sit at a seat with paper and write your name!

EECS 245 Fall 2025
Math for ML

Lecture 1: Introduction

→ Read chapters 1.1-1.2

→ Course website: eecs245.org

Agenda

1. Who am I?
2. What is machine learning, and what will we learn in this class?
3. Logistics
4. Models and loss functions

Who am I?

→ call me Suraj "soo-rudge"

→ 2nd year as Teaching Faculty @ Michigan

→ Taught data science @ UCSD from 2021-2024

→ BS and MS @ UC Berkeley

→ TA info : eecs245.org/staff

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Miami


Chicago


Ireland


London


Grand Rapids


San Francisco


Sleeping Bear
Dunes


NYC


Toronto

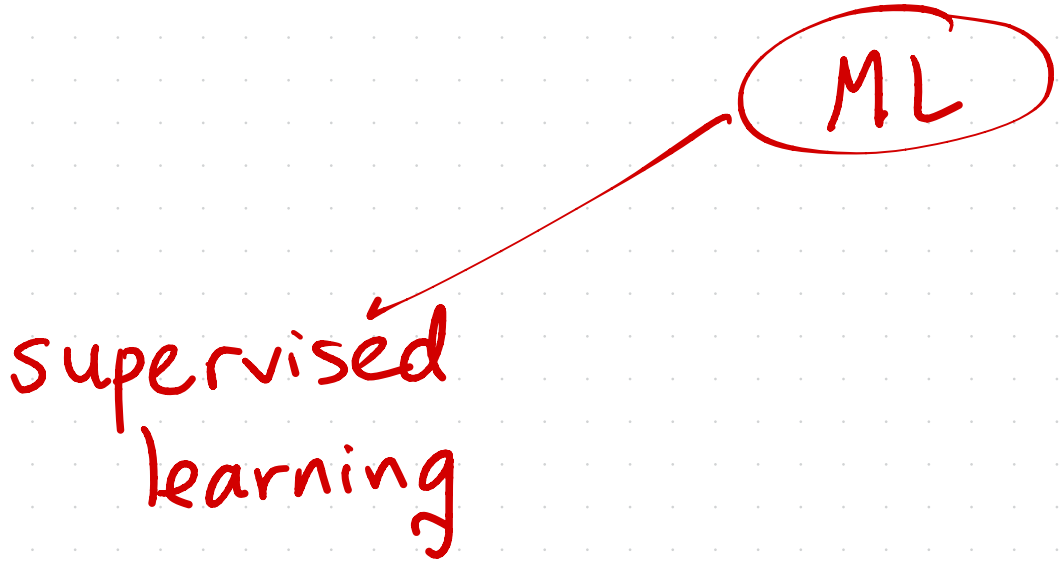
If you could do anything,

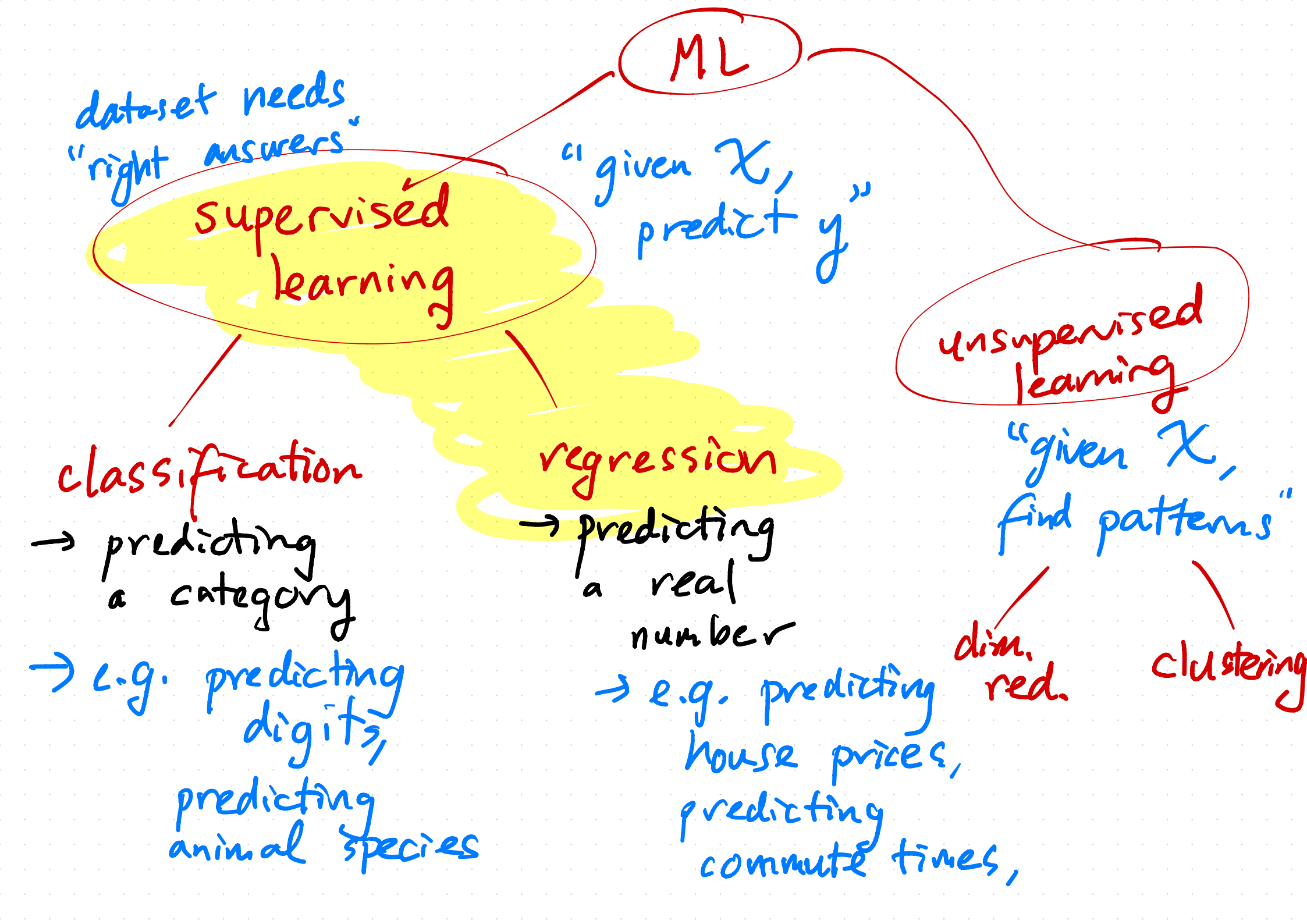
what would you do?

