DS 100: Principles and Techniques of Data Science **Date: June 24, 2019**

Discussion #1

Name:

A Big Data Fail

Consider the 1936 federal presidential election of FDR vs. Al Landon. The magazine Literary Digest's straw poll had correctly predicted the outcome of the previous five presidential elections. Running up to the election, they polled over 10 million individuals including

- magazine subscribers
- registered automobile owners
- telephone owners

and received responses from about 2.4 million of those polled. The Literary Digest predicted Landon would win in a landslide. By contrast, George Gallup's quota sample consisted of bi-weekly surveys of 2, 000 individuals, and correctly predicted a landslide for FDR.

1. What are some potential sources of bias in each of these polling schemes?

Data-Driven Study Design: COMPAS Algorithm for Predicting Recidivism

Recidivism is the tendency of a convicted criminal to reoffend. The COMPAS (Correc- tional Offender Management Profiling for Alternative Sanctions) algorithm, developed by the company Northpointe (now equivant), predicts recidivism risk based on variables related to criminal history, drug involvement, and juvenile delinquency. It is used by US courts for the purpose of case management, to predict a defendant's risk of committing more crimes.

2. We will examine the COMPAS algorithm and, in particular, a ProPublica study pointing to racial biases associated with it

(https://www.propublica.org/article/how-we-analyzed-the-compas-recidivism-algorithm). We will discuss general issues raised by the application of such algorithms, in terms of ethics, privacy, security, and governance. We will also walk through steps you might take to address questions related to the accuracy and potential racial bias of the COMPAS algorithm.

The questions are meant to be discussed with the people around you as a group and there is no right or wrong answer.

(a) What is the population of interest for COMPAS?

(b) What is the imagined utility of the algorithm in contrast to a human judge?

(c) What are some features or attributes that were used by COMPAS to design the algorithm? Are there features or attributes that you think should've been included or taken out?

(d) How do you define "accuracy" and "racial bias"?

(e) How does the history of criminal justice institutions inform the data used by the algorithm?

(f) How should data be collected or obtained to assess the accuracy of predictors like COMPAS? Would you sample at random from the population of interest?

(g) What are some ways we can assess the accuracy of COMPAS?

(h) Think about the concepts of false positives and false negatives in this scenario. What are the ramifications or costs of a false positive and/or false negative?

(i) Is the COMPAS algorithm fair? For whom? According to what/whose definition of fairness?