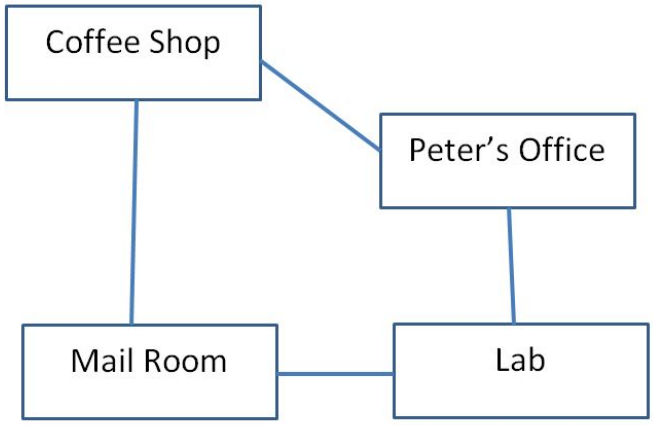
CIS604: Techniques in Artificial Intelligence
Exercise5, Fall 2013

Graph planning

A) Assume a robot system to deliver with mail and coffee. A simplified domain is as shown in figure.



Features to describe states

- RLoc- AR's location
- RHC - AR has coffee
- PWC - Peter wants coffee
- MW- Mail is waiting
- RHM- AR has mail

Actions

- mc- move clockwise
- mcc- move counterclockwise
- puc- pickup coffee
- dc- deliver coffee
- pum- pickup mail
- dm - deliver mail

The robot AR(Automatic Robot), can buy coffee at the coffee shop, pick up mail in the mail room, move, and deliver coffee and/or mail. Delivering the coffee to Peter's office will stop Peter from wanting coffee. There can be mail waiting at the mail room to be delivered to Peter's office.
1) Describe the state of the problem given above.
2) What are the possible actions?
3) Represent the state where AR is at the Lab, does not have coffee, Peter wants coffee, there is no mail waiting, and AR has mail.
4) Represent the state where AR is at the Lab, carrying coffee, Peter wants coffee, there is mail waiting, and AR is not holding any mail.
5) Complete the following table by writing the resulting state

State	Action	Resulting State
(lab, ¬rhc, pwc, ¬mw, rhm)	*mc*	
(lab, ¬rhc, pwc, ¬mw, rhm)	*mcc*	
(off, ¬rhc, pwc, ¬mw, rhm)	*dm*	
(off, ¬rhc, pwc, ¬mw, rhm)	*mcc*	
(off, ¬rhc, pwc, ¬mw, rhm)	*mc*	

B) Consider a scenario where you want to get from Apartment to Hospital for medical checkup during a public bus strike. You can either drive (if you have a car) or Ambulance (if you don't have car).
1) Specify the following

- relevant variables
- precondition
- actions
- effects

2) If we select the action goByAmbulance, what is the value of haveAmbulance after the action has been carried out?
3) If we are at Hospital and and select the action goByCar, what will the value of loc be after the action has been carried out?