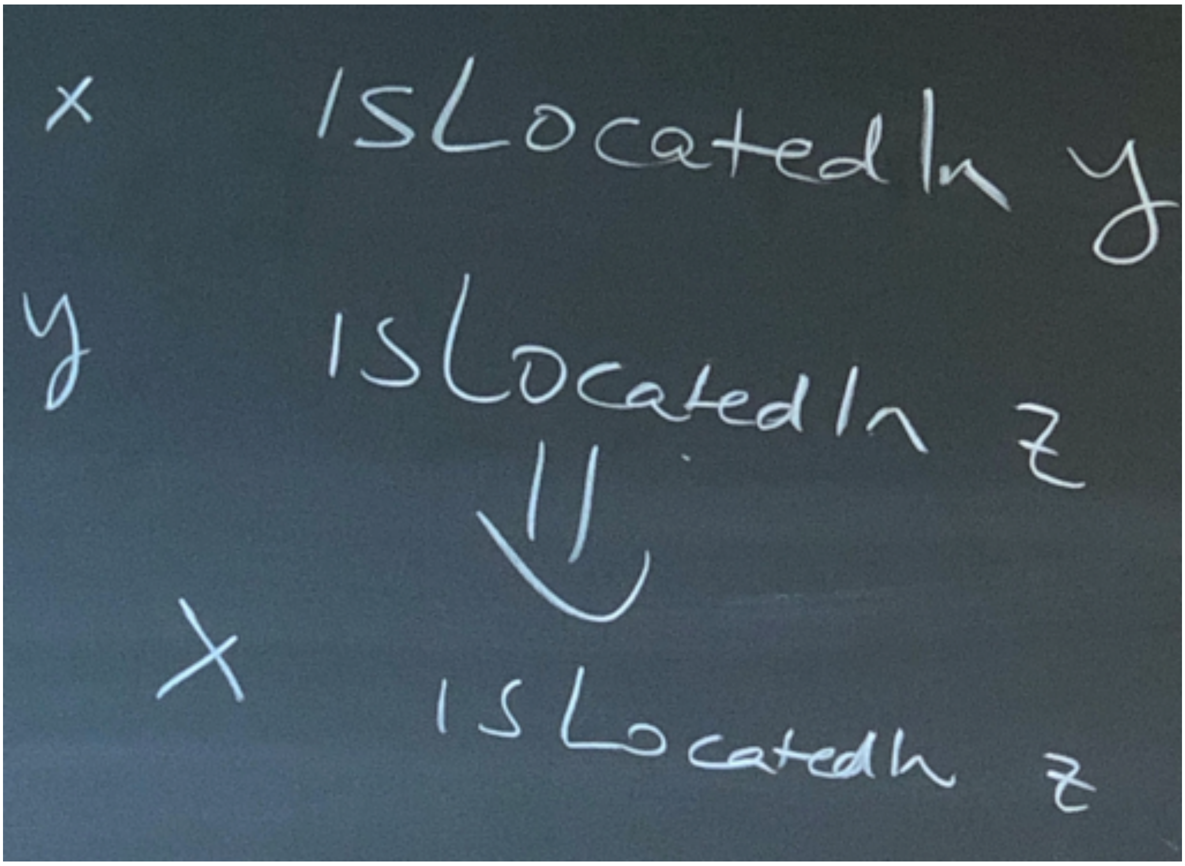
L14 Exercises

1.m4a
5 min, 51 secs
2,9 MB

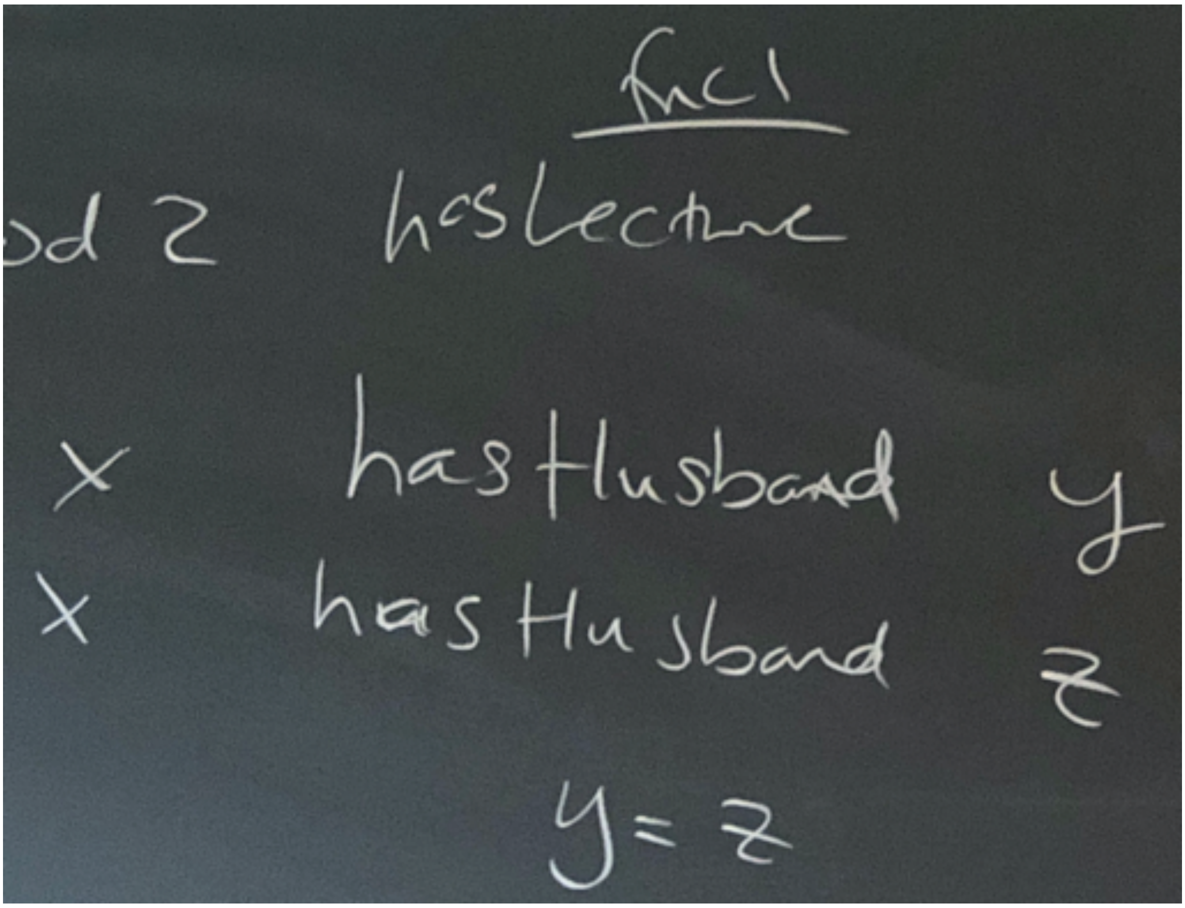
2.m4a
2 min, 27 secs
1,2 MB

2_vol2.m4a
34 min, 29 secs
80,6 MB

1. Give short answers to the following:
   - (a) Describe two relations that are provided by RDFS. (Don't worry about the syntax.)

