Examining the CSE Undergraduate Admissions Pipeline

Sachin Mehta, Sam Crow, and Wesley Lee CSE 512 Spring 2016 - Final Project

Introduction

Problem

- Cohort of CSE 142 students from 2012-2014
- Pipeline to CSE Major
 - CSE 142
 - CSE 143
 - Application
- Not all students who express interest in the CSE major apply
- Who continues in the CSE pipeline?
- How do the individuals who continue differ from those who drop out?

Data

- Student demographic information
- Survey data from CSE 142
- CSE 142 and CSE 143 grades
- Application information and results

Motivation

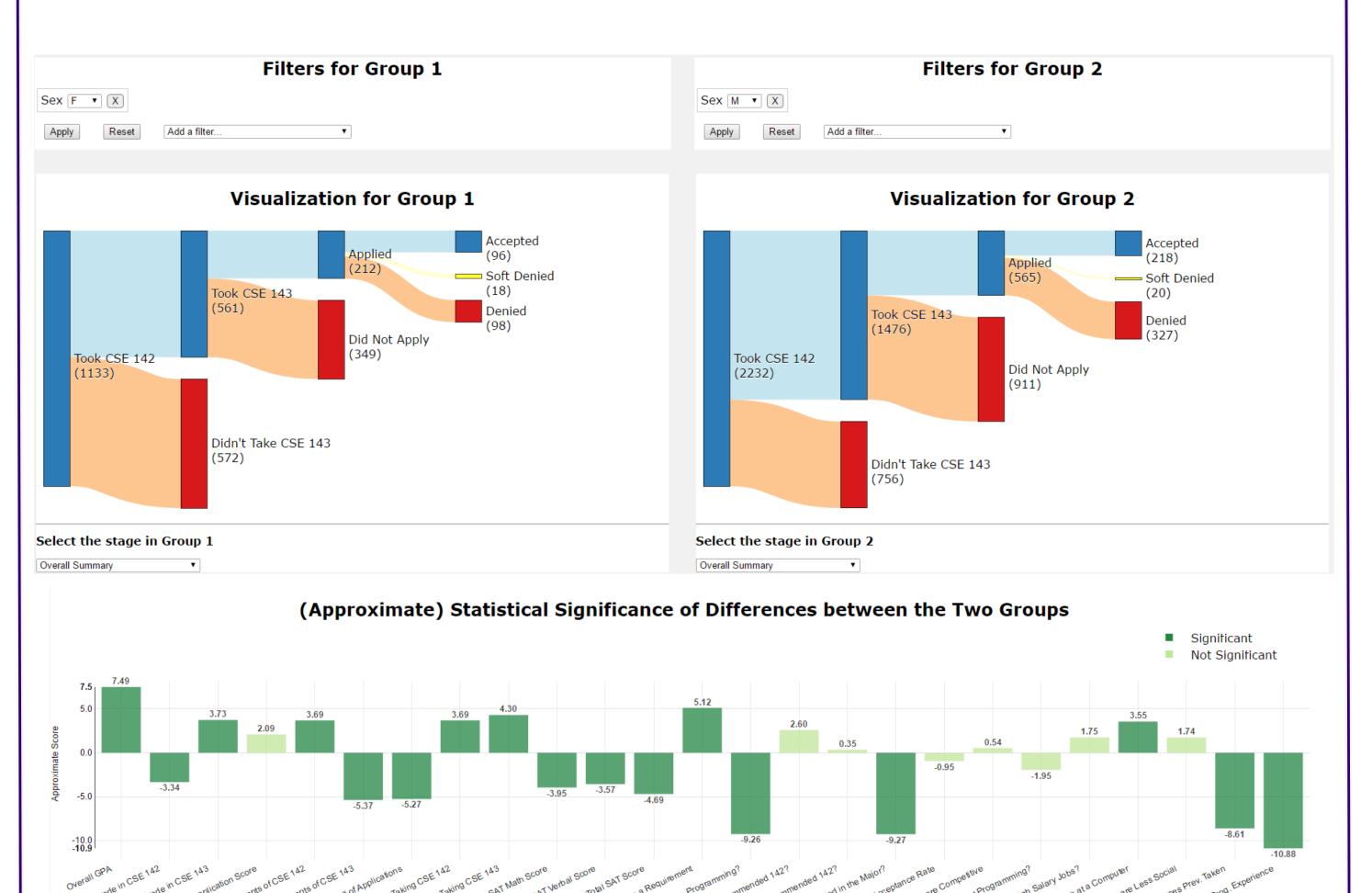
- Identify which individuals are most likely to drop out of the pipeline and at which stage
- e.g. examine race or gender disparities
- Improve retention at these stages

