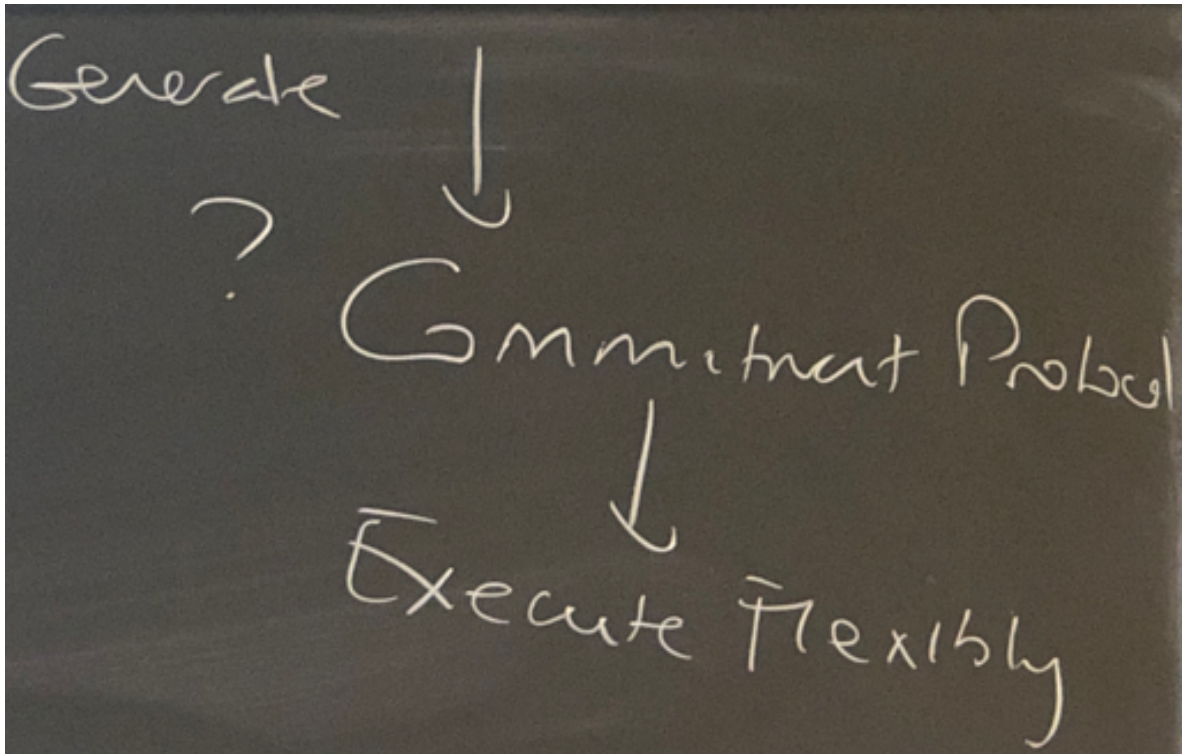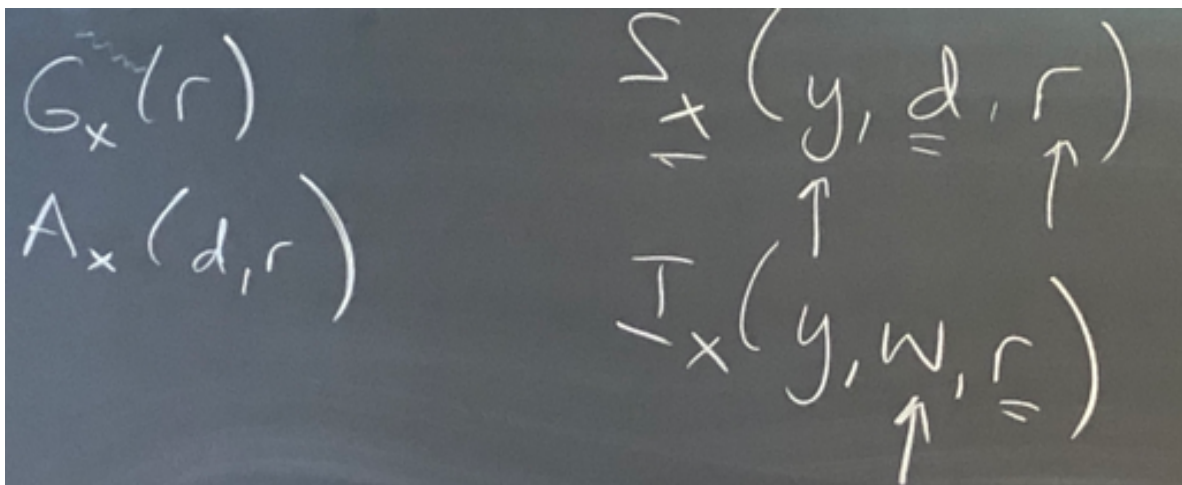# L11 Dynamically generated commitment protocols