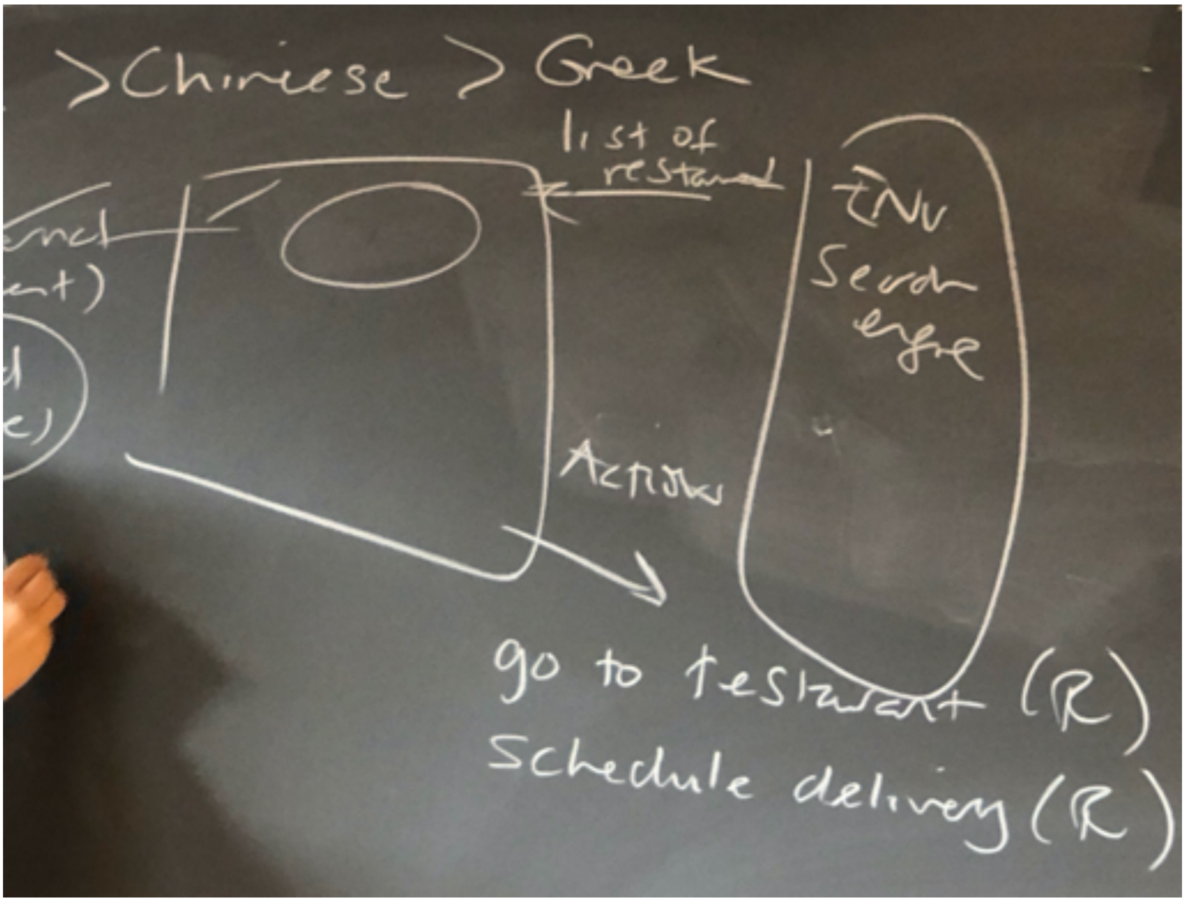


   - (b) Give an example of a transitive object property in OWL. Specify what the domain and range of the property is and why it makes sense to make it transitive.

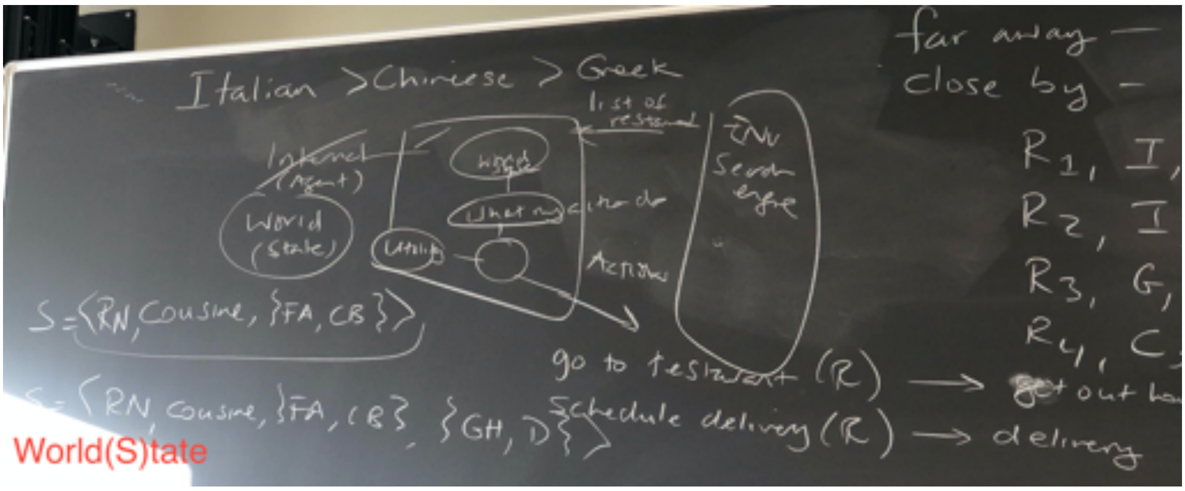


- (c) What is the advantage of representing protocols using commitments?
    - agent can reason and look at if the commitment is useful; what can be expected from the other side
- (d) If an agent’s goal is no longer achievable, what can an agent do? How can it decide how to proceed?
    - Drop goal; suspend goal; secondary goal (update it’s goal);

