Final Project Description: Astro 9

Description

The final project is a synthesis of the various skills and techniques you have learned in class. The end product should be an Jupyter notebook with a combination of code, supporting text, and figures which provide the motivation for the project, description of the datasets used (either found or generated), the actual analysis performed, and conclusions (including future possible extensions).

Keep in mind that projects need to be completed by the due date, so make sure that you have at least some results with basic models before trying complex models. Including additional partially complete or exploratory analysis is encouraged.

Rubric

Creativity: 25%

Projects should be original and unique. Beyond not copying existing work, student should also find combinations of datasets and genres of analysis that have not already been performed or published.

Presentation: 25%

Projects should contain a number of diagrams/figures, in addition to plots, to properly communicate the key results of the analysis. Papers should be attractively formatted and easy to understand.

Analysis: 40%

The results of the analysis should be convincing and interesting. Analysis should be complicated enough to yield find interesting results but not so complex as to lose the reader. More nuanced analysis should be compared to “naive” approaches when appropriate (i.e. don’t use a multi-layered residual neural network if a linear regression would work just as well).

Conclusions and Extensions: 10%

The report should describe possible extensions to the work (i.e. additional datasets or analysis) with some description of what those extensions might bring to the overall analysis.

Possible Examples

1) Election Simulating (a la Nate Silver's FiveThirtyEight)
2) Classification of Variable Stars
3) Bitcoin Price Movement Prediction
4) Optimal Airplane Boarding
5) Rudimentary Hydrodynamical Model
6) Correlations between Bay Area neighborhoods average rent and location