DATA SCIENCE

Course Overview

April 18, 2024

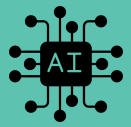
LARA GRECO AND DEREK TU - LBHS MATHEMATICS

LAGUNA BEACH
UNIFIED SCHOOL DISTRICT

PURPOSE

Exposure to an increasingly data-driven landscape.

Understanding how data is used can help create a more responsible and informed society.



Machine learning is universally relevant in all fields of study and career paths.

Statistics:

what we do now

Procedural

Students are given:

- clean, curated, and finite data sets
- the story or scenarios
- target objective

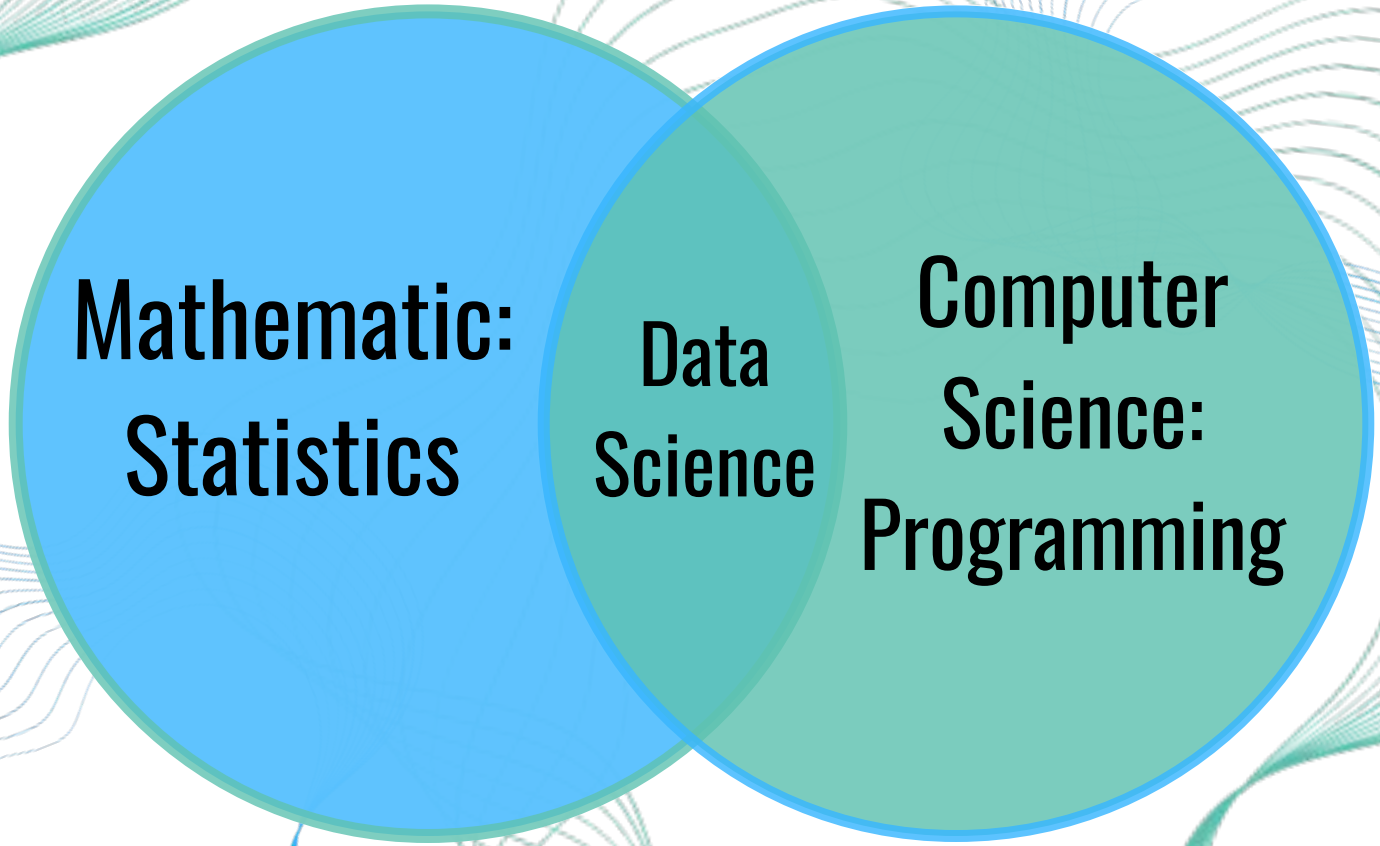
Data Science:

where we want to be

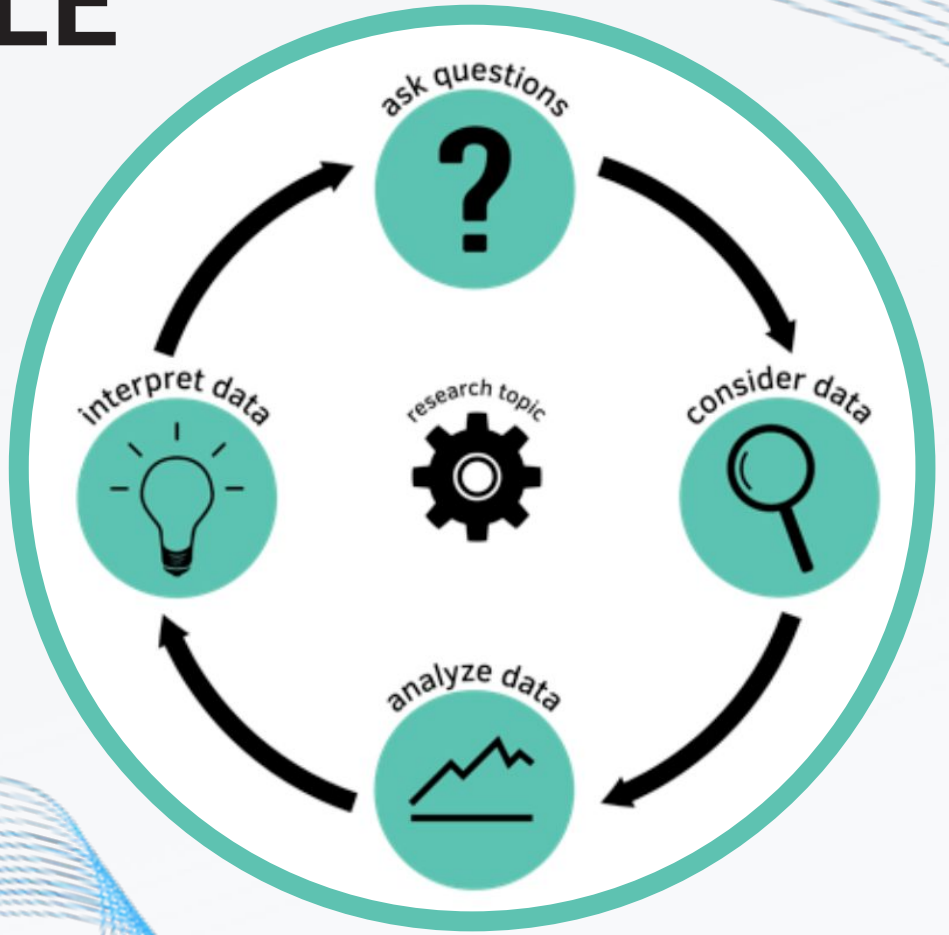
Conceptual

Students:

- given large, raw datasets
- construct a story from the data
- figure out what questions to ask


Mathematic:
Statistics
Data
Science
Computer
Science:
Programming

DATA CYCLE


ask questions
consider data
analyze data
interpret data
research topic

Theme 1

DATA AND VISUALIZATION

- Fundamentals of data analysis—such as distributions and multivariate associations
- Use technology to create and interpret visualizations of real-world processes captured by data

Theme 2

DISTRIBUTIONS, PROBABILITY, & SIMULATIONS

- Students use numerical summaries to describe distributions
- Introduce probability through the lens of computer simulations for informal inference

Theme 3

DATA COLLECTION METHODS

- Learn various ways to ethically and practically collect data
- Use Participatory Sensing (i.e. Fitbit study)
- Learn consequences of poor data collection methods

Theme 4

PREDICTIONS AND MODELS

- Create and utilize statistical models to predict future observations
- Measure the success of these predictions

UNITS OF STUDY

1. DESCRIBING & VISUALIZING CATEGORICAL/QUANTITATIVE DATA
2. USING TECHNOLOGY TO EXPLORE DATASETS
3. PROBABILITY
4. MACHINE LEARNING/PREDICTIVE MODELING
5. DATA COLLECTION METHODS
6. EXPERIMENTAL DESIGN
7. INFERENCE
8. DATA SCIENCE CAREER PATHWAYS

