# Student Exam Performance

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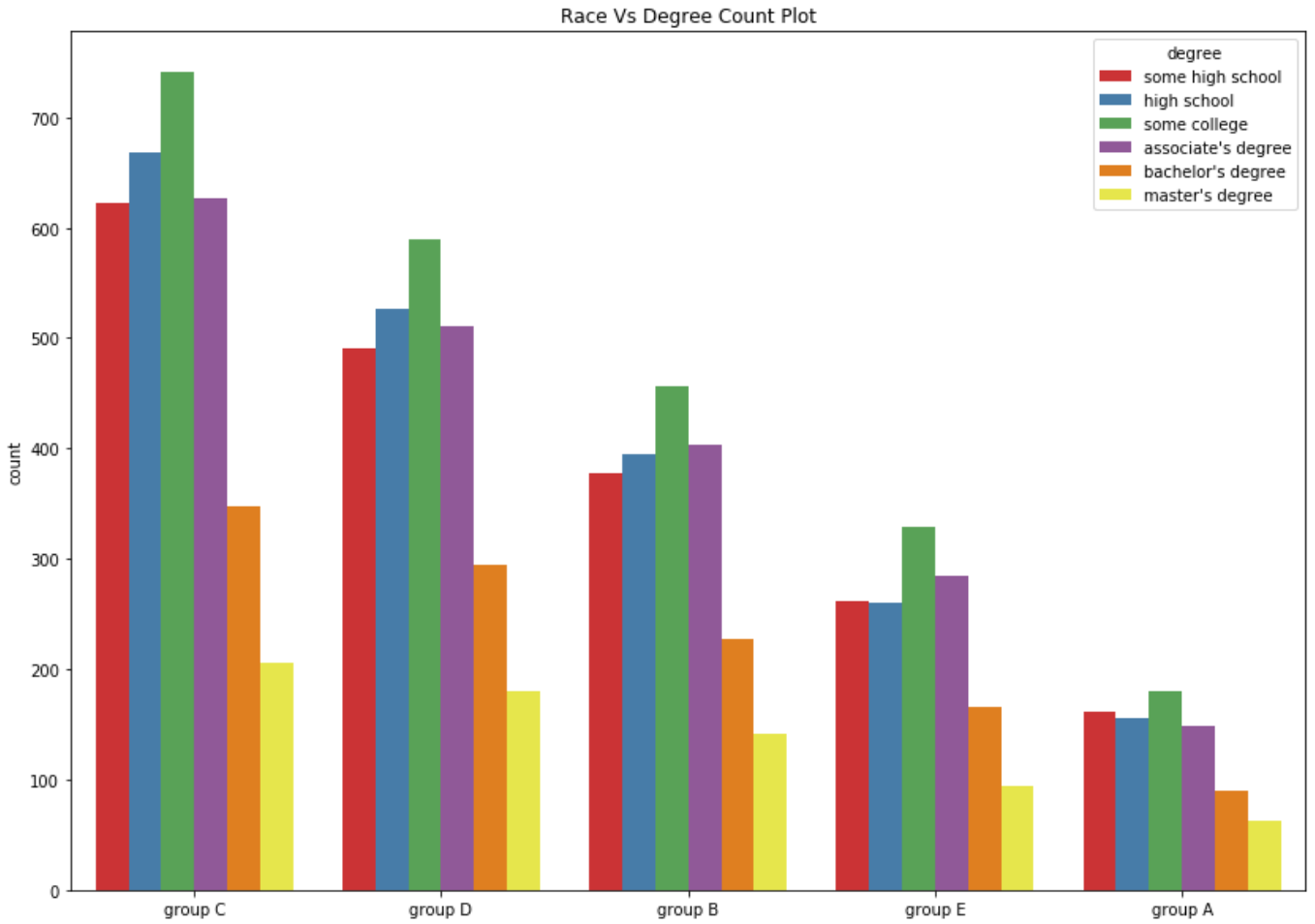
# Introduction