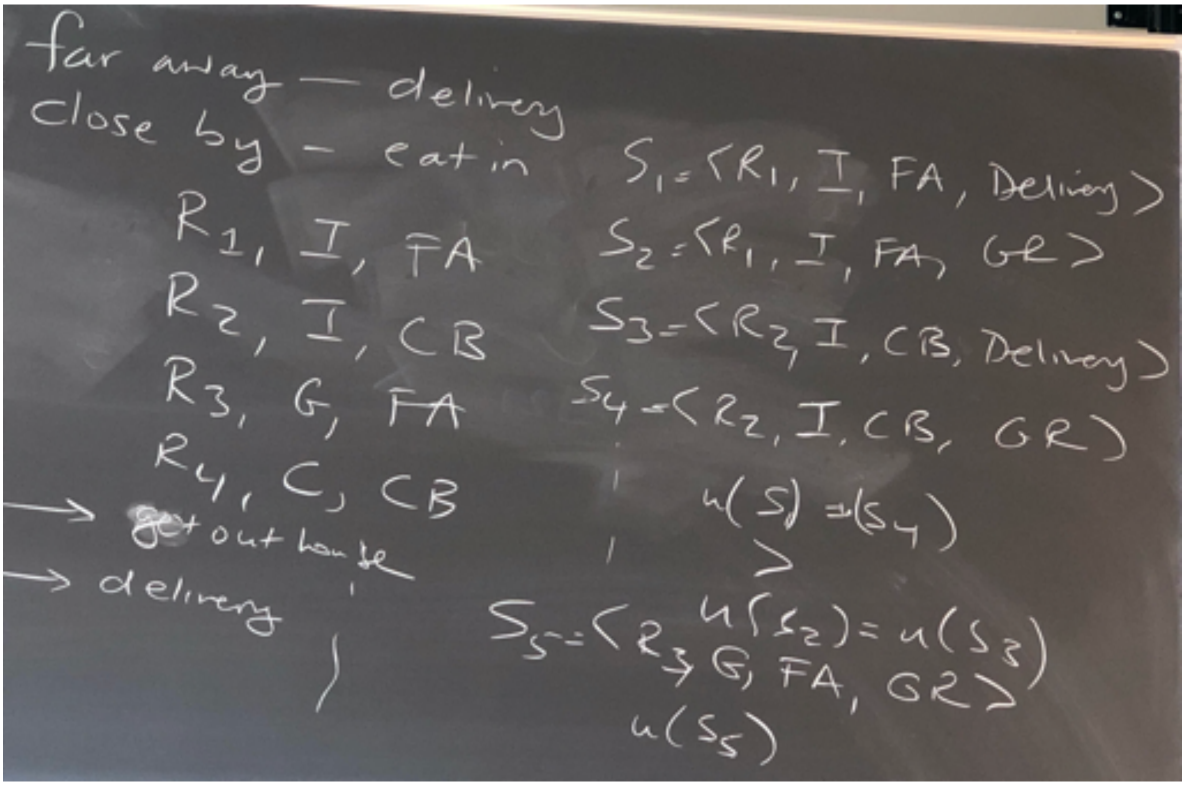
2. Consider an agent that helps its user to find dinner. The user likes Italian food more than Chinese food and the Chinese food more than the Greek food. Further, if the restaurant is far away, then the user prefers home delivery but if the restaurant is close by, she prefers to go to the restaurant. The agent can get the list of restaurants, their cuisine, and whether they are far away or not from a search engine. After considering the options, the agent tells the user which restaurant to go to or to schedule a take away.



