| A picture of a winding road and trees  Communicating Legal Precedent by Estimating Preparation Hours Needed for Criminal Cases | RESEARCH QUESTION  What is the best algorithm to estimate the number of required Preparation Hours based on the number of Trial Days for a coming criminal case?  Group 11:  Hamid Parsazadeh (997034472)  Isabel Bowman (1003469640)  Kuo-Lun Chang(1007618641)  Bethlehem Zebib(1008516660)  Ragave Vicknarajah (1003959610)  INF1344, Fall 2021 |
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**Project Description:**

Managing serious criminal matters such as murder, sexual assault, or weapon offences are very difficult, and each case requires a different number of Trial Days to resolve. Lawyers need a certain amount of Preparation Hours to effectively represent the case in court, however as they are paid by the hour, they will rationally ask for the maximum amount possible in order to maximize their earnings. To mediate this and ensure there is no needless overspending, budget management committees require some rationale to authorize a reasonable amount of Preparation Hours for each case. They often turn to historical cases to grant Preparation Hours based on precedent, looking at the number of hours granted for past cases with a similar number of Trial Hours.

Our team aims to ease the work of such budget management teams by devising a statistical method to estimate the number of Preparation Hours that have been historically granted based on the number of Trial Hours for each case. This project would end with a program that could receive a new case’s ‘Trial Hours’, and output an estimated ‘Preparation Hours’, based on historical data. This would allow for the legal precedent to be communicated clearly and numerically to the committee, thus reducing bias.

**Research Question**: What is the best algorithm to estimate the number of required Preparation Hours based on the estimated number of Trial Days for a coming criminal case?

**Available Data**: 11 years of resolved cases, i.e. historical data from 2010 to 2020. The data includes the number of trial days and authorized preparation hours for cases across various crime categories. The data also includes information on the accused’s gender, as well as court day and year. The files are in .csv and .xlsx formats.

**Initial Hypotheses:**

* There is a significant correlation between Trial Days and Authorized Preparation Hours.
* There is a significant difference between the distribution of different criminal charge categories

**Methodology**: Implementing various statistical Techniques through Python to develop a reliable algorithm which can estimate the number of required Prep. Time for a new case. In order to explore the relationship between Trail Days and authorized Preparation Hours we will run a regression analysis. We will also plot the data out on a scatterplot to see if there is a relationship between the two variables.

**Milestones:**

* Proposal submission date: October 27, 2021
* Descriptive Statistics Section: Nov. 18
  + Finalized descriptive statistics and data visualization
* Inferential Statistics Section: Nov. 20
  + Finalized Initial Hypothesis Testing
  + Finalized Model(s) fitting (Model’s development)
* Written report: Nov. 25
* PowerPoint Presentation: Dec. 5
  + Finalized PowerPoint Presentation
* Final review: Dec. 6
* Pre-recorded presentation: Dec. 7
* Final Project submission date: December 8, 2021