- Information from 10,000 students
  - Gender ( M / F )
  - Race/ethnicity
    - Groups A - E
  - Parental level of education
    - Some high school
    - High school
    - Some college
    - Associate’s degree
    - Bachelor’s degree
    - Master’s degree
  - Lunch
    - Standard vs Free/Reduced
  - Test preparation course ( Yes / No )
  - Math score (1-100)
  - Reading score (1-100)
  - Writing score (1-100)

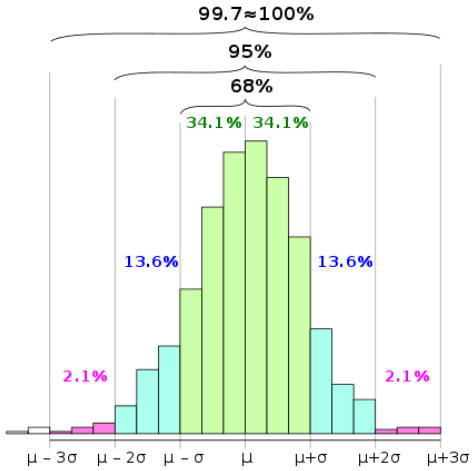


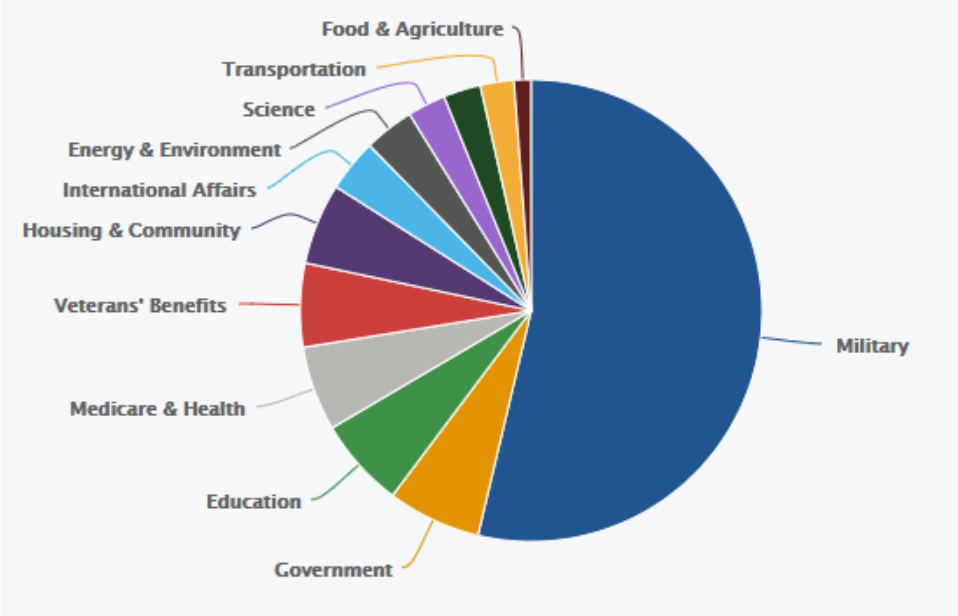
# Business Question

## Where is the best allocation of money into education?

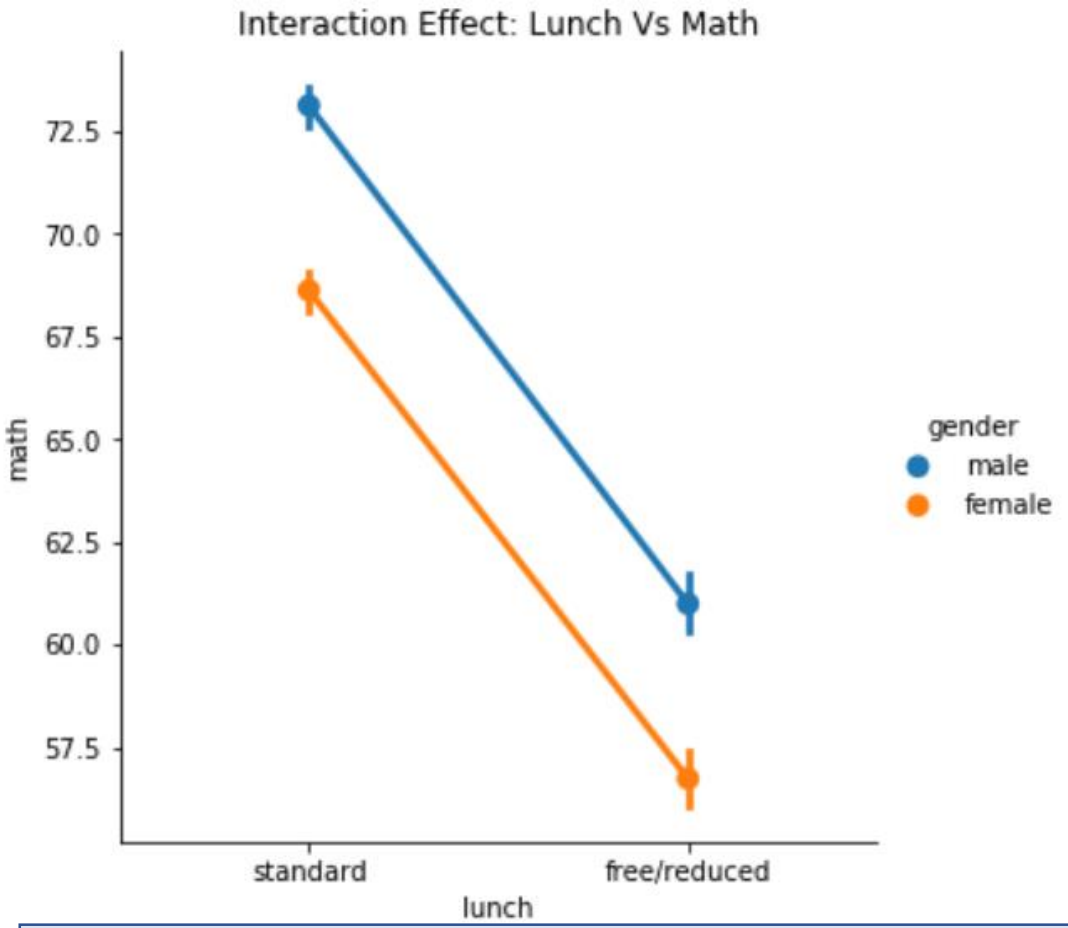
- Measured by Pass Rate
  - Standardized test scores
    - Pass if the student's score was 1 Standard Deviation above the mean

| Subject | AVG | Standardized |
|---|---|---|
| Math | 67 | 51 |
| Reading | 70 | 55 |
| Writing | 68 | 53 |

