Introduction to Data Science
COMP 5360 / Math 4100

Bei Wang Phillips
beiwang@cs.utah.edu

Anna Little
little@math.utah.edu

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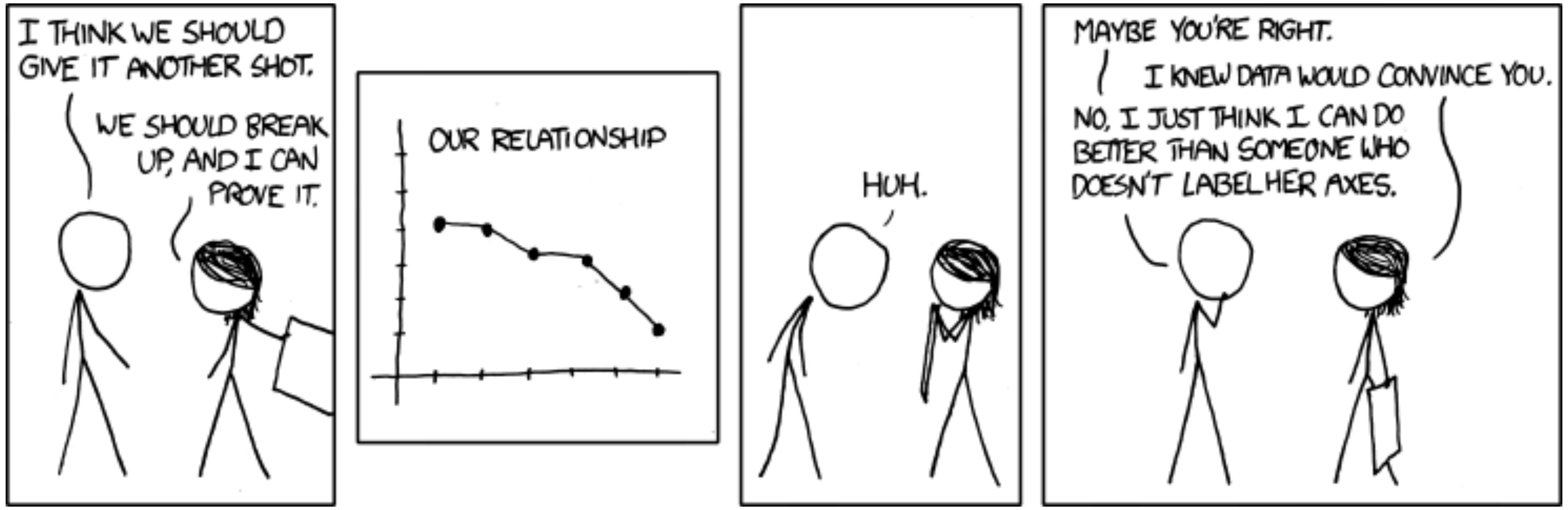

I THINK WE SHOULD GIVE IT ANOTHER SHOT.
WE SHOULD BREAK UP, AND I CAN PROVE IT.
OUR RELATIONSHIP
HUH.
MAYBE YOU'RE RIGHT.
I KNEW DATA WOULD CONVINCE YOU.
NO, I JUST THINK I CAN DO BETTER THAN SOMEONE WHO DOESN'T LABEL HER AXES.

[xkcd]

Project

It’s time to start thinking about your project.

What you need:

A team of 2-3

An idea

A dataset (that you actually can get!)

http://datasciencecourse.net/2022/resources/

Project Phases

1. Announce your team and title (Friday, March 11)
2. Submit your project proposal (Friday, **March 18**)
3. Get/give peer feedback (**mandatory** in class on March 29)
4. Get written feedback from staff (by March 29)
5. Submit project milestone (Tuesday, **April 5**)
6. Get staff feedback (individual appointments, April 6-12)
7. Submit final project (Friday**, April 22**)
8. Project Awards (in class on April 26)

Note: Late policy does not apply; project items must be on time.

Project Requirements

- Scope as agreed upon with Staff
- Should contain:
  - Data acquisition (scraping, API). Consider multiple datasets.
  - Data cleanup
  - Exploratory Visualization
  - Two different analysis methods (classification, regression, clustering, dimensionality reduction, NLP)
    - Evaluate alternative approaches for each one (e.g., compare two or more classification methods)
  - Ethical considerations
- You can skip one of these (except ethics), but you have to make up in other areas
  - E.g., if you work with clean & existing dataset, the analysis has to be more sophisticated
- Be ambitious! Define your goals and categorize them:
  - must have, nice to have, etc.

Ethical Considerations

Where in the process of your analysis were ethical decisions made? What were they?

Stakeholder analysis

- Who are the different “personas” relevant to your project?
- What are some incentives that may align or compete among these groups?

Is the data you collected biased or unbiased?

Are there certain groups that would be disproportionally affected by analysis or by the data?

Dont’s

Don’t use a standard machine learning dataset (Kaggle, UCI ML Repository)

- These are pre-processed and only suitable for analysis, not for the whole DS process

Don’t pick a dataset where structured data is hard to extract

- E.g., text-only, relying on advanced NLP,
- extracting data from collection of PDFs,
- running your own survey (it’s hard to run a good survey)

Proposal Sections

Basic Info.

Background and Motivation

Project Objectives

Provide the primary questions you are trying to answer in your project.