My answer: 50% travel agent/advisor/blogger

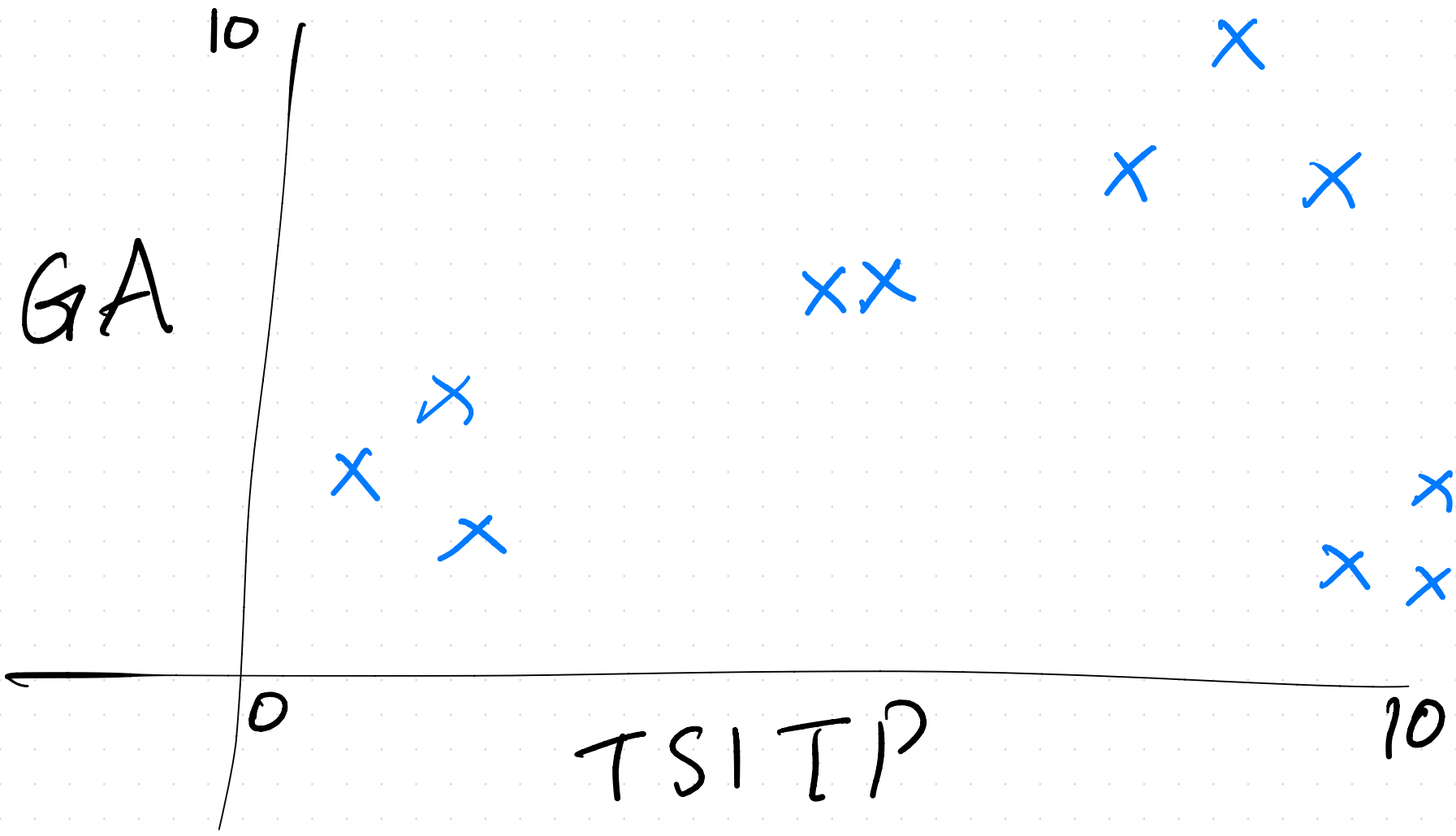
50% university instructor

ML: automatically learning patterns from data

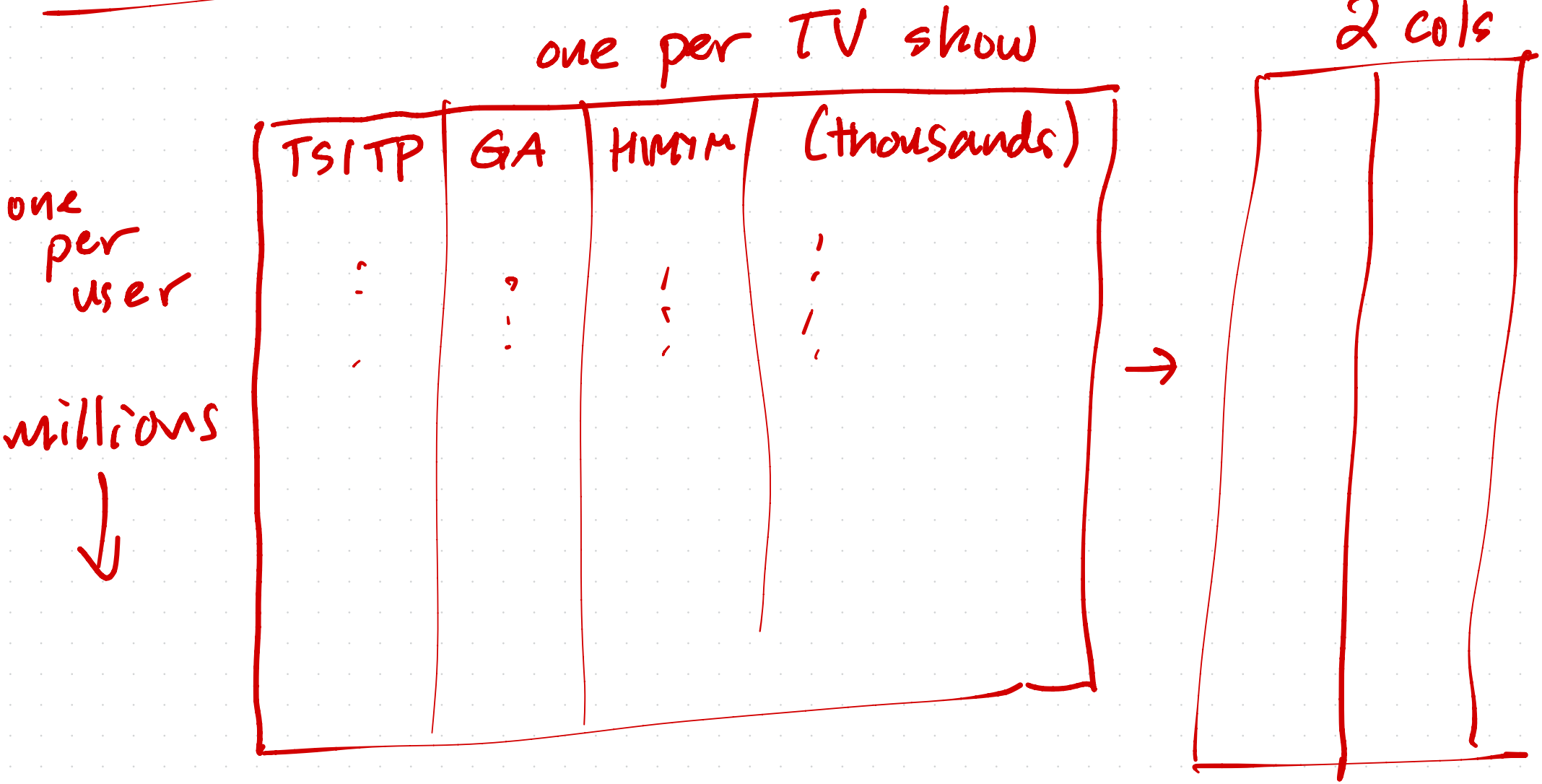



ML
dataset needs "right answers"
supervised learning
"given X, predict y"
unsupervised learning
"given X, find patterns"
classification
→ predicting a category
→ e.g. predicting digits, predicting animal species
regression
→ predicting a real number
→ e.g. predicting house prices, predicting commute times,
dim. red.
clustering

e.g. clustering



e.g. dimensionality reduction



EECS 245
"Mathematics for Machine Learning"

6 "chapters"

1) Introduction to Supervised Learning
   some calculus, multivariable calculus, summation notation
2) "Core" linear algebra
3) Linear algebra + ML
4) Multivariable calculus + linear algebra
5) "Hard" linear algebra
6) Probability (+ linear algebra)

