

Student's affirmation: I certify that I have neither taken help in completing this assignment nor helped anyone else with this assignment. I have never discussed this assignment with anyone other than the instructor and TA. I have not used ChatGPT, Llama, or other AI tools to create or influence my solutions.

(Signature) _____

Mandatory: Affirmation and signature on the first page; name on every page; submission as PDF.

If you make assumptions about any problem, state them, but be prepared to justify why they were necessary.

Problem	1	2	3	4	Total
Points:	22	30	30	18	100
Score:					

This assignment has 4 problems, for a total of 100 points.

Throughout, I prefer that you think afresh but if you come across a source on which you base your answer, please be sure to cite it. (Some problems ask for a specific author or source.)

- (22 points) Mark the following statements true or false. Provide a short explanation of about 10–20 words. You can and should provide a source where appropriate. Where the statement is about a paper, please specify the corroborating part of the paper (e.g., “Page 32, second para, lines 4–6”).
 - Triad closure—the idea that everyone feels some pressure to connect with their friends’ friends—is a consequence of social balance theory
 - On average (over all users), a Facebook user is friends with people who on average have more friends than the user has
 - On average (over all users), an X (formerly Twitter) user follows more people than follow the user
 - Yolum argues based on a simulated referral network that if each node adopts a policy of always providing a referral and each node updates its out-edges to point to the most useful other nodes, then the distribution of Page Ranks of the nodes follows a power law
 - Galton was right in that the median provided a more accurate estimate of the ox’s weight than the mean
 - Crowdsourcing necessarily requires that we use the crowd to validate the crowd’s responses
 - Crowdsourcing is susceptible to the biases of crowd workers that affect the integrity of their responses even if they are trying to be truthful and accurate
 - According to Law and von Ahn, human computation is not useful in cases that lack ground truth and instead rely upon cultural preconceptions of the workers
 - The outcome of the Linda problem from Kahneman and Tversky tells us that people are pretty good reasoners because though they may order the bank teller options incorrectly, they got everything else right
 - Tversky and Kahneman define the representativeness bias as arising due to the retrievability of instances
 - If a risk neutral agent prefers a lottery L_1 to a lottery L_2 where L_2 is a sure thing, then a risk averse agent would necessarily prefer L_1 to L_2
- Consider ordinary social interactions with respect to common bonds and common identity. Use about 60–80 words for each part.
 - (10 points) Is it possible for a social relationship to progress from one based on a common bond to one based on common identity?

If your answer is Yes, describe an example where it may happen. The example should show progression of one type of relationship to the other, not be an incidental combination of two relationships.

If your answer is No, describe why that would not make sense.

- (b) (10 points) Is it possible for a social relationship to progress from one based on a common identity to one based on common bond?
If your answer is Yes, describe an example where it may happen. The example should show progression of one type of relationship to the other, not be an incidental combination of two relationships.
If your answer is No, describe why that would not make sense.
- (c) (10 points) Would common bond or common identity relationships be more prevalent on short paths (in the style of six degrees of separation)? Explain your answer based on a reading of Milgram, Kleinfeld, and Granovetter. (Cite at least two sources. Cite any specific fact you identify from these sources.)
3. Consider the following scenario. A charity is running a sealed-bid auction where one or more sellers put up their Taylor Swift tickets (otherwise identical) for sale. Alice participates as a buyer in this auction. However, she fails to win a ticket. Alice approaches one of the winners and offers to buy their ticket from them for a price slightly higher than they paid for it in the auction.
- (a) (15 points) Identify and describe three assumptions made in our course that are relevant to such an auction from a theoretical standpoint. (40–50 words.)
- (b) (15 points) For each assumption separately, identify how the scenario (including Alice) could satisfy that assumption (even if the other assumptions you identified are violated) and produce the behavior described in this scenario. (60–80 words.)
4. Consider the following scenarios based on the following common assumptions. Suppose Alice values a model of Bluetooth headphones at \$45 and Bob values the same model at \$54. Alice initially owns the headphones and Bob doesn't.
- (a) (6 points) She sells the headphones to Bob at \$50. Explain whether the resulting allocation is Pareto optimal (40–60 words).
- (b) (6 points) She sells the headphones to Bob at \$60. Explain whether the resulting allocation is Pareto optimal (40–60 words).
- (c) (6 points) Callie takes Alice's headphones in lieu of a prior debt of \$9 and gifts the headphones to Bob. No money changes hands. Explain whether the resulting allocation (between Alice and Bob) is Pareto optimal (60–80 words).