Assignment 5 – CS 4536/536: Programming Language Design
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Overview

This assignment is about interpreting data from user studies, with an emphasis on Likert data.

How Long Will This Take?

My goal is that most students will spend at most 13 hours/week on this course and that few will spend more than 15 hours/week, in total.

If you have spent more than eight hours on this assignment and are not done, you are **expected** to reach out to the course staff for help (office hours, chat, or email). It is our job to help you and your job to seek help when appropriate.

Grading

This assignment is worth 100 points. 75 points are for the programming part and 25 points for the written part. Your grade for the programming part is the sum of scores for each passing test case. Your grade for the written part is 25 * the fraction of problems for which you submit an honest attempt at a solution.

What to Read While Working on This Assignment

In addition to the lecture readings, you will likely find the official documentation for Rust helpful. The homework handout lists specific research papers which you are expected to reference while answering the problems. You are welcome to refer to other resources about data analysis.

Programming Assignment

Download and extract the programming assignment from Canvas. Your assignment is to implement all functions to meet their specifications as given in the comments. Point breakdown:

- 15pts agreement_to_score
- 15pts index_to_prompt
- 15pts index_to_key
- 15pts acquiescence_bias
- 15pts score

The main learning objective of the programming assignment is to understand how to analyze the data resulting from a Likert scale, including scoring the data and computing their acquiescence bias. It is intended to be less time-consuming than the previous assignments, in order to leave time for the written assignment, exam review, and any revisions students might make to previous assignments per the course resubmission policy.

Written Assignment

25 pts Data analysis

Interpret the data collected from your study to answer the research question of the study. The methods will depend on which style of study you did. Only undertake the method(s) relevant to your study:

- Survey/Quantitative Questions: Use the mean or median function to interpret your data, depending on what type of data you have. You are welcome to also compute any other statistics that are relevant to your problem, but not required.
- Interview+Activity/Qualitative Questions: Read the Qualitative Studies chapter of the HCPL textbook to familiarize yourself with the technique of **Ground Theory analysis,** because this technique was only mentioned briefly in lecture. Perform a grounded theory analysis of your results. *An exhaustive analysis can be very time-consuming, so it is sufficient to analyze data from 3 people to receive credit.* Take the written responses or transcripts, as appropriate, and:
  a. Perform open coding. Go through the data and assign short, open-ended labels (codes) that characterize people's to interesting sections of text from people's responses
  b. Perform axial coding. Review all the open codes and then write a short list of codes that combine the open codes into overarching categories
  c. Review the axial codes and then write a single *summative code* that captures the main conclusion of the data

Regardless which method you use, clearly restate your original research question and clearly mark the main answer to that question which you've arrived at

Use the results of the analysis to briefly (e.g. <= 1 paragraph) provide and justify your answer to your initial research question.

Optional bonus: 10 pts Creative Coding

This is a programming problem, but is listed under the written problems because it is ungraded. Write a creative program to express yourself, using any of the creative technologies mentioned in the textbook:

- Processing
- Twine
- Inform
- Penrose
- Context-Free Art

If your art is visual, include a picture in your submission, otherwise include the source code and submit it with your written answer to the previous question as a .zip file. Please explicitly indicate whether you are okay with the instructor sharing your work with the other students in class for fun.

This activity is intended to be open-ended and fun. If you're having trouble coming up with an idea of your own, you can do either of the following to receive credit:

- Look up a tutorial for one of these technologies, complete it, and hand in the completed work
- Download an existing piece of art that someone has published in one of these tools, **cite that piece of work in your submission,** and modify it / experiment with it.

Peer Reviews
There is no peer-review component in this assignment.