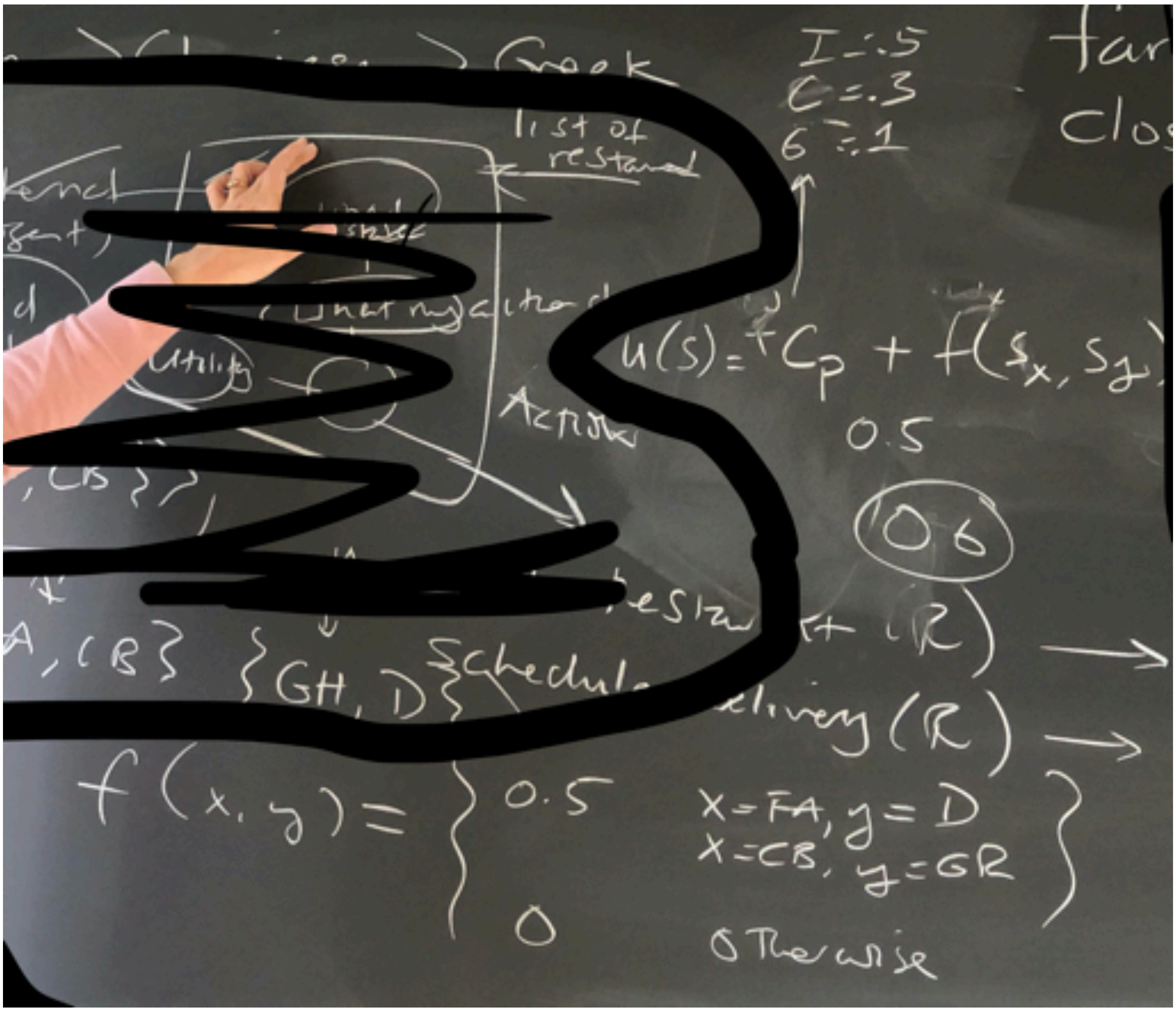
Design an agent that uses a utility-based architecture to carry out this functionality. Describe the components your agent would have. List its possible actions, show its states, give its utility function. (Don't explain a general utility-based agent, instead explain the contents of the components that your agent has.)



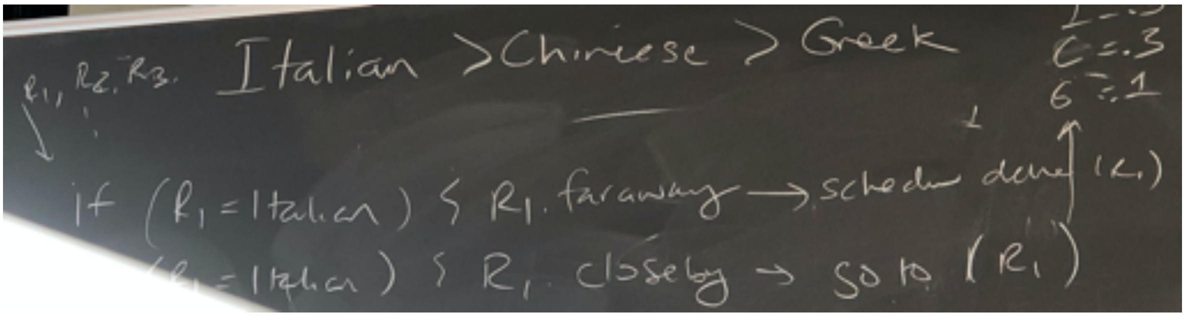
Utility representation for the agent above:



Utility function calculation:



Reactive agent representation on the same restaurant thing (not possible due to memory limitations and scalability):