Data

Ethical Considerations

Data Processing

Exploratory Analysis

Analysis Methodology

Project Schedule

Submit as PDF or Jupyter notebook to Canvas; **one per Group**

Milestone

Acquired, cleaned data

EDA

Sketches of your analysis methods

Submit zip file with Jupyter Notebook, data, other resources. **One per Group.**

Final Submission

Whole story in a notebook

Include interpretation!

Three minute video that narrates project

Group Work

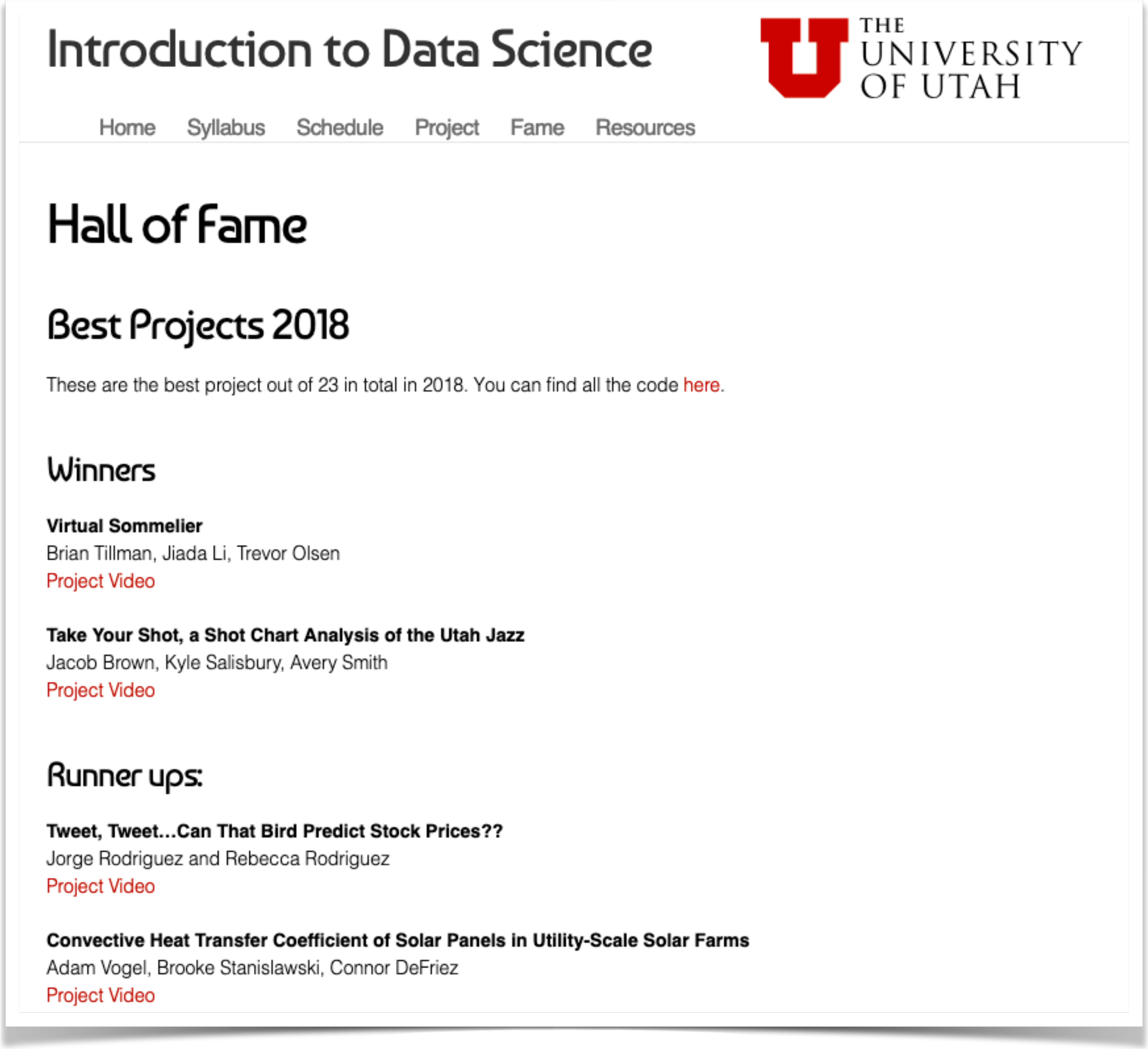
Be fair to your team-members

Stay within the schedule you agreed upon

Communicate immediately if there is a problem

Reach out to course staff if problem serious; do so before it’s too late.

Example Projects: Hall of Fame



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Hall of Fame

Best Projects 2018

These are the best project out of 23 in total in 2018. You can find all the code here.

Winners

Virtual Sommelier
Brian Tillman, Jiada Li, Trevor Olsen
Project Video

Take Your Shot, a Shot Chart Analysis of the Utah Jazz
Jacob Brown, Kyle Salisbury, Avery Smith
Project Video

Runner ups:

Tweet, Tweet...Can That Bird Predict Stock Prices??
Jorge Rodriguez and Rebecca Rodriguez
Project Video

Convective Heat Transfer Coefficient of Solar Panels in Utility-Scale Solar Farms
Adam Vogel, Brooke Stanislawski, Connor DeFriez
Project Video

http://datasciencecourse.net/2020/fame/