

Linear Learning

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Motivation

This project was self-assigned. After taking MATH 401, a course focusing on the applications of linear algebra, this project served as a way to display subject mastery. We worked with Dr. Todd Rowland of the UMD math department.

Execution

For the project, the dataset was downloaded from SportsBookReviewsOnline.com. It was validated by randomly checking some scores with CBS sports, and cleaning some of the data up (fixing typos). 2019 data was used because there was more interconfer-

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Below is the actual playoffs versus our predic-

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ence play as compared to 2020.

Following this, the Massey method was run. This was all done using Python in a Jupyter notebook. We now had a list of 280 teams with their relative rankings.

Lastly, now with all the rankings we were able to draw conclusions. As shown, Ohio State had the best overall ranking, followed by LSU (the actual national champion).

Impact

This project was mostly designed for self growth. While taking the course, many topics were touched on such as Markov chains, perspectives, game theory, and more. Weekly projects were completed using Python, a new skill. The project provided insight into sports analysis, as the Massey method is used in industry to help rank and inform betting odds. Lastly, working together in a group project gives opportunity for communication and cooperation. tions. The numbers is the difference in scores, for example we expect LSU to beat OSU by -8 points, or OSU to win by 8



A graphic showing our top 5 with their Massey ranking (left) compared to the AP top 5 rankings (right)

Future

Isaac plans to have a concentration in data science. Linear algebra is common in this field, so topics learned will be applicable.

Milan plans to do statistical analysis in his future, so methods such as least squared regression will be useful to him.

<u>Goal</u>

Our project goal was to use the Massey method, a linear algebra based sports ranking system, to rank the 2019 college football season. The Massey method is actually already used to rank college sports teams. However we wanted to see beyond the top 25 rankings, as well as get a purely objective ranking. The rankings also give a relative score, meaning we could attempt to predict scores between two teams that never played.