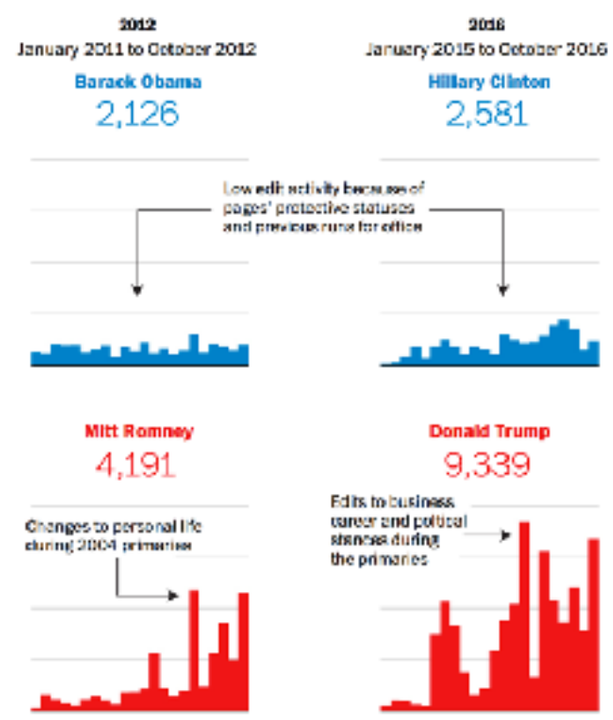
HUDK 4050:CORE METHODS IN EDM

11/7/16 9:30 AM

In the news

The Washington Post



FEDERAL POLICY

The Next President Must Make Data Work for Students: Recommendations for the New Administration

Posted on October 31, 2016

The Atlantic

The Colleges Are Watching

Technology Will Replace Many Doctors, Lawyers, and Other Professionals

Harvard Business Review

HARUKAEDU

Google-accelerated Indonesian edtech startup raises $2.2m

Learn to code startup pi-top pulls in $4.3M to fund a global edtech push

TC

StarTribune

Minn. Education Department releases student survey data

Minnesota student survey highlights a decline in student smoking and tanning bed use.