Goal - agent 'x' wants 'r' to be true in the world
Ability - agent 'x' is able to bring about 'r' if 'd' is true
Belief (service) - agent 'x' believes that 'y' can do 'r' if 'd' is true (does not have to be correct as it's a belief, right ;))
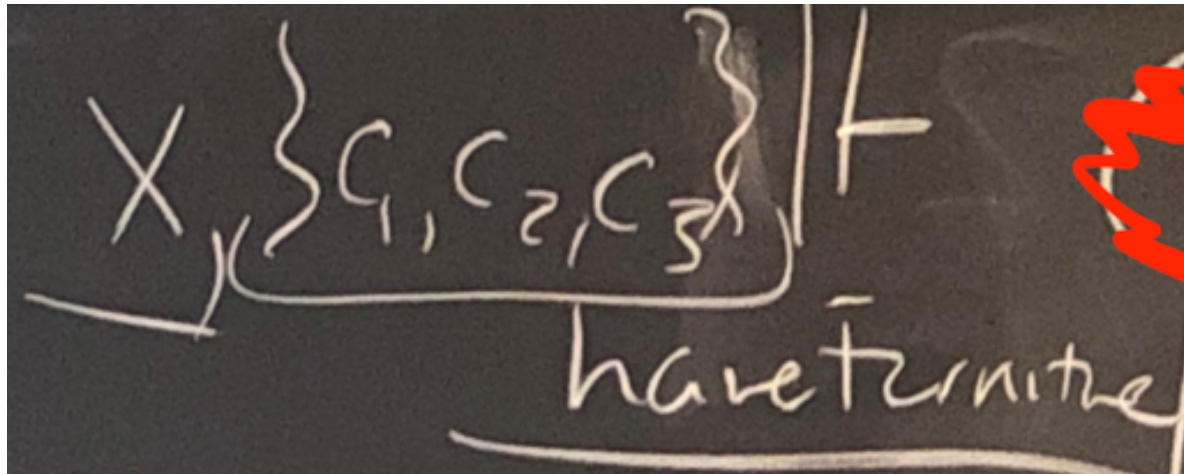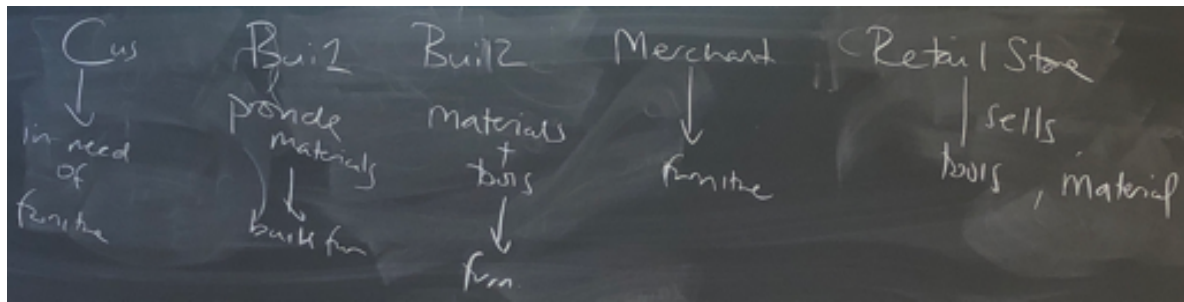Belief (incentive) - agent 'x' believes that 'y' has an incentive 'w' to do 'r'
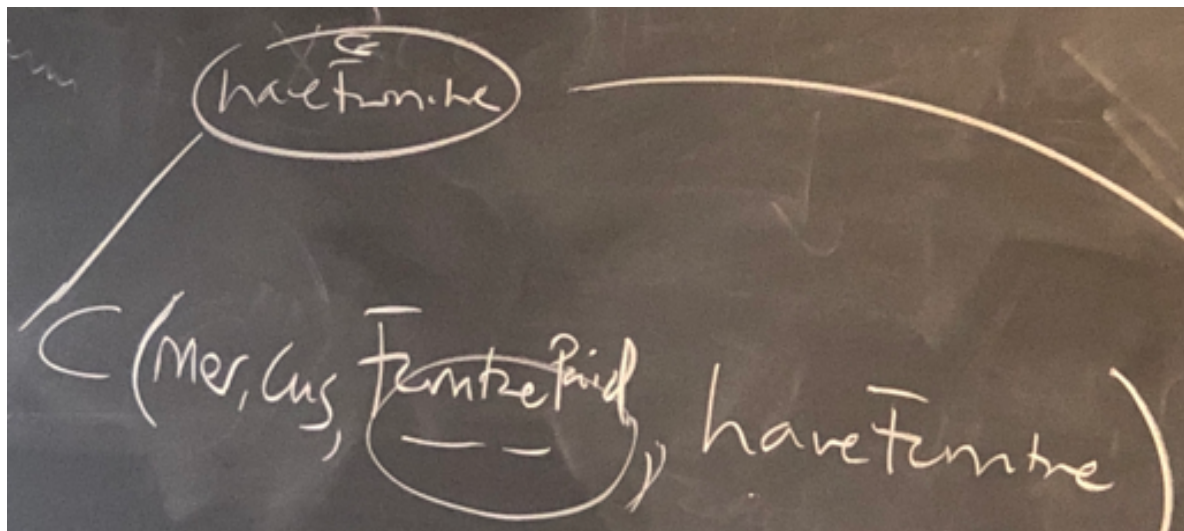