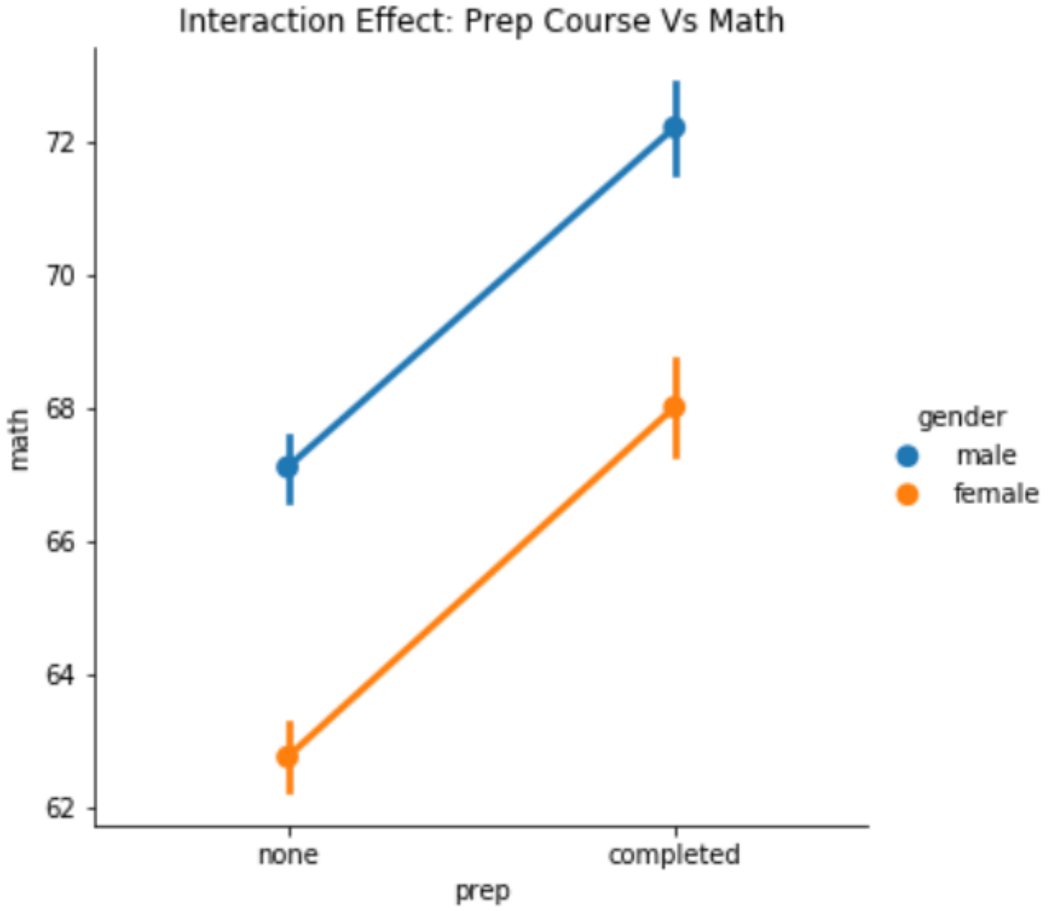


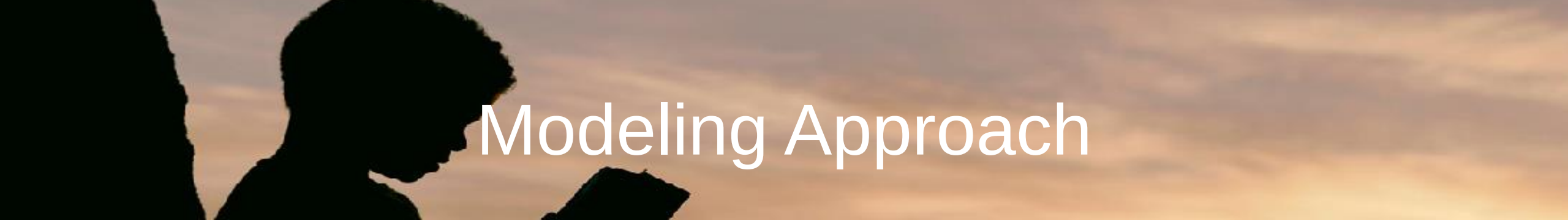
# Interaction Effect




11 point difference in standard vs free/reduced lunch




5 point difference in completed exam prep course vs without



# Modeling Approach

- Logistic Regression
  - Binary Outcome – which students passed?
  - Give relative importance of each variable
    - Odds ratio shows how much more likely the variable will pass

| Feature | Odds |
|---|---|
| Lunch – Free/Reduced | 0.92 |
| Race Group B | 0.88 |
| Parent – High School Diploma | 0.84 |
| Parent - Some High School | 0.77 |

| Feature | Odds |
|---|---|
| Lunch - Standard | 1.95 |
| Prep Course – Completed | 1.74 |
| Parent – Master's Degree | 1.70 |
| Race Group E | 1.59 |
| Gender – Female | 1.56 |
| Parent – Bachelor's Degree | 1.36 |
| Race Group D | 1.27 |
| Parent – Associate's Degree | 1.2 |

# What's next?

- Where to allocate the funds?
  - Increase education funding in
    - Potential first generation college students
    - Low income schools
    - Underperforming minority groups
  - Research for more data
    - Look at class averages
    - Follow student's progress