Challenges

- Different data available for each student based on progression through pipeline
- Large number of covariates avoid data fishing
- Each stage of the pipeline can be attempted multiple times
 - Students can retake CSE 142 and CSE 143
 - Students can apply to the major multiple times



Visualizations used in Demo



Summary Tabl	le for Group	1
VARIABLE	MEAN	DEVIATION
Overall GPA	3.28	0.48
Grade in CSE 142	2.80	1.04
Grade in CSE 143	3.07	0.79
Application Score	3.51	1.00

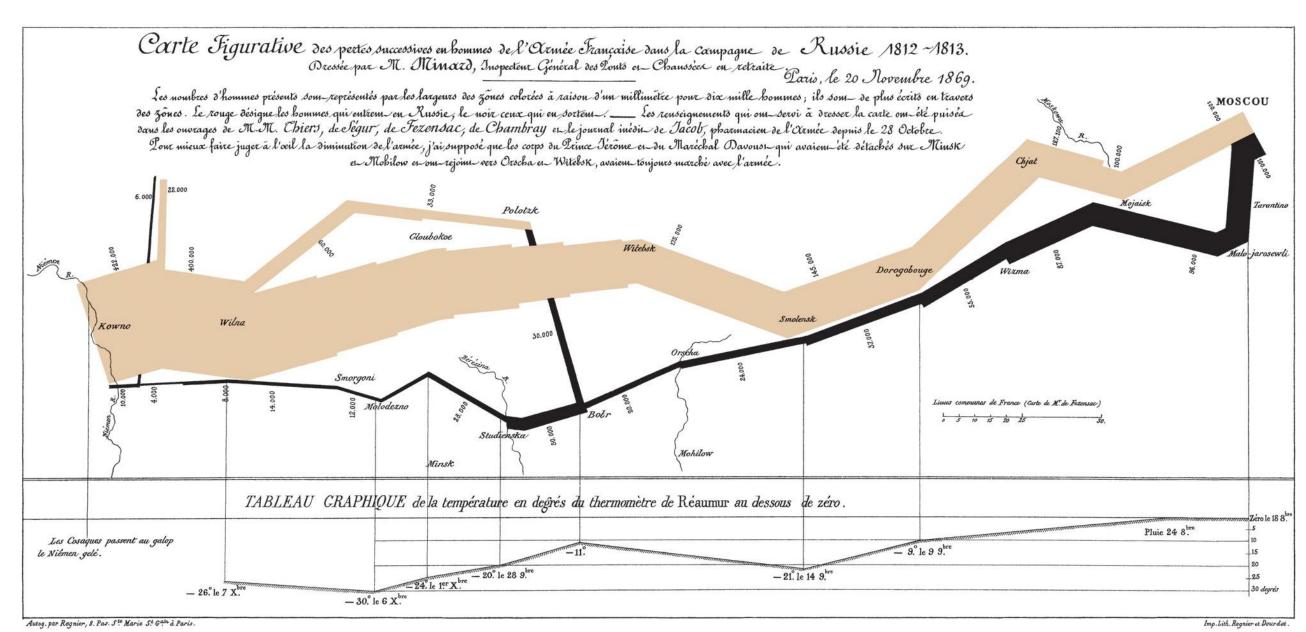
Summary Table for Group 2					
VARIABLE	MEAN	DEVIATION			
Overall GPA	3.14	0.57			
Grade in CSE 142	2.93	0.99			
Grade in CSE 143	2.91	0.93			
Application Score	3.34	0.97			
# of Attemnts of CSF 142	1 54	0.73			