x can support d' (d-prime) with commitments 'C'
(x has certain goals, abilities beliefs to work towards the commitments)

Running example from the slides:

Protocol generation example (1):
'Cus' has a belief 'n1' and will generate a commitment 'C' to achieve goal 'haveFurniture'.

Protocol generation example (2):
'Cus' has a belief 's4' and will generate a commitment 'C' to achieve goal 'haveFurniture'. The second commitment 'C' is for achieving the goal 'haveMaterials' to satisfy the first commitment

1) C (Built, Cus, Bui Materials Provided ∧ Materials Paid, Have Furniture)

(Add Have Materials as a goal)

2) C (Ret, Cus Materials Paid, Have Materials)

There are seven protocols generated in the slides where not all will provide you with the valid resolution 'haveFurniture'. This is because of the high dependancy on the beliefs.

Ranking

Calculating benefit and cost (p5 from the slides)

Q: how can we generate commitments if the agent does not have beliefs? We need to have the beliefs to create any commitments.

Discounted utility calculation based on p4 from the slides:

$$\text{utility} = \underbrace{\text{benefit}}_{\text{benefit} \times T} - \text{cost} \quad \text{(all the propositions)}$$

Calculating discounted benefit (p4):

nefit for p₄ (relevant propositions
{ (HaveMaterials, HaveTools, HaveFurniture})

Service		Trust
s₁	S_{cap}(Ret, {}, HaveMaterials)	0.7
s₂	S_{cap}(Ret, {}, HaveTools)	0.6
s₃	S_{cap}(Mer, {}, HaveFurniture)	0.9
s₄	S_{cap}(Buy₁, Buy₁ MaterialsProvided, HaveFurniture)	0.8
s₅	S_{cap}(Buy₂, Buy₂ MaterialsProvided ∧ ToolsProvided, HaveFurniture)	0.2

HaveFurniture 15   Cost 12   P₄   C(Ret, Cus, MaterialsPaid ∧ HaveMaterial) (0)

$T_c(\text{mer}, \longrightarrow)$ ⟍↓   C(Ret, Cus, ToolsPaid, HaveTools)(€)

0.9 × 15 = 13.5   G(Buiz Cus, Buiz MaterialsProvided ∧

utility 15 $\dfrac{3}{}$ ToolsProvided ∧ Buiz Paid, HaveFurniture)

(15)