BSC

STUDENT SUCCESS

PETE VANZANDT, CECE LACEY,
DOROTHY ALEXANDER

BUSINESS PROBLEM

- We decided to analyze Birmingham-Southern College graduation rates from 2014 to 2018
- We want to be able to give BSC insight on their students' success rate on campus. Success rate is measured by whether the student graduates from Birmingham-Southern College
- In order to approach this problem we used a variety of machine learning techniques.

OVERVIEW

Focus:

- Impact of a student's courses and grades on graduating from BSC

Analyzed

- We analyzed four years of freshmen cohorts (2014-2017)
- Looked at the individual classes taken by the individual student during each term
- Looked whether the student ended up graduating within that 4 year period

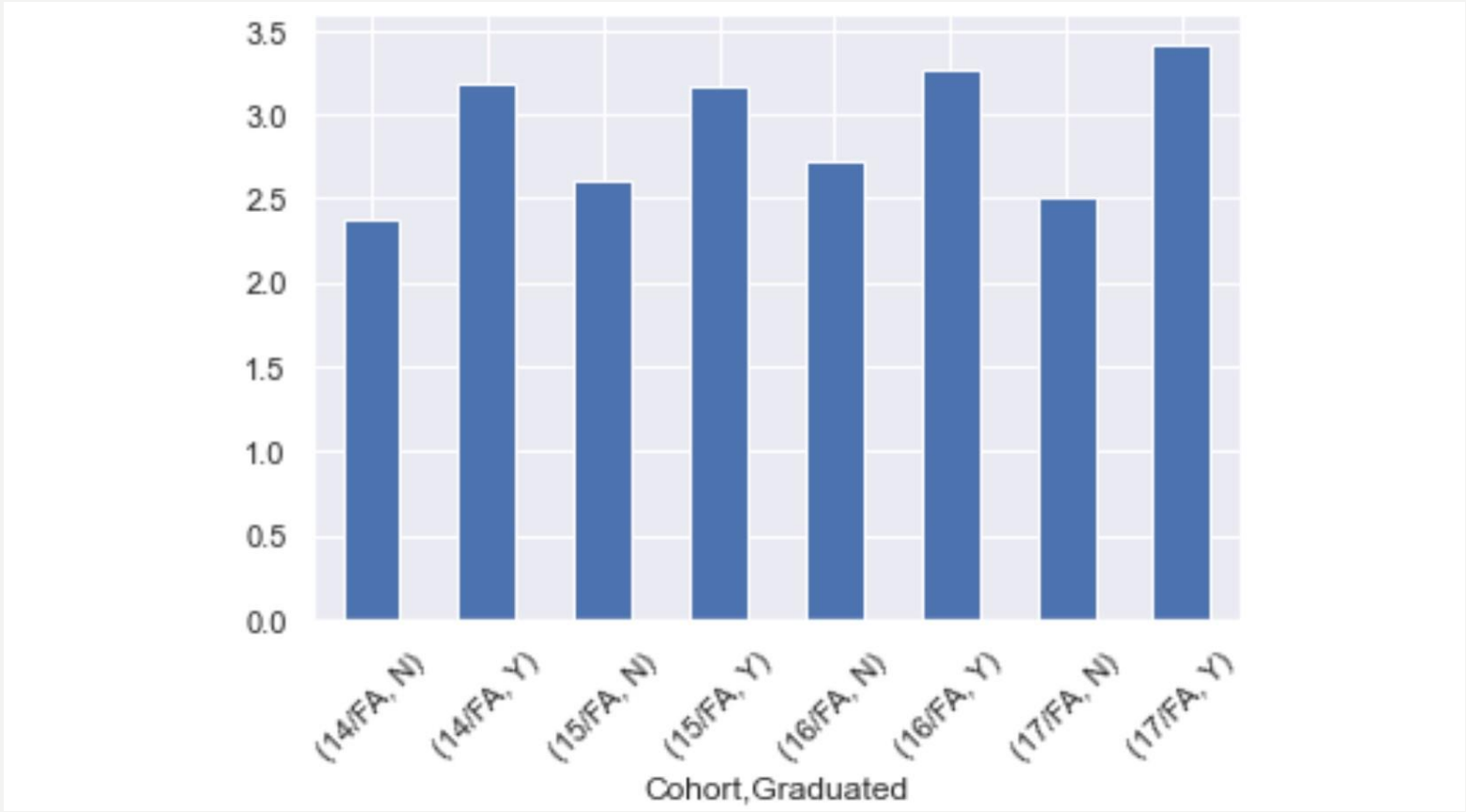
DATA

- Birmingham-Southern College student dataset
  - Student cohort graduation data
  - Longitudinal student transcript course data
- Target: Graduated? Yes or No
- Independent Variables: starting cohort, final gpa in courses, course title

METHODS

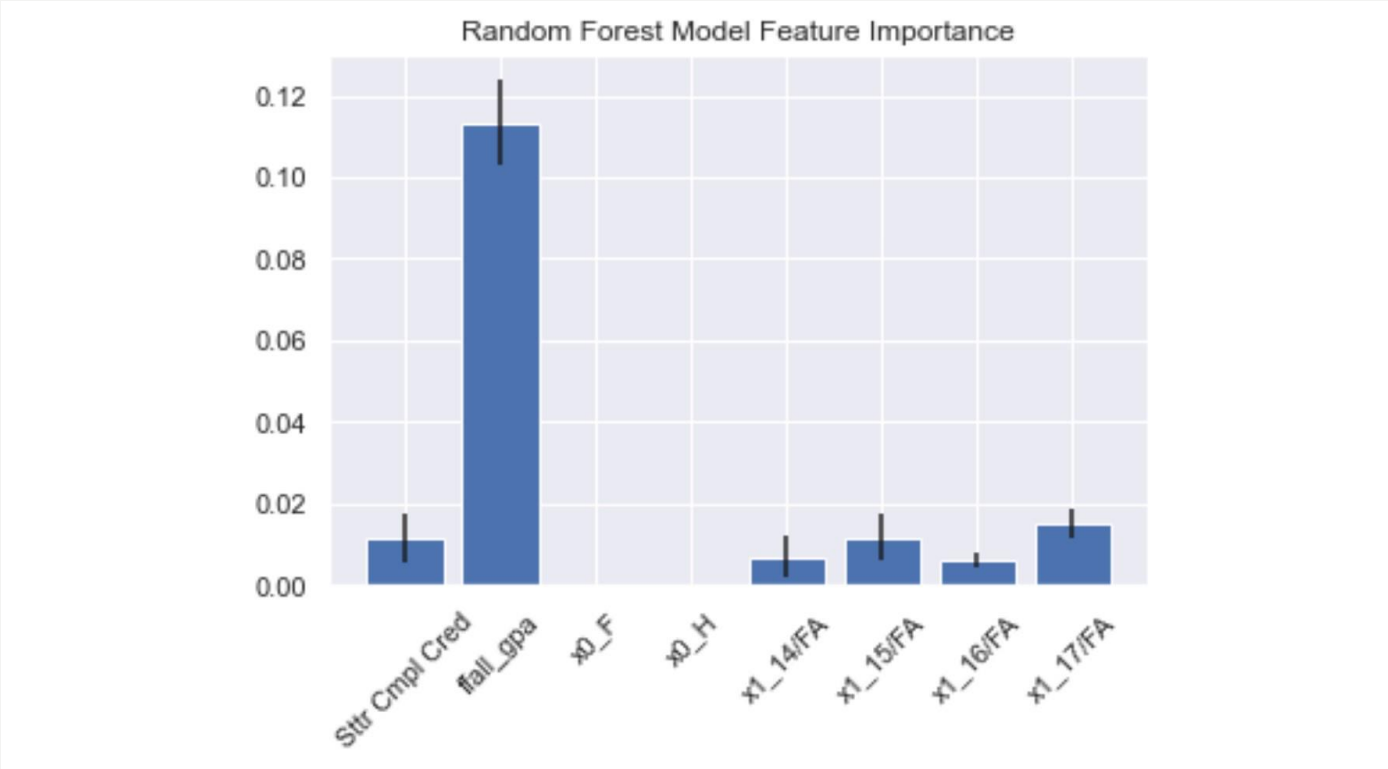
- Exploratory Data Analysis
- Data Preparation and Cleaning
- Basic Models
  - Logistic Regression
  - K-Nearest Neighbors Classifier
  - Decision Tree Classifier
  - Random Forest Classifier
- Complex Sequence Model
  - Machine Learning with Recurrent Neural Networks