Methodology

of Attemnts of CSF 142

Sankey Diagram

Flow chart where flow width encodes quantity



Testing for Differences between Groups

- Welch's t-test for differences in mean for each covariate
- Use Bonferroni correction to account for multiple comparisons

Demonstration

Goal

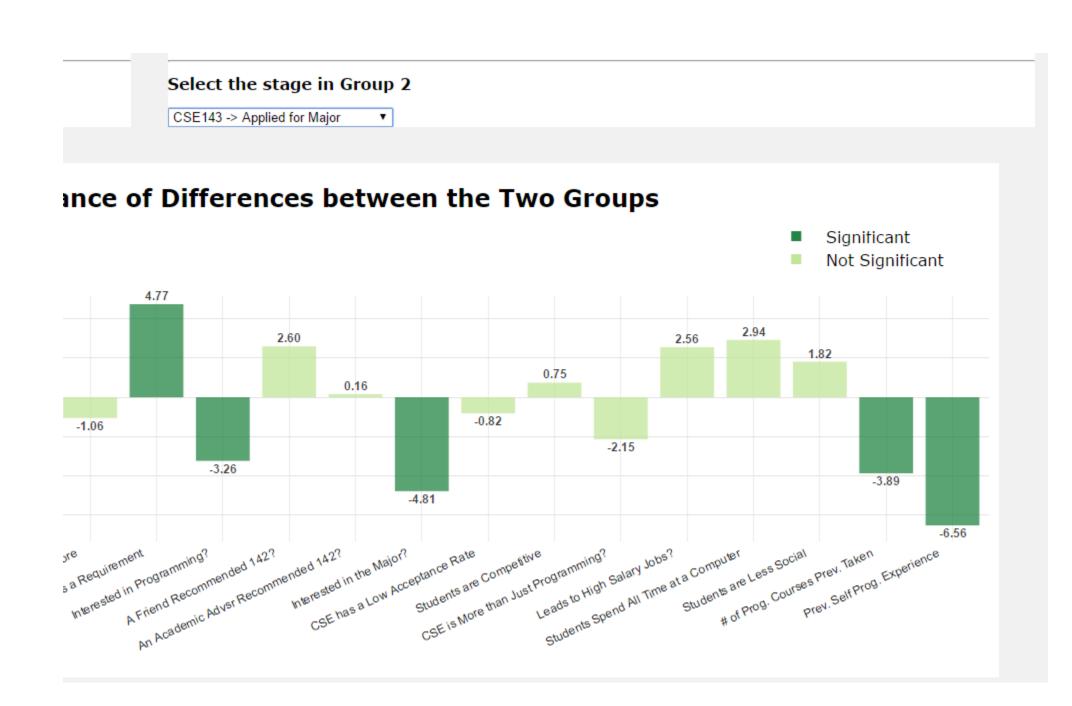
• Investigate differences between male and female students

Comparing Overall Summaries

- Higher percentage of males take CSE 143 after taking CSE 142
- Going into 142, female students are more likely to
 - view the class as a requirement
 - show less interest in CSE
 - have less experience programming

Comparing Applicants to the Major

• Same results hold when comparing female applicants against male applicants



Future Work

- Track students until graduation
- Integrate visualization with SQL for improved data handling
- More detailed visualization of "multiple attempts" issue

Acknowledgement

We would like to thank Stuart Reges, Alexander Miller, and course staff for their valuable suggestions and feedback.