Massachusetts Builds Diverse Edtech Sector, Still Seeks Big Wins

Xconomy

Epson's New Projector App for Chromebooks Adds More Interactivity to Classrooms

EdTech Focus On K-12

Ready for School

Recommendations for the Ed Tech Industry to Protect the Privacy of Student Data

November 2016

FORGET BIG DATA—LITTLE DATA IS MAKING LEARNING PERSONAL

WIRED

2016 IEEE International Conference on Big Data (IEEE BigData 2016)

Dec. 5-8, 2016 @ Washington D.C., USA

Internships

Prediction

Machine Learning

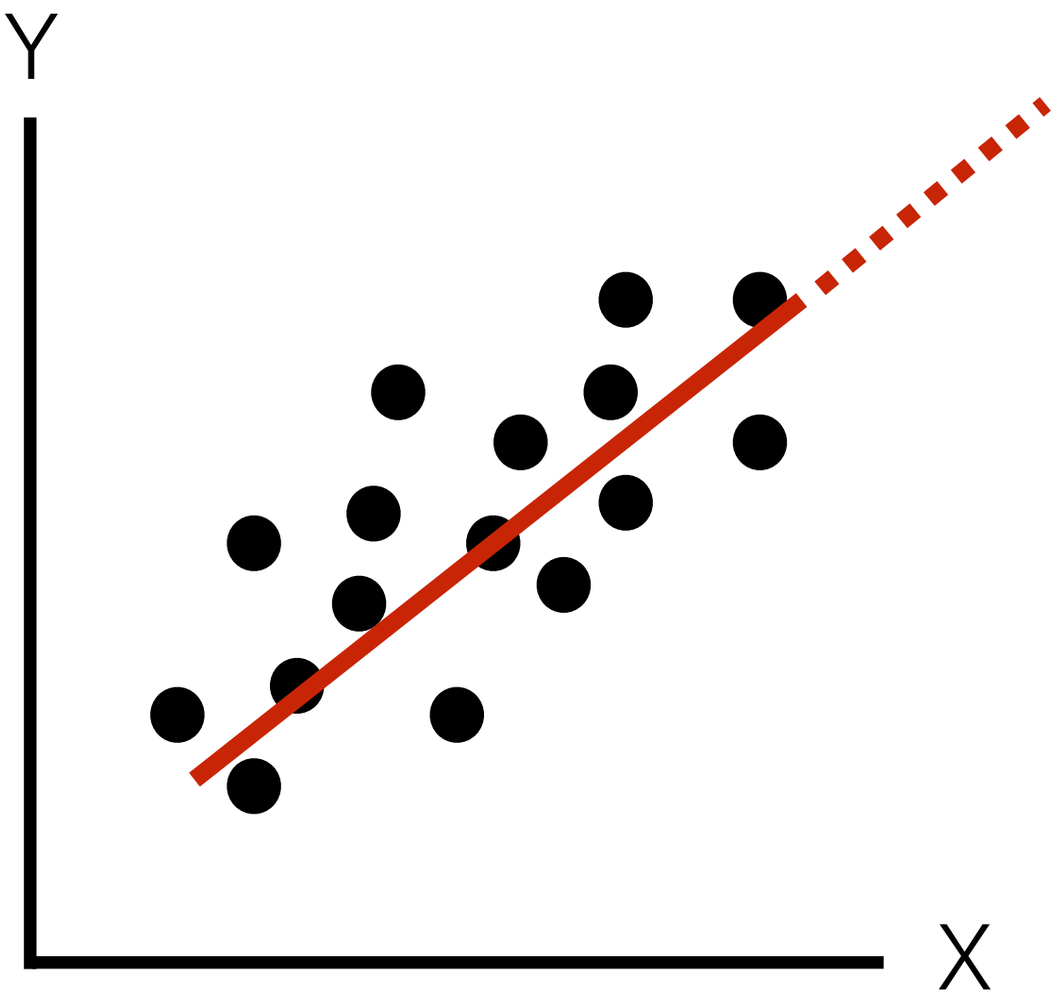
- Samuel built a computer program that could play checkers
- Recognized when it made a mistake and avoided that mistake again ("learning" through prediction)
- Built a tree of all possible moves for a given board
- Maximized a function that described the probability of winning
- Within three weeks it beat Samuel
- In 1956 it beat the world checkers champion

Arthur Samuel, 1952

Prediction

- Cuts to the ❤️ of the difference between machine learning and ed statistics

- Characterize data vs. predict the future



Terminology

Supervised Learning: Techniques used to learn the relationship between independent attributes and a designated dependent attribute (the label). (Have labelled data available that the machine can learn from)

For example: Have images labelled as dog, cat, etc, machine must learn the labels

Unsupervised Learning: Learning techniques that group instances without a pre-specified dependent attribute.

For example: Clustering algorithms

Terminology

Classification: Mapping an unlabeled instance to a discrete class by a classifier

Example: Identify a student as likely to drop out or not based on demographic data

Regression (*as a form of classification*): Mapping from an unlabeled instance to a value within a continuous range