GRADUATION RATES



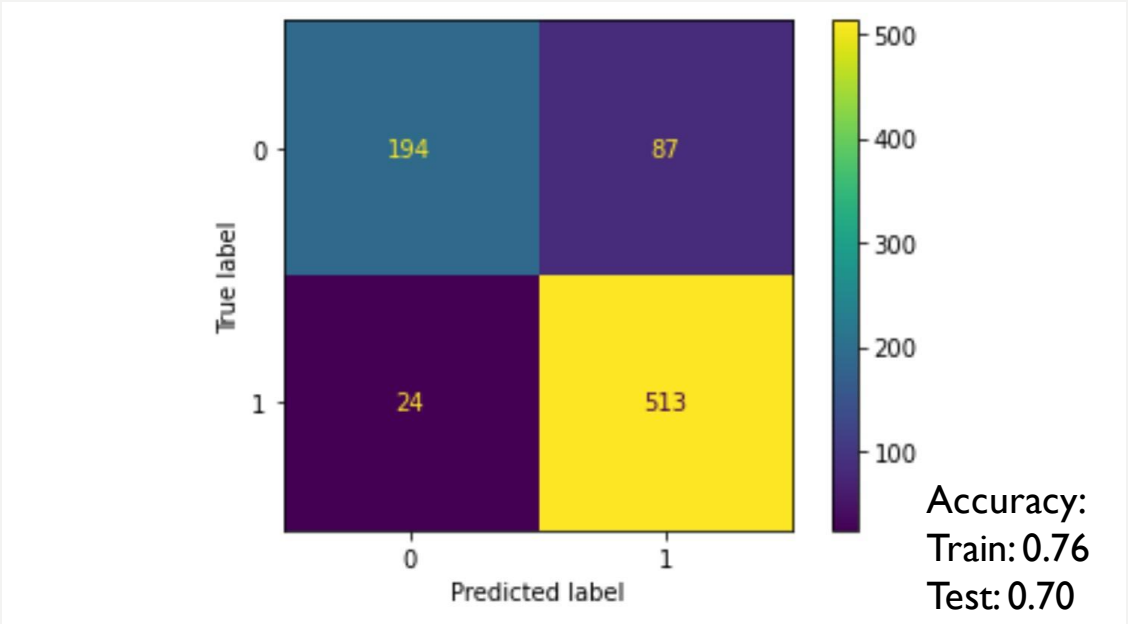
RANDOM FOREST MODEL

FEATURE IMPORTANCE



RANDOM FOREST MODEL

CONFUSION MATRIX



Accuracy:
Train: 0.76
Test: 0.70

RNN SEQUENTIAL MODEL
ACCURACY

Term	Grade Sequence	Course Sequence
1st Semester Freshman	71%	68%
End of Sophomore Year	89%	85%
After 4 Years of Coursework	95%	84%

CONCLUSIONS / IMPLICATIONS

- Basic Model
  - Had 74% accuracy based largely on Fall semester freshman gpa
- Complex Sequence Model
  - Grade sequences are better than class sequences for predicting the graduation rate.
- These models might be useful in providing guidance to students in early phase.

NEXT STEPS

- Include additional data from pre-College (e.g., HS gpa) sources
- Incorporate potential influence of major tracks, professors, class sequences, living situations, athletics etc.

CONTACT US

Pete VanZandt:

Email- pvanzand@bsc.edu

GitHub- pvanzand

CeCe Lacey:

Email- cecelacey@gmail.com

GitHub- cclacey

Dorothy Alexander:

Email- dcalexan@bsc.edu

GitHub- dcalexan