The Most Important Statistics on the PGA TOUR

Author Name

Project URL: https://github.com/userID

**ABSTRACT**

Write a short abstract that summarizes what the project is about. Explain briefly the motivation behind the project and state the specific goals you would like to achieve from the project. Briefly summarize the approach you use (e.g., I formulated the problem as a binary classification or regression or clustering problem and applied method X to solve it). Finally, discuss the results you have obtained and state whether you are able to achieve the goal.

# INTRODUCTION

For introduction, you need to include the following information:

1. Start by providing a background description of the problem. Specifically, explain the application domain of the project and give a rationale why this is an interesting problem. Provide other background information needed to understand the application domain. For example, if the project is about predicting the outcome of an online game between two teams, explain what that game is about, what is the scoring system, is there only 1 or multiple players per team, etc. If the project is about sentiment analysis on twitter data for some predictive modeling application, explain what sentiment analysis is and why it is useful for the problem.
2. State the goal or hypothesis of the project. Explain clearly how you plan to achieve the goal. For example, suppose the goal is trying to determine whether user sentiment in twitter data provides useful information to predict changes in the price of a stock. Then the plan might be to apply regression method on a combination of historical price and twitter sentiment data and evaluate whether the prediction results are better than using historical data alone.
3. Briefly describe what type of data you have collected and analyzed in order to test the hypothesis in part 2 above (you don’t need to give too much details about the data here as you will provide the in-depth discussion about the data in Section 2).
4. Explain the challenges encountered when collecting, preprocessing or analyzing the data. Describe what are the steps you took to overcome these challenges.
5. Discuss briefly the findings of the project. Were you able to achieve the goal or prove/disprove the hypothesis?

Permission to make digital or hard copies of all or part of this work for personal or classroom use is granted without fee provided that copies are not made or distributed for profit or commercial advantage and that copies bear this notice and the full citation on the first page. To copy otherwise, or republish, to post on servers or to redistribute to lists, requires prior specific permission and/or a fee.

*CSE881-2015*, Month 1–2, 2004, City, State, Country.

Copyright 2004 ACM 1-58113-000-0/00/0004…$5.00.

# DATA

Give a detailed explanation about the datasets you use. Specify the sources of the raw data (give a URL citation), how you collect them, and what is the underlying format (e.g., CSV, JSON, etc). Did you use a crawler or write some script to collect the data or are you simply downloading the data (e.g., from Kaggle website). Do you have to fuse/merge data from different files and if so, how did you do it (e.g., did you join them based on some key attributes). What are the features/attributes in the raw data you have collected (before preprocessing). Give examples of those features/attributes. If the number of features is small (say less than 10, you should list them in a table).

Next, discuss about characteristics of the data you have collected. For example, if it is a time series data (e.g., tweets or stock market data), how long is the time period (e.g., 2 years of data from April 2016 to April 2017). If it is spatial data (e.g., crime data), what is the location (e.g., New York city or Chicago). Explain some of the data issues that must addressed. For example, does it have a lot of unnecessary features that must be discarded? Does it have a lot of missing values? What is the size of the raw data (how many sample observations and features)?

State the preprocessing steps you have performed on the raw data. For example, did you have to impute the missing values or did you simply discard them? Did you have to merge data from multiple sources? Did you create a sample of the raw data, and if so, what is your sampling approach? Did you do any Z-score transformation to remove trends or seasonality in the data? Did you find any outliers and remove them? Did you apply any discretization method on the attributes (e.g., to convert time of event to time of day – morning, afternoon, evening)? If so, what method did you use? Did you have to perform some calculations to create the data frame object you need to apply classification or regression? For example, to predict the outcome of a game, did you have to calculate some statistics about the teams based on their previous k games and use them as features to predict the outcome of their next game?

Finally list the set of features you use to create the Dataframe object for your data analysis software. For example, if it is a classification or regression problem, explain what are the predictor attributes used and the corresponding response (target) attribute. If it is a classification problem, state what are the classes. If it is a recommender system problem, explain how the final data look like (e.g., is it in a 3-column format: user, product, rating). How many users and products are there? If it is a crime data, how many neighborhoods and type of crimes are there?

If possible, list all the attributes you have created in a Table. Report the size of the final dataset after preprocessing, i.e., the number of rows and columns of the data frame you have created. The final dataset corresponds to the data frame object will be provide to the data analysis software (e.g., scikit learn or Python surprise) for model fitting/training. You should also report the dataset size in Mbytes. You should upload the final dataset you have created on the project GitHub page (unless the size is too large). Do not upload the raw data unless you have permission from the original data owner. In particular, Twitter prohibits any publication of their raw data on public domains. Kaggle also has similar policies. Make sure you read carefully the acceptable use policy of the website from which you have downloaded the data. If you have any questions about publishing the final (processed) data, please inform the instructor. If it is human subject data, make sure there are no identifiable attributes in the published data.

