Session 6: Planning + Logic

1. *Strips*: Simulate the STRIPS approach to find a plan for the following blocks world problem.

Initial situation:	Final situation:
on(A,Table)	on(A,Table)
on(B,Table)	on(B,A)
on(C,Table)	on(C,B)
on(D,Table)	on(D,C)
clear(A)	clear(D)
clear(B)	
clear(C)	
clear(D)	

   Clearly indicate which operators establish or threaten which conditions. Show the resulting "before" relation and make sure that there are no loops.

2. *Strips*: Buying milk (Ex-exam). Simulate the STRIPS strategy to find a plan for this shopping problem. You are at home where you have some money but don't have any milk. You want to go to the store to buy some milk and return home.

Initial situation:	Final situation:
at(home)	have(milk)
	at(home)

You can use the following operators:

if	at(home)		if	at(home)
add	have(money)		add	at(shop)
delete			delete	at(home)
if	at(shop)		if	at(shop)
	paid		add	have(milk)
add	at(home)		delete	
delete	at(shop)			
if	at(shop)			
	have(money)			
	have(milk)			
add	paid			
delete	have(money)			

Indicate the order in which you add operators, every establishing and every threat. Consider the initial and final situation as two extra operators. Try to establish conditions by using the operators you already introduced before adding new operators. What are the possible linearisations?

3. Give the first-order logic representation of these sentences. Use a (self-defined) consistent alphabet.

   (a) Not all students take both history and biology.

   (b) No person likes a smart vegetarian.

   (c) There is a woman who likes all men who are not vegetarians.

   (d) The best score in history was better than the best score in biology.

   (e) Every person who dislikes all vegetarians is smart.

   (f) There is a barber who shaves all men in town who do not shave themselves.

   (g) No person likes a professor unless the professor is smart.

   (h) Only one student failed both history and biology.

   (i) Politicians can fool some of the people all the time, and they can fool all of the people some of the time, but they can't fool all of the people all of the time.

4. The following english sentences use 'and', 'or', and 'if' in a way that differs from first order logic. What are the intended logical connectives in these sentences ?

   (a) One more outburst like that and you'll be in contempt of court.

   (b) Either the Red Sox win or I'm out ten dollars.

   (c) Maybe I'll come to the party and maybe I won't.

5. Think about the truth value of these sentences.

   (a) I don't jump off the Empire State Building implies if I jump off the Empire State Building then I float safely to the ground.

   (b) It is not the case that if you attempt this exercise you will get an F. Therefore, you will attempt this exercise.