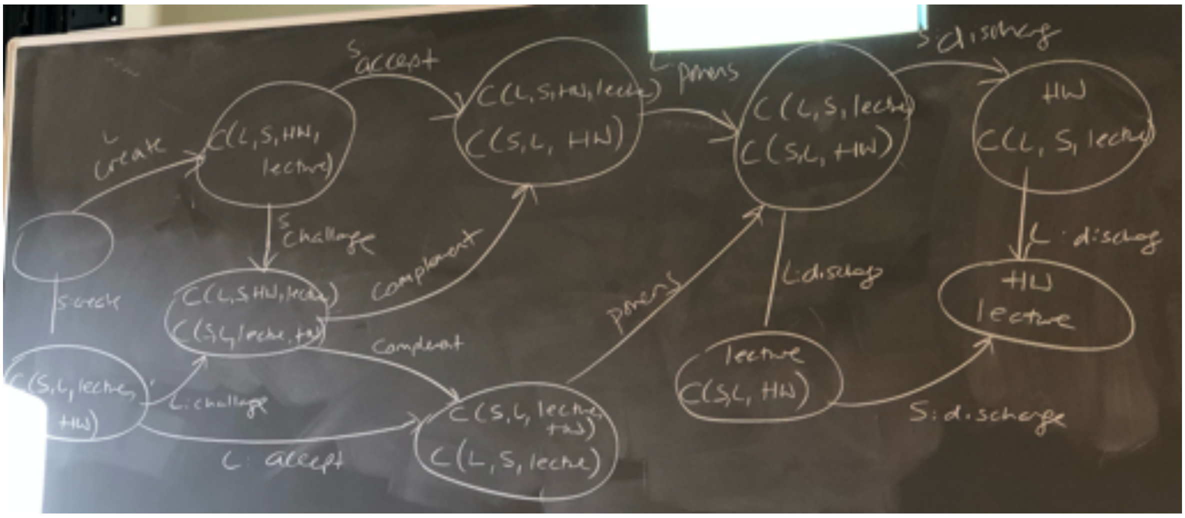


3-4.m4a
45 min, 59 secs
107,7 MB

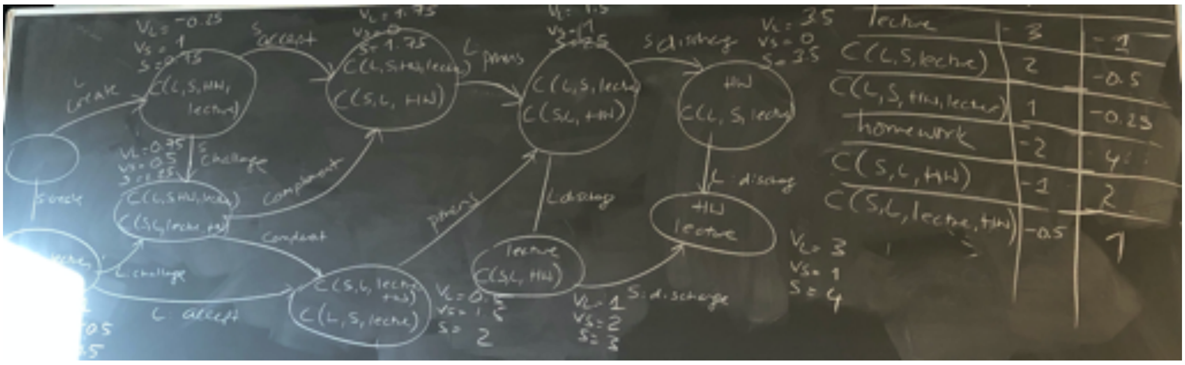
3. Consider a commitment protocol between a student and a lecturer. The student's goal in the protocol is to listen to the lecture, whereas the lecturer's goal is to have the student turn in a homework. The valuations for the student and the lecturer for various propositions and commitments are given below.

Condition	S's valuation	L's valuation
lecture	3	−1
C(L, S, lecture)	2	−0.5
CC(L, S, homework, lecture)	1	−0.25
homework	−2	4
C(S, L, homework)	−1	2
CC(S, L, lecture, homework)	−0.5	1

- (a) Show all possible executions of the protocol. Name which operator is being applied.