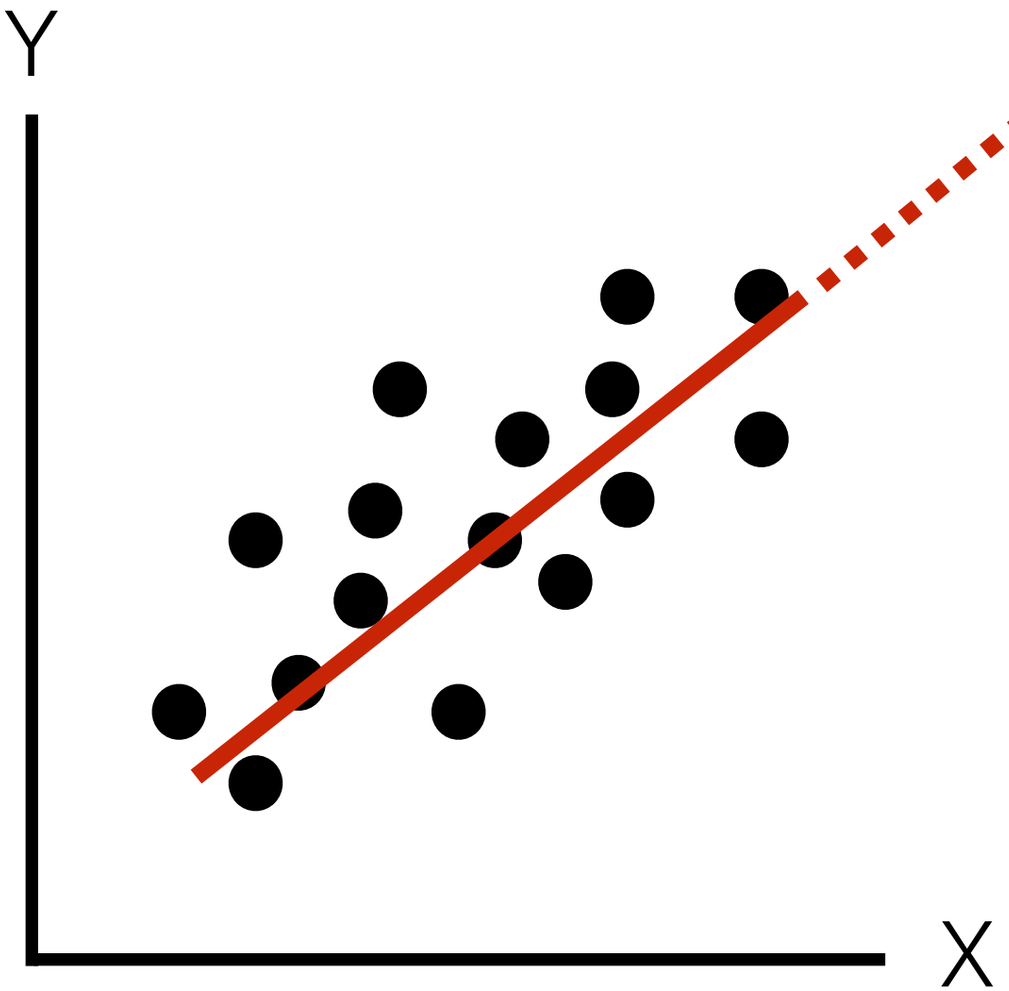
Example: Identify a student as having a math test score of 70 based on online assignment performance

Training Sets: Either supplied by a previous stage of the knowledge discovery process or from some external source