Note that this is an important section to demonstrate to the instructor the amount of work you did for the project. If all you did was to simply download a dataset that has already been nicely prepared (e.g., Kaggle data) and there is little evidence you had performed much preprocessing, then you will not receive much credit for the project.

# METHODOLOGY

This section should present details of the methodology you have implemented for the project. If possible, draw a high-level diagram or flowchart to summarize the process – from data collection and preprocessing to data analysis. State clearly what method you used to do the analysis (e.g., I use support vector machine or decision tree classifier to perform my classification or I use matrix factorization from Python Surprise toolkit to do the recommendation).

If it is a predictive modeling or recommendation problem, describe how you create the training and test sets. Did you do cross-validation to select the model hyperparameters? If it is a clustering problem, what is the distance measure you use? How do you decide the number of clusters in the data?

Finally, give a brief summary of the the code you have written for this project. For example, you can summarize it as follows:

* Collection.ipynb: this is the Jupyter notebook file that I wrote to collect data from Twitter.
* Preprocess.ipynb: this is the Jupyter notebook file to look for tweets that contain a specific keyword and do sentiment analysis on the tweets. The output of the script is ….
* Modeling.ipynb: this is the Jupyter notebook file to perform the classification task of the project.

State what other auxiliary software you need to replicate the results of your project. For example, if you’re using some sentiment analysis software, make sure you report it in this section. Give the URL of the software.

# EXPERIMENTAL EVALUATION

This section describes the experimental setup and results you obtain.

## Experimental Setup

This section should include:

1. Computing platform (what operating system and hardware you use to do the experiment). Are you using AWS cluster? If so, how many nodes?
2. What baseline methods did you to compare against your approach? Make sure you report the results of your method as well as the baseline methods. This is important to demonstrate whether your project was successful.
3. What evaluation metric did you use to report the results (e.g., accuracy, root-mean-square-error, F1-measure, etc).

## Experimental Results

This section should include a description about the experiments you have performed and the results obtained. If possible, try to summarize the results in a figure or a table. In addition to reporting the final performance numbers (e.g., accuracy), a good project report should examine in details the model created by the data analysis software. For example, if you’re building a regression or classification model, check the model coefficients to determine what features are important for making the model predictions (see the lecture notes on how to access the model coefficients). Discuss the significance of the results or any new unexpected insights revealed by the results.

Finally, state whether the project was successful. If not successful, explain the reasons that could affect the poor results you have obtained. What steps you could have taken to alleviate the problem.

The grading of the project does not only depend on how successful are the results, but also, how much detailed analysis you performed to make sure your findings are correct.

# CONCLUSIONS

Summarize the overall findings and contributions of the project. If possible, provide suggestions for future work that could improve what you’ve done for the project.

# REFERENCES (at least 3 references)

1. Bowman, B., Debray, S. K., and Peterson, L. L. Reasoning about naming systems. *ACM Trans. Program. Lang. Syst., 15,* 5 (Nov. 1993), 795-825.
2. Ding, W., and Marchionini, G. *A Study on Video Browsing Strategies.* Technical Report UMIACS-TR-97-40, University of Maryland, College Park, MD, 1997.
3. Fröhlich, B. and Plate, J. The cubic mouse: a new device for three-dimensional iput. In *Proceedings of the SIGCHI conference on Human factors in computing systems   
   (CHI ’00)* (The Hague, The Netherlands, April 1-6, 2000). ACM Press, New York, NY, 2000, 526-531.
4. Lamport, L. *LaTeX User’s Guide and Document Reference Manual.* Addison-Wesley, Reading, MA, 1986.
5. Sannella, M. J. *Constraint Satisfaction and Debugging for Interactive User Interfaces.* Ph.D. Thesis, University of Washington, Seattle, WA, 1994.

Grading criteria

Note that the project accounts for 10% of your final grade. The project will be graded based on the following criteria:

1. Presentation - structure/organization and clarity of writing (including tables and figures).
2. Technical - Correctness and thoroughness of the analysis performed. What are the challenges faced and how well did you address them? How do you evaluate the performance of the method you'd applied to the data? How much detailed discussion you provide to explain the results you'd obtained (e.g., discussion about why the method works or didn't work on the data)?
3. Difficulty level - How large is the dataset used? How much effort you had to spend to collect, integrate, preprocess, and analyze the data? Are you implementing the project on a cluster or a single machine? What tools did you use (do you have to implement them or are you simply using existing libraries)?