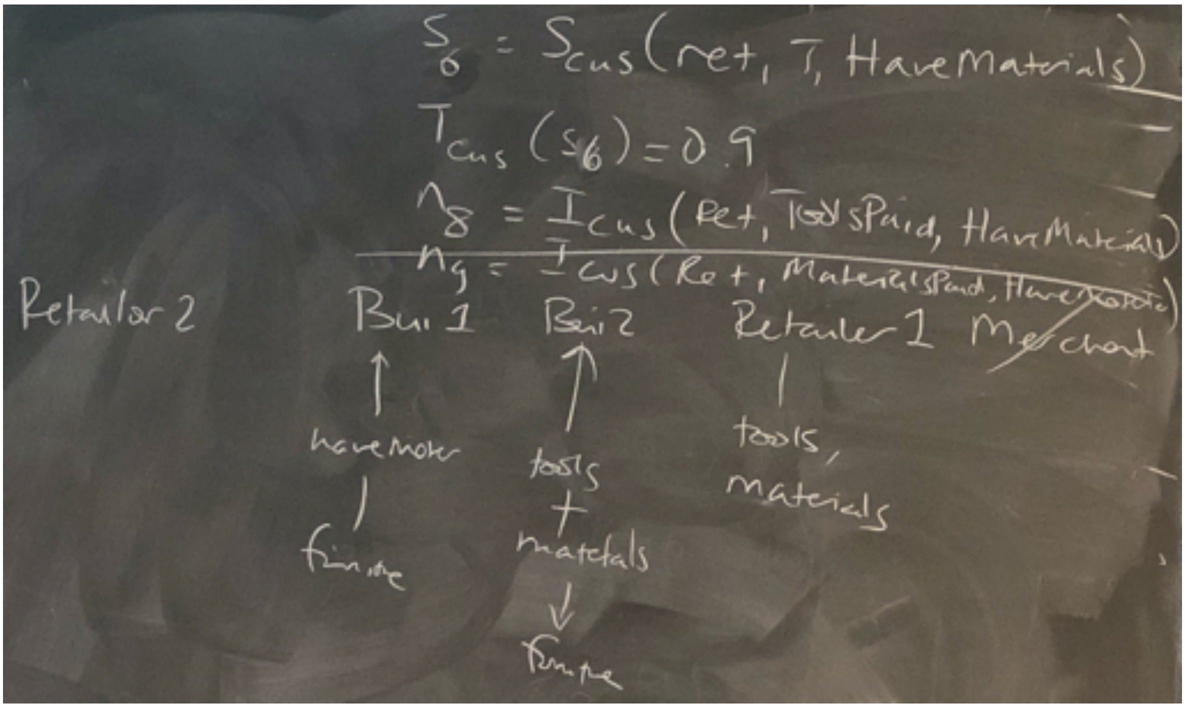


- (b) For each state, calculate its value for the student and the lecturer as well as the social welfare

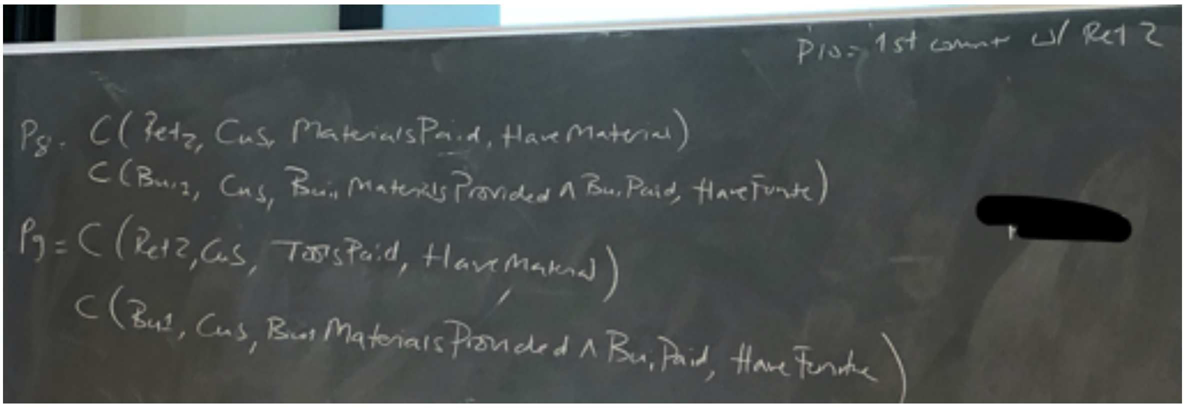


- (c) Suggest an alternative metric to social welfare to evaluate how good a state is.
    - i.e "how many opencommitmens there are"
    - I.e "only look at cost/benefit of the state to compare with the other state"
    - I.e look at minimums and maximums