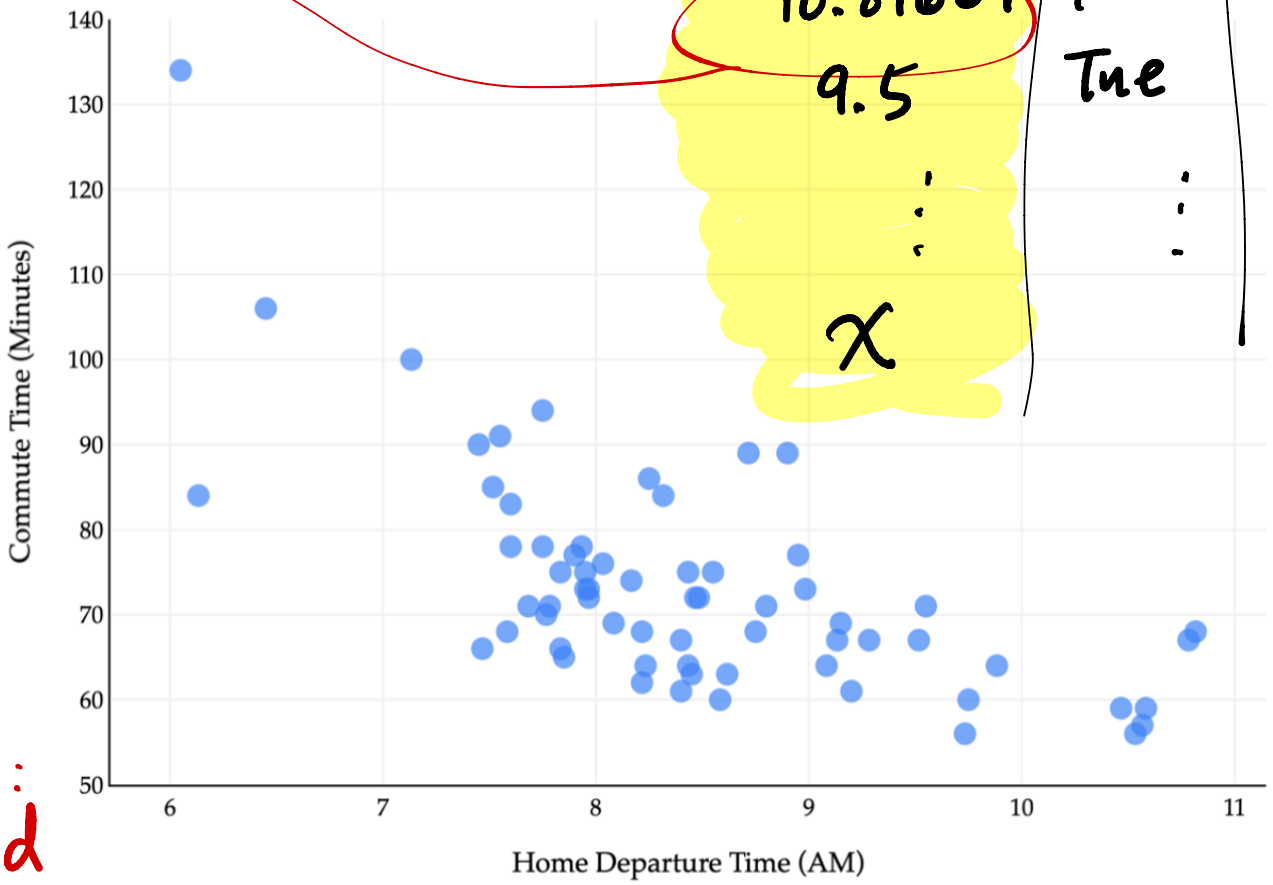
Logistics

eecs245.org

no Canvas!