Regression

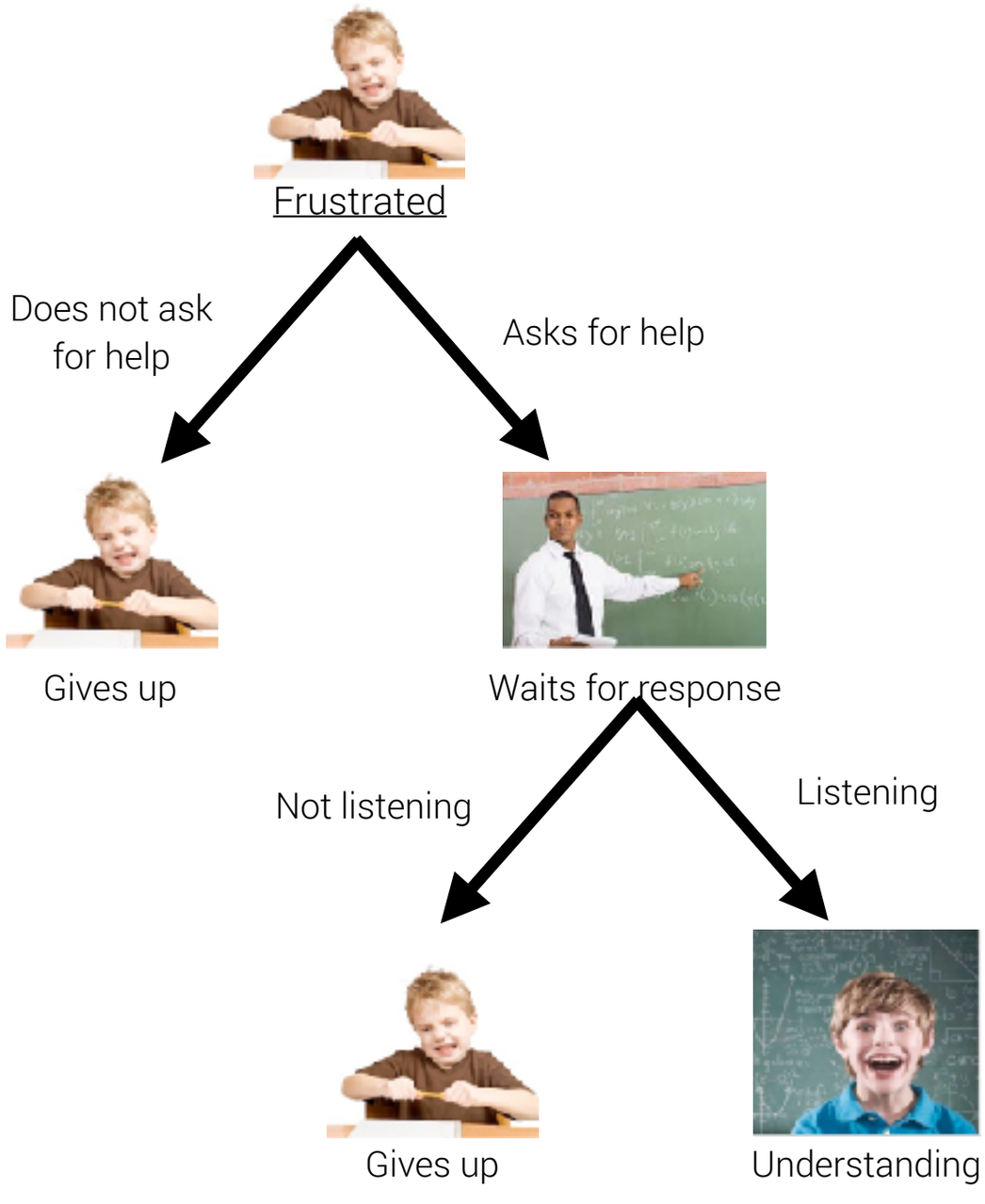
- <u>In Ed Stat</u> = OLS Regression/Logistic Regression (characterize)

- <u>In ML</u> = Mapping from unlabeled instances to a value within a continuous range (future)