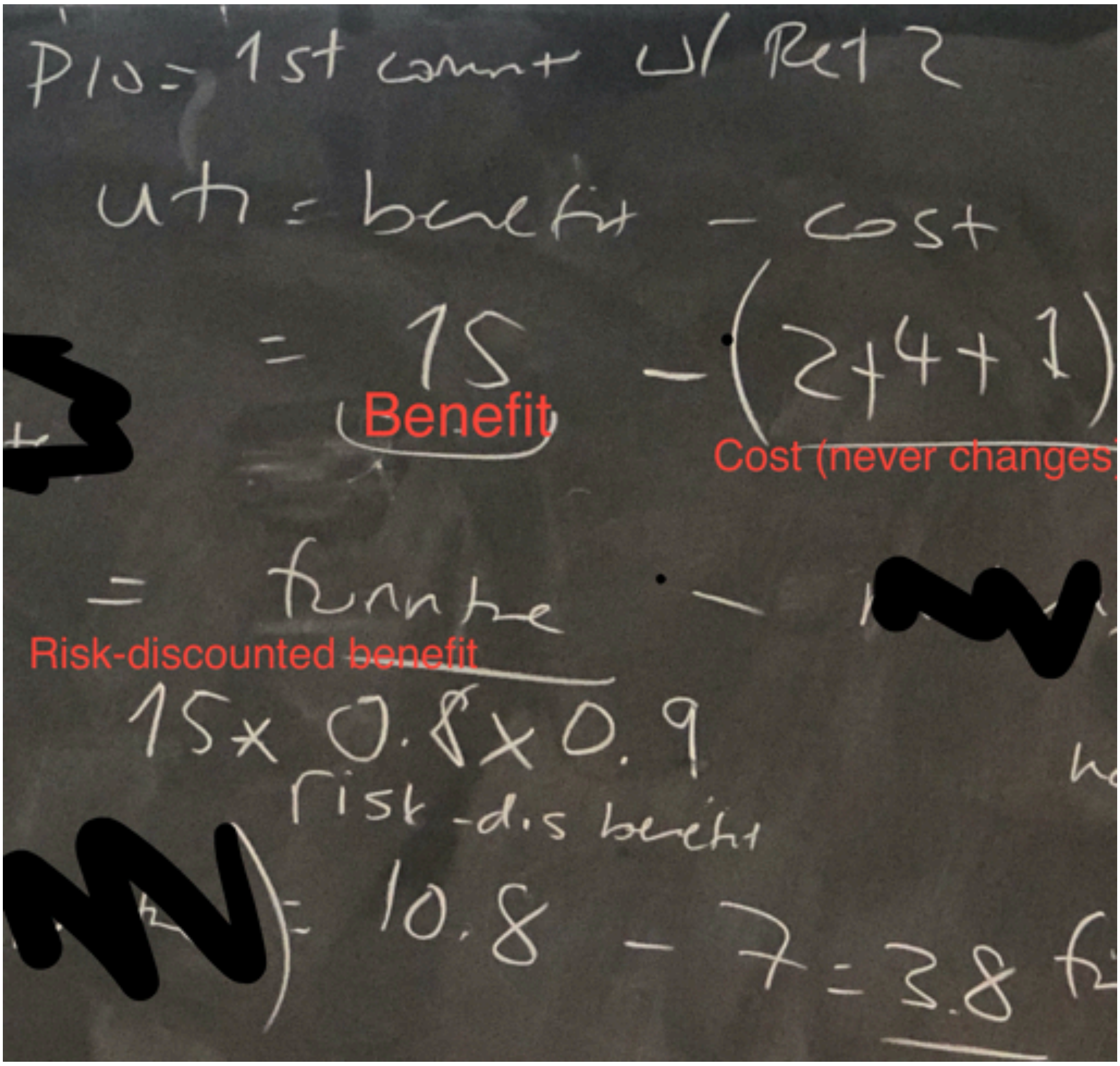
4. Consider the furniture building example we covered in class from (Gunay, Winikoff, Yolum) paper. Assume that the customer beliefs that there is a second Retailer, who can sell materials but not tools Scus(ret, ⊤, HaveMaterials) and the customer's trust in this service is 0.9.



- (a) Show which additional protocols would be generated by the customer.
  - We’ll have (except P1) double set of protocols where we replace Ret1 with Ret2 in cases where we HaveMaterials



- (b) Calculate the overall utility for added protocol(s), considering risk-discounted benefit.



5. Consider a multiagent system with six agents A1 . . . A5. A1 has a query vector of [0.4, 0.8, 0.9] and asks this query to A2 and A3. A2 has an expertise of [0.5, 0.9, 0.9] and models A4 as having an expertise of [0.2, 0.8, 0.7]. A3 has an expertise of [0.5, 0.2, 0.1], models A4 as having an expertise of [0.9, 0.9, 0.9] and models A5 as having an expertise of [0.2, 0.2, 0.4].

- (a) When A2 and A3 receive the query, would they answer it? If not, would they refer A4 or A5? Are there any parameters set to make these decisions? If so, what are they?
- (b) Assume that A3 gives a refferal to A4 and A1 asks the question to A4, which returns an answer that can be captured as [0.1, 0.1, 0.1]. What does this say to A1 about the expertise and sociability of the agents involved in the interaction?
- (c) Would the result be different if the referral to A4 was given by A2 rather than A3?