- ✓ Lectures and notes
- ✓ Labs
- ✓ Homeworks
- ✓ Exams

10 hours + 0.816667 × 60 minutes
= 10:49 AM



departure hour	day	fuel	commute time
10.81667	Mon	5G	68
9.5	Tue	2G	75
⋮	⋮	⋮	⋮
x			y

↑ labels

Given x, predict y: supervised regression

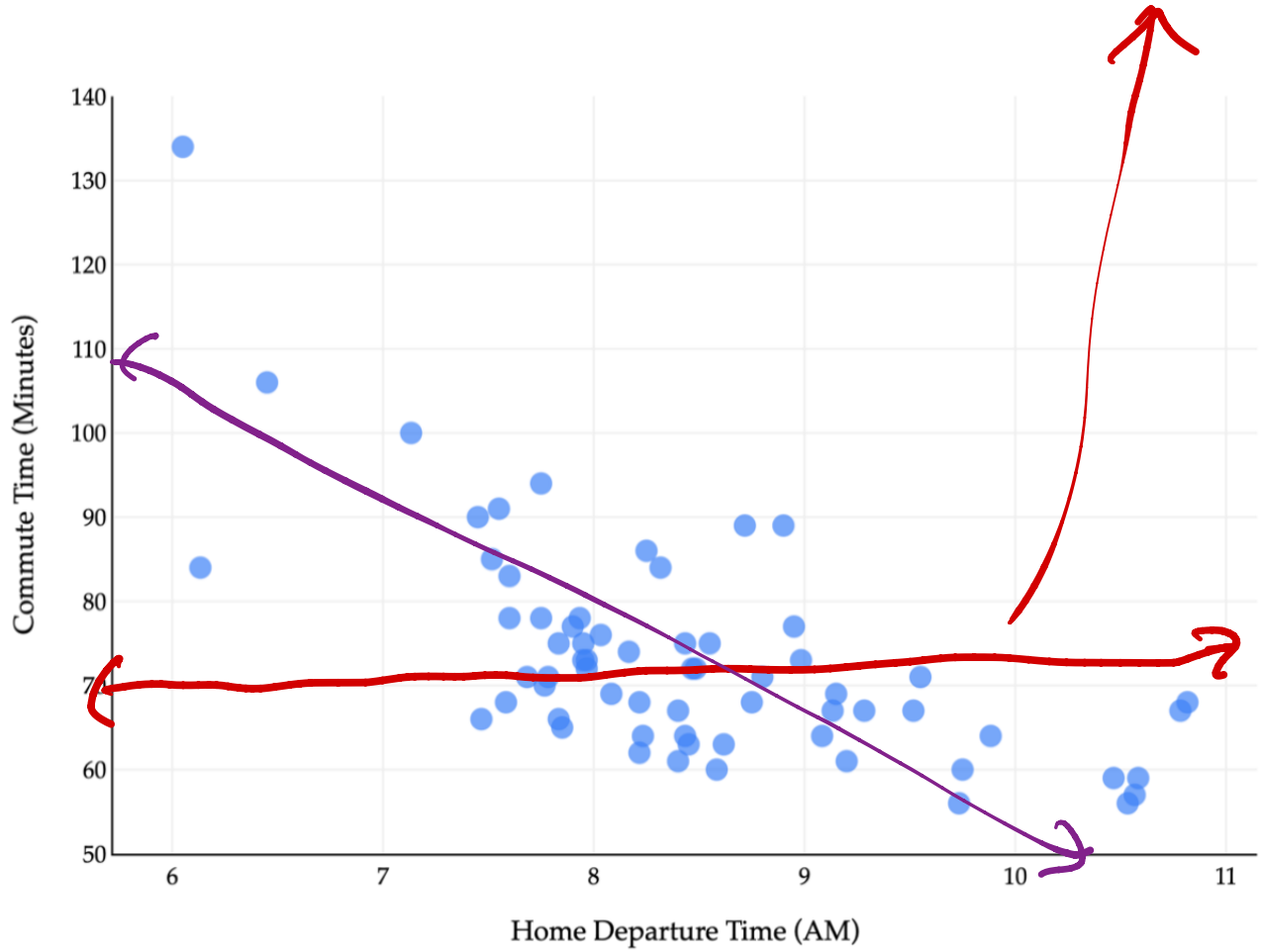
Need to assume future ≈ past

Model : A set of assumptions about how data were generated

① Constant model

② Simple linear regression model

Question: Among all possible constant models, which is the best?



office hours: 4721 BBB

right now