

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:	10	20	35	35	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.)

- (10 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”).
 - Regimentation is illustrated by when a physician turns on a “Do Not Enter” light outside the door to a room where they are examining a patient
 - Our life cycle for norms indicates that whether a norm is satisfied or violated depends upon a combination of its antecedent and consequent being true or false
 - Muzafer Sherif’s experiments of the social influence on autokinetic effect indicate that people resist implicit suggestions from one another
 - Our experience with the Beauty Contest games shows that a participant who figures out the equilibrium answer can easily win such a game
 - The Hamming distance approach for judgment aggregation is susceptible to the situation where superficial changes in the problem formulation can change the result
- Consider the following independent scenarios and explain whether we can correctly assert Alice consented to the action in each case. Use the nine criteria discussed in class to produce your answer.
In each case, a Student Body presidential candidate promises to take some action and Alice votes for the candidate. The candidate wins and goes on to do what they had promised. Assume a Student Body President can do what is described.
 - (10 points) Promises to raise activity fees; Alice doesn’t think they will raise fees; upon being elected, they raise those fees.
 - (10 points) Promises to place recycling bins every 10 meters down the EB2 hall; Alice wants such bins in general; a new bin is placed 1 meter from Alice’s lab door, which annoys Alice.
- Imagine Netflix is changing its terms as follows from December 15.

If an account is established by an adult after December 15, the account holder may not share it with a minor unless the minor is their child.

 - (5 points) Write this as a norm (i.e., as a commitment, prohibition, authorization, or power) in the following form:

prohibited(antecedent, antecedent_deadline, consequent, consequent_deadline)

Some of the above elements may be missing in the English language statement above. You will need to set them appropriately.

Note that the deadline can be viewed as an interval. The syntax is left unspecified in this problem but you can imagine examples such as [now,] or [now, ∞] (each meaning now onwards forever), [December 1, December 3], [Payment, Payment+3d] (meaning from the time of the Payment to that time plus 3 days).

(b) (10 points) Draw a state diagram illustrating (in general terms) how the norm you specified progresses as relevant events occur (for simplicity, assume a clock event for December 15). Specifically, consider states such as null, satisfied, violated, and any others you need. Consider events such as create; the occurrences of *antecedent*, *antecedent_deadline*, *consequent*, and *consequent_deadline*; and any other events else you need. That is, the transitions in your state diagram should be labeled with the above events. Where you use a standard event such as *consequent*, explain how it maps to the events you defined.

(c) (10 points) Show the event schemas needed to compute with the above norm.

Recall that each event schema maps to a table of the same name and comprises a list of column names for the table along with an indication of which of these columns (at least one) form its key.

(d) (10 points) Suppose Alice is an adult and Bob and Charlene are minors, where Bob is Alice's son and Charlene is Alice's niece.

Describe some events (i.e., rows in the above tables) to show how a scenario has progressed. Demonstrate two alternative scenarios: one in which the norm you specified above is

- Violated for some instance.
- Not violated (e.g., satisfied or expired) for some instance.

4. Consider an electoral setting where three or more candidates vie for one position.

Recall that a *voting method* takes as input a profile (set of ballots, each with a total ranking) and produces a total social ranking.

Define a voting method called *Dorcet* in which we iteratively select a Condorcet winner and remove it from the running to compute a social ranking.

(a) (10 points) Give an example profile (as a table) involving four candidates, at least two ballots in which are different

- Make sure that Dorcet produces a *unique* social ranking for this profile (i.e., no reliance on tie-breaking).
- Show what social ranking is produced for your example profile, briefly explaining each iteration of the method.

(b) (15 points) Evaluate Dorcet with respect to each of the following properties, either (1) proving that it satisfies the property or (2) giving an example showing it does not satisfy the property (20–30 words each):

- Unanimity
- Transitivity
- Independence of Irrelevant Alternatives

(c) (10 points) State Arrow's impossibility theorem in the formulation discussed in class. Describe whether Dorcet meets the requirements of the theorem. Use about 60–80 words.