* (default=1.0)

The fraction of samples to be used for fitting the individual base learners. Choosing subsample < 1.0 leads to a reduction of variance and an increase in bias.

17

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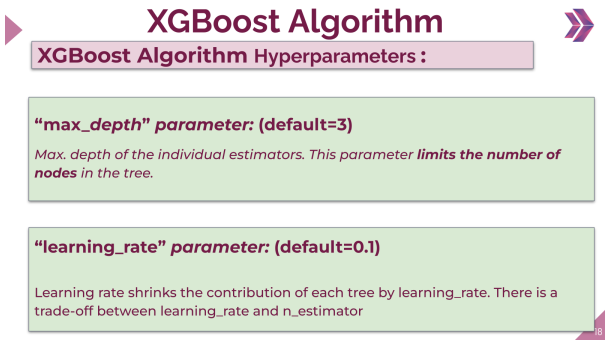
Slide 18



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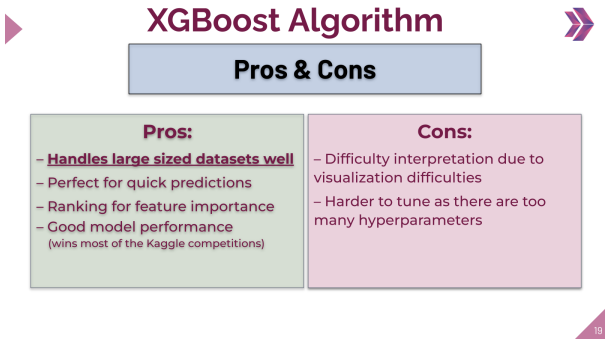

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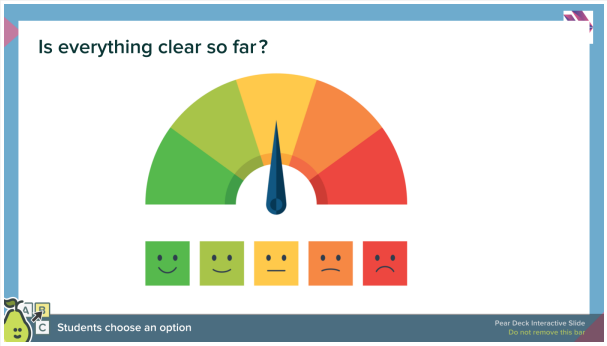
Slide 20	Your Response
	You Chose • **clear**

Slide 20	Your Response
	Other Choices • so so • confused

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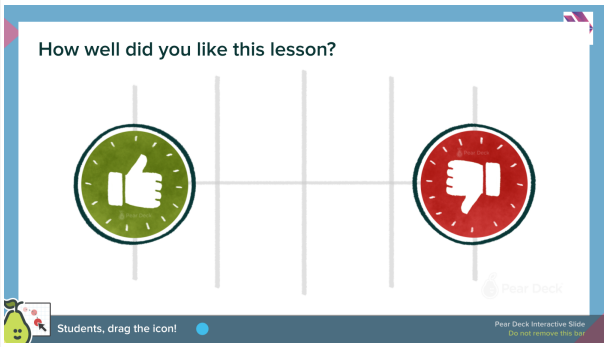
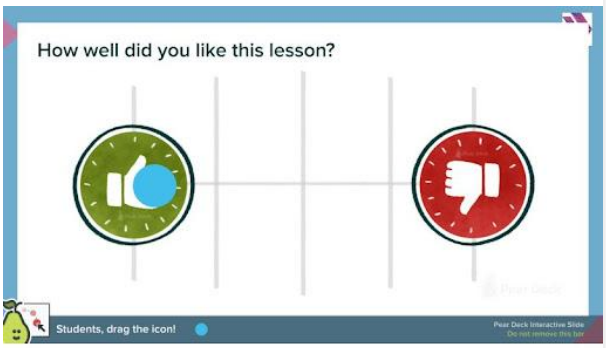
Slide 21	Your Response
	

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