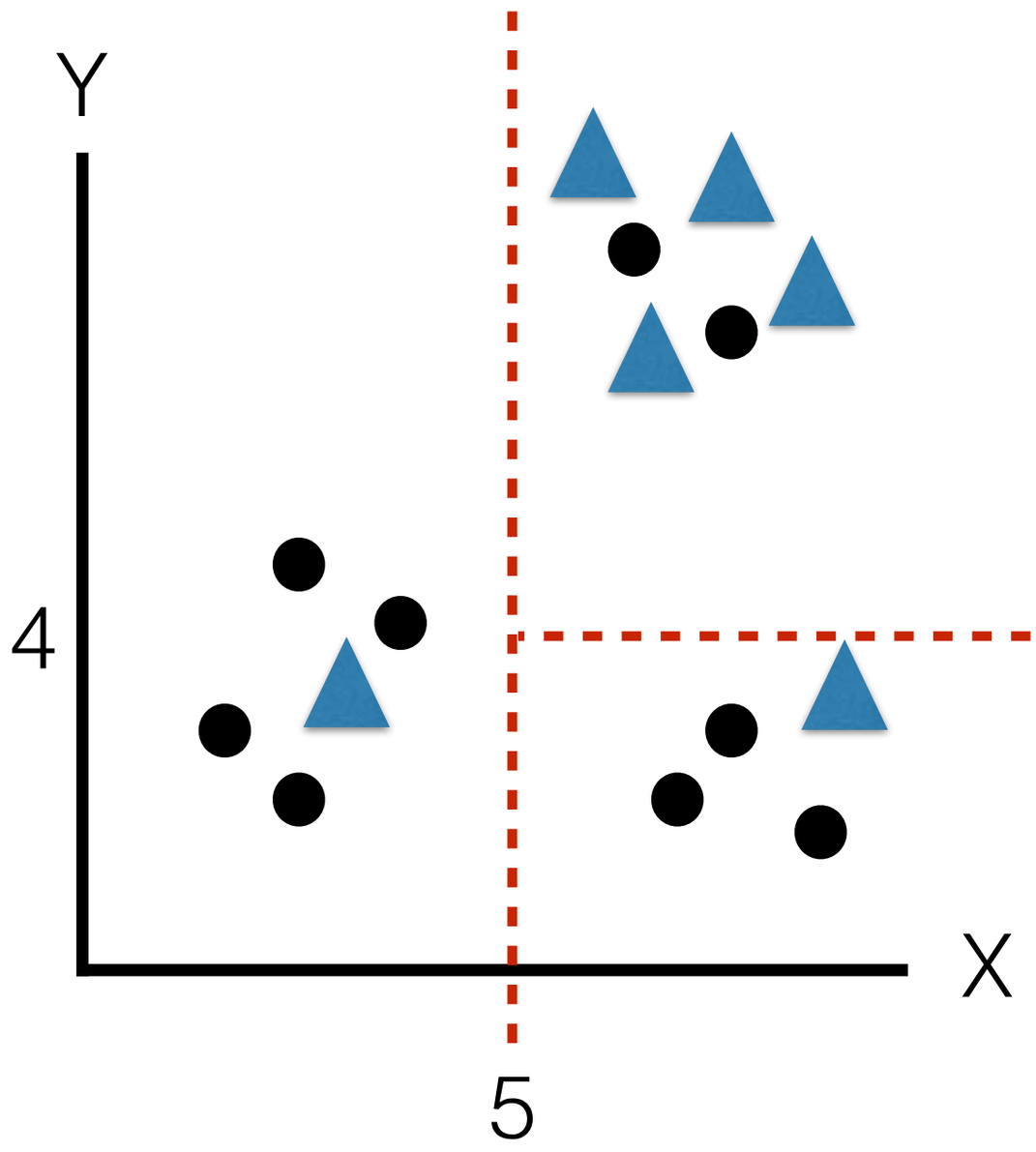
Classification Tree

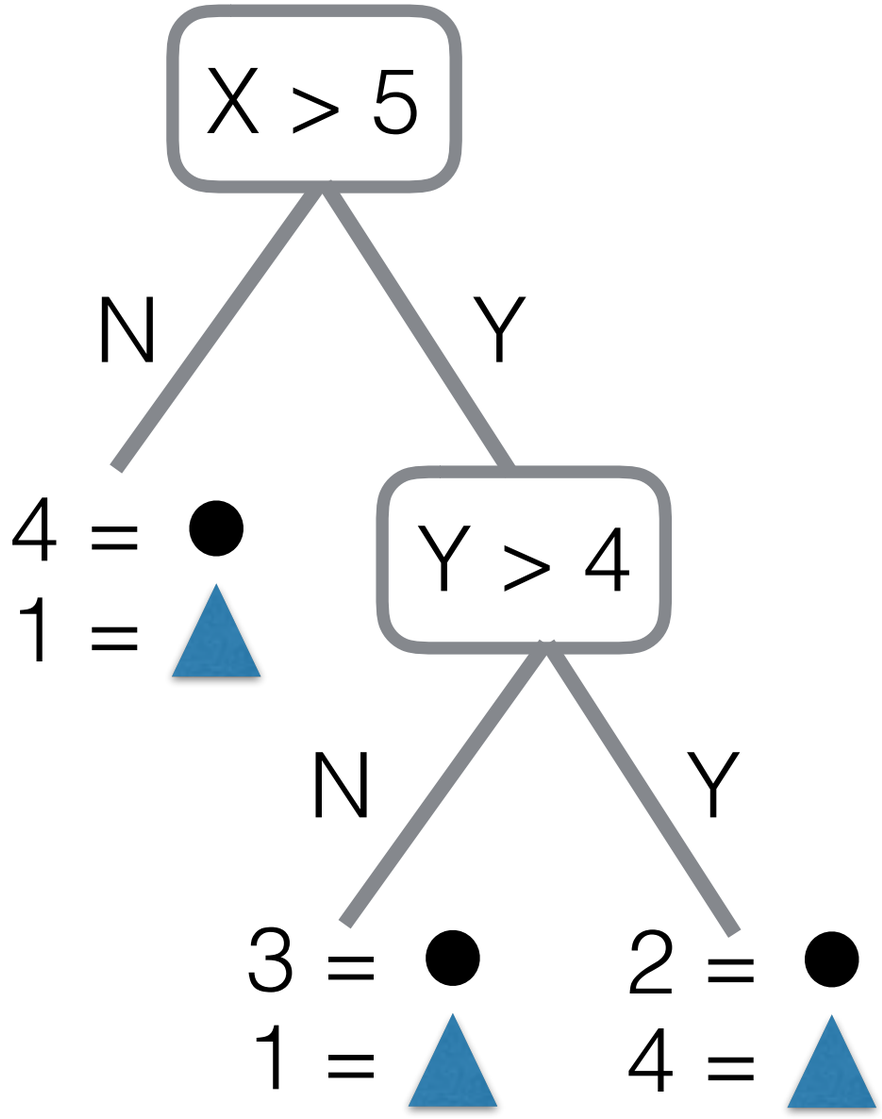
- Decision tree
- Map observations (branches) onto classes (leaves)
- Tree describes the data but can be used classification
- EG: student states = leaves, student actions = branches