STUDENT FEEDBACK

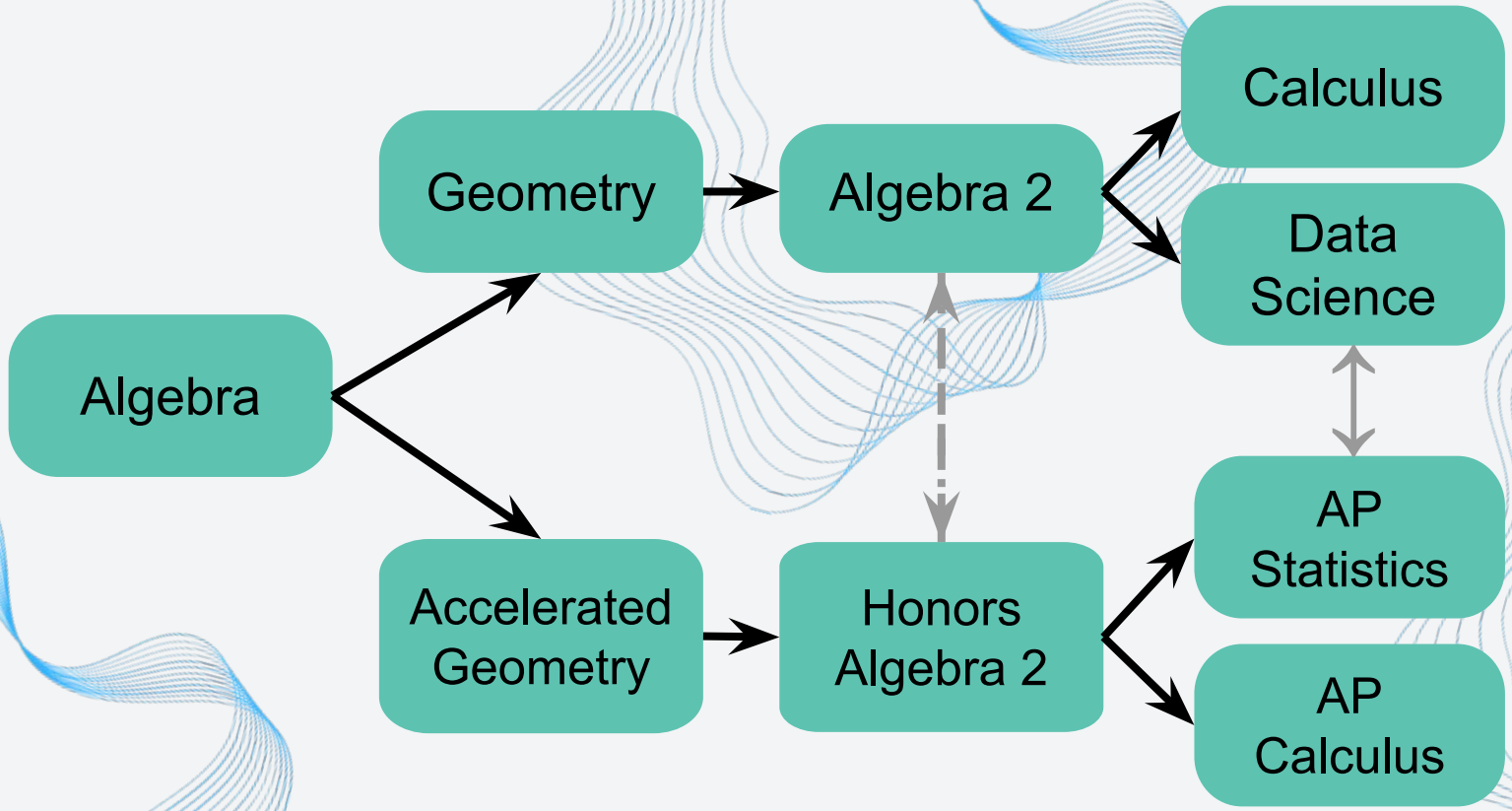
"Statistics and Data Science can help to understand real-life data that means something to us. I want to be a sports agent so this is the perfect course for me."

"I chose to take Statistics and Data Science because it is the most relevant math course offered at LBHS, especially considering this day and age."

"The data science class would be beneficial for students moving forward because analyzing data is a big part of most businesses. A course could open up new pathways for students who would not have thought about pursuing a career in data science prior."

"I enjoy our focus on data analysis instead of more hand calculation-based problems. It allows us to learn and prepare for situations we might face in real life. Being able to interpret graphs and use Google Sheets is very important and allows us to collaborate and hear peers' perspectives."

LBUSD Projected Math Pathways



Further steps

1. Curriculum Council / Board Approval
2. UC Course Approval
3. Teacher Professional Development
4. LBHS Master schedule 2024-25

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