UNIVERSITY of WASHINGTON

DATA 515 A

Software Engineering for Data Scientists

Project Part 1

David Beck[1,2], Joseph Hellerstein[1,3], Jake VanderPlas[1,4]

Jay Garlapati[3]

[1]eScience Institute

[2]Chemical Engineering

[3]Computer Science Engineering

[4]Astronomy

The University of Washington

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Class project overview

- Collaborative software engineering experience
  - Teams of 3 to 4 with 4 being optimal
  - Develop project in Git w/ GitHub
    - Not Google docs or Dropbox

Class project overview

- Collaborative software engineering experience
  - Design (use cases, component specification)
  - Documentation (how to, docstrings)
  - Style (PEP8, pylint)
  - Coding, testing & milestones
  - Standup & code reviews

http://uwseds.github.io

Project Type 1:
Answer "Research" Questions

- Problem statement: Answer two to three questions of business or scientific relevance
  - Use a Jupyter notebook and supporting python files
- Example
  - Climate Police: Analyze effects of pollution on the planet.

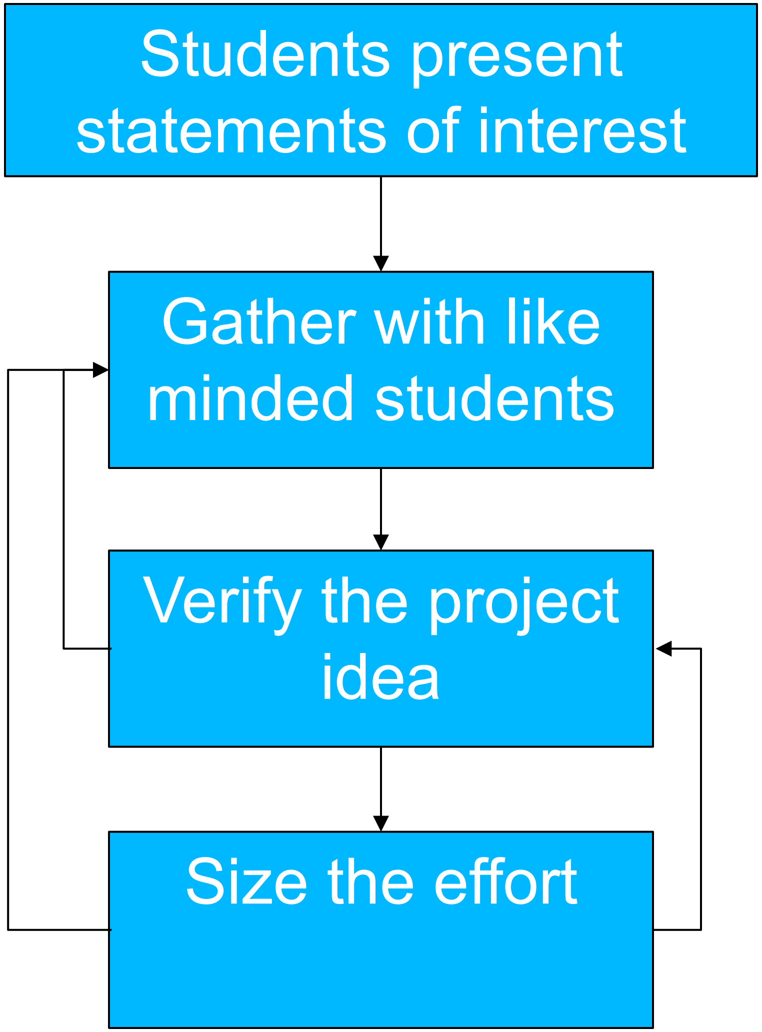
Capstone Project Type 2: *Create Reusable Data*

- Problem statement: Create data repository with tools (e.g., search, visualization, analytics)
- Example
  - Car2Know: Provide car rental data to users of Car2Go (e.g., for planning trips)

Project Type 3: *Create a Tool*

- Problem statement: Solve a problem common to many users
  - Don’t re-invent the wheel
- Example
  - BioReactor Data Logging – Monitor and publish data from BioReactor experiments

Getting Started



Students present statements of interest

Gather with like minded students

Verify the project idea

Size the effort

Beck, Hellerstein & VanderPlas, 2016

Student Summary

- Topics of interest
- Data you have access to NOW
  - How much you've used the data
  - Code you have to access the data
  - How clean the data are

Do this in 1 minute!

Verify the Project Idea

- Is there an unmet need (i.e. no code already exists)?
- Clarity about the project type?
- Consensus on the problem being solved.
- Do you have data that can solve the problem?

More on the Data

- At least two non-trivial data sets
- Data need to be combined, joined, merged, etc. to answer the scientific questions
- Have access to the data NOW!

Some Public Data

- http://drugbank.ca
- http://toxnet.nlm.nih.gov
- https://data.seattle.gov/Transportation/Traffic-Flow-Counts/7svg-ds5z
- https://www.divvybikes.com/data
- http://www.nyc.gov/html/tlc/html/about/trip_record_data.shtml
- https://www.kaggle.com
- Pronto bike data
- American Fact Finder Data
- European union data (World bank)
- Russian federation data (World bank)
- China data (World bank)

Some Third Party Tools

- What third party tools can / might you leverage?
  - Sci Kit Learn
    - http://scikit-learn.org/stable/
  - Lasagne
    - http://lasagne.readthedocs.org/en/latest/
  - Bokeh
    - http://bokeh.pydata.org/en/latest/

Grading Rubric

- Design (use cases, component specification)
- Documentation (how to, docstrings)
- Style (PEP8, pylint)
- Coding, testing & milestones
- Standup
- Project presentation

Data! Data! Data!

- At least two non-trivial data sets
- Data need to be combined, joined, merged, etc.

Think about your data NOW!