Binary Classification Tree

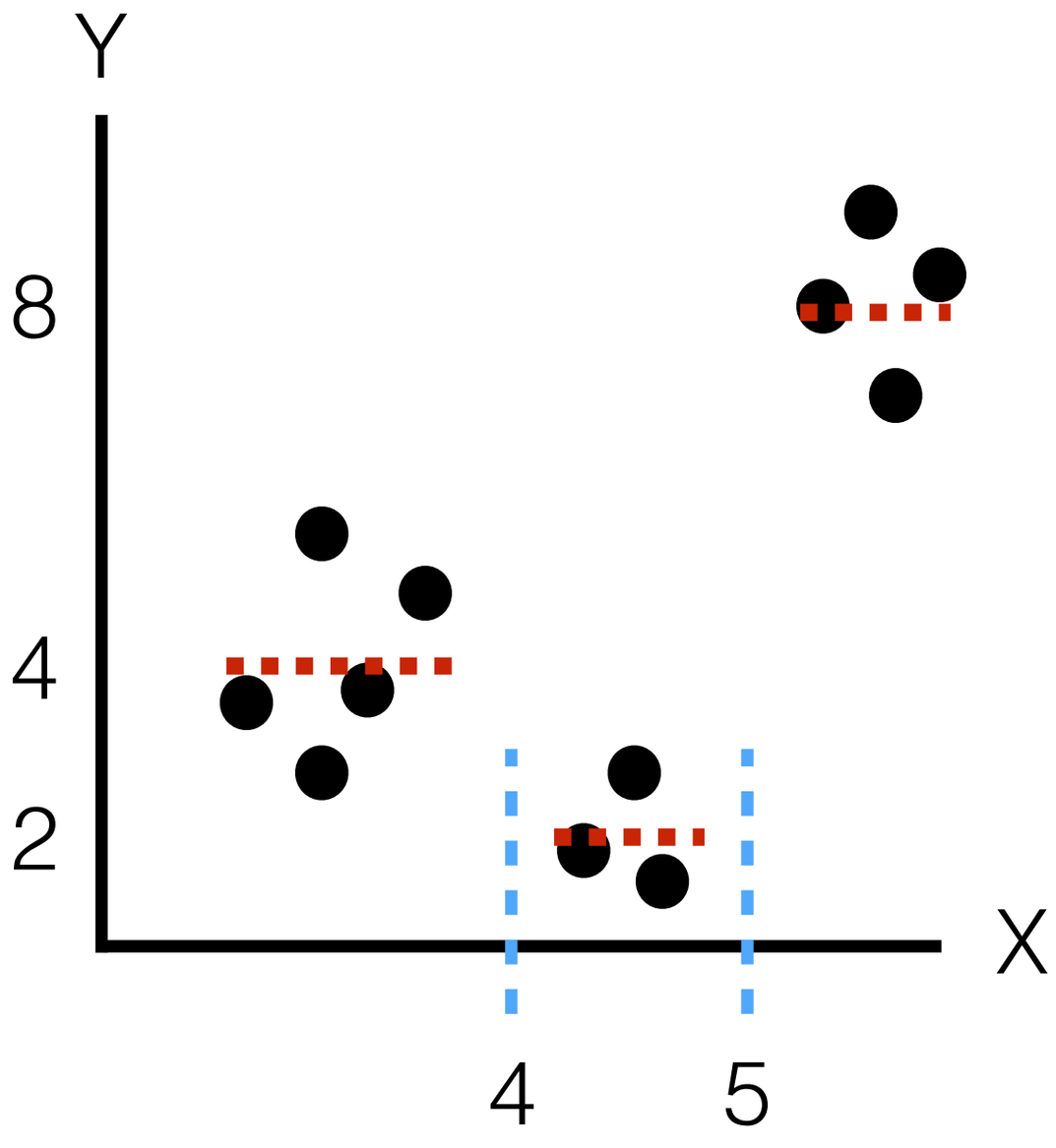
* Minimize the error

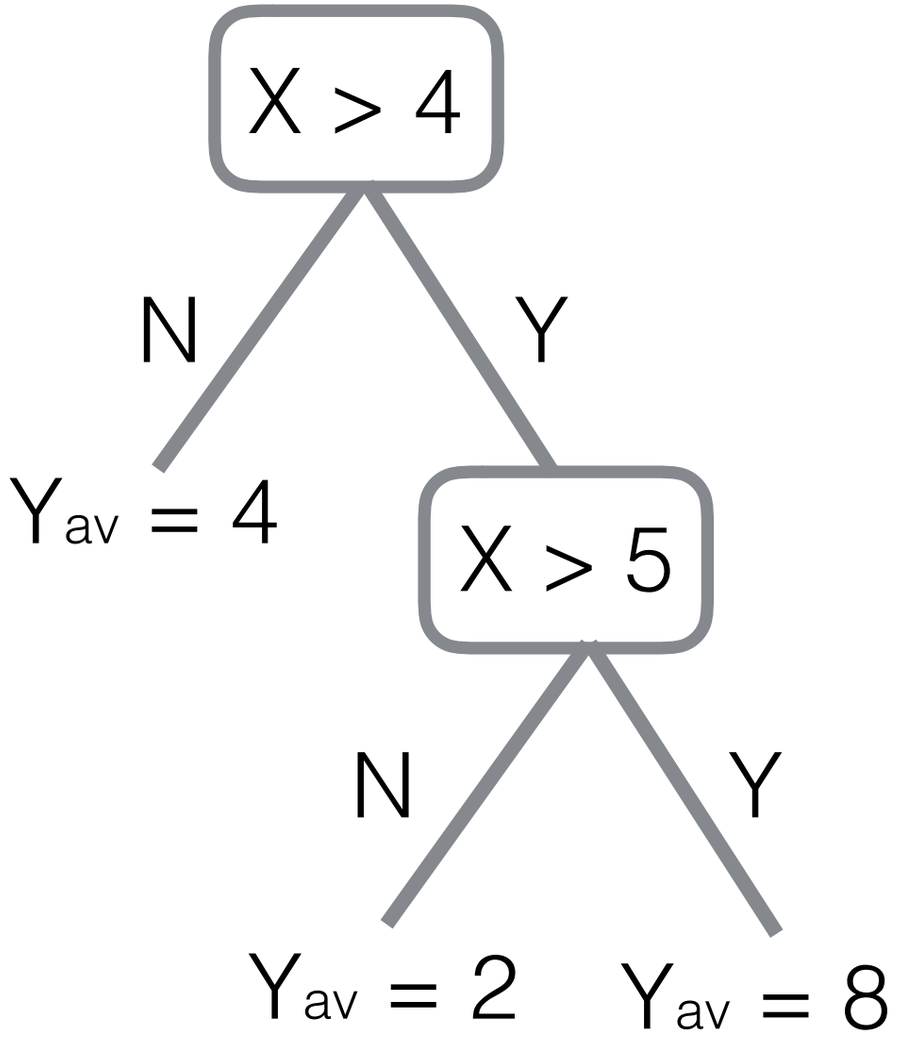




Binary Regression Tree

* Minimize the error





What are we gonna do with that Twitter?

Group 5 Plan

- Charles Tweet about upcoming course content and some potential applications or modifications that are open for adoption

- Students will discuss and advocate for their interests during the week

- Charles will create a poll with options that consider or reflect the twitter discussions