



Modeling the Progress and Efficacy of Wisconsin Computer Science Education

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Motivation

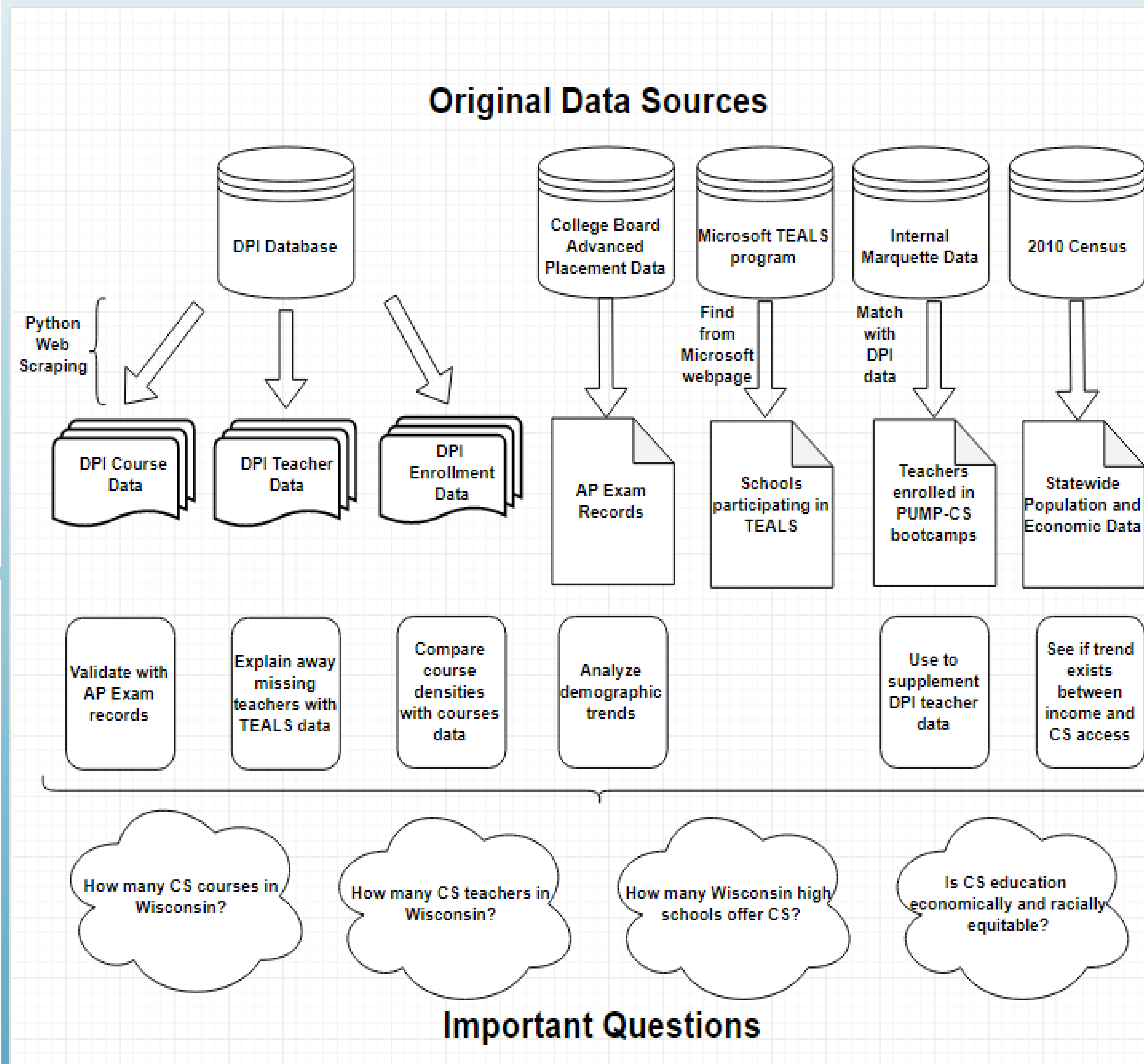
- Understanding of computer science fundamentals increasingly more relevant, but high schools do not adequately teach CS
- Lack of CS educational standards and departmental infrastructure results in messy, incomplete records

Purpose

- Identify important statistics: how many high schools teach CS, how many students take CS, and how many licensed CS teachers are there
- Analyze how CS has grown in the last few years
- Investigate equity of access to CS
- Guide unlicensed CS teachers to pathways to licensure
- Inform state and local educational policy-making

Challenges

- The vast majority of this data is noisy, incomplete, outdated, and often erroneous – reflective of poor data collection protocols
- Must compensate for this with quantity and variety of records



Results

- CS enrollment has sharply increased in recent years
- Growth especially seen in courses palatable to students with minimal CS experience
- Lagging CS licensure acquisition casts some doubt on quality
- Economic/racial equity in CS largely absent, mirrors U.S. trends

Conclusions

- Likely more funding required to stimulate growth of CS departments
- A standardization of CS courses and data collection would open up more avenues for research

Future Work

- Machine learning techniques may be able to predict CS growth trends
- Problem can be viewed as a supervised, binary classification question (does this school have CS enrollment?)
- Requires a larger annotated dataset than currently available; relies on standardization of information collection

2018-19 CS High School Course Density

Course Name	With licensed teacher at school	Without licensed teacher at school
AP Computer Science A	32	35
AP Computer Science Principles	19	23
Exploring Computer Science	12	37
Computer Programming	35	36
Mobile Applications	6	11
Computer Game Design	18	45

This material is based upon work supported by the National Science Foundation under Grant #1923597