ECON322 Game Theory

Half II Problem Set 4

UNIVERSITY OF LIVERPOOL

Question 1

Alice and Bob, use the following procedure to allocate two desirable identical indivisible objects. Alice proposes an allocation (both objects go to Alice, both objects go to Bob, one goes to each of them), which Bob then either accepts or rejects. In the event of rejection, neither of them receives either object. Each agent cares only about the number of objects he obtains.

(a) Model the story as a dynamic game between *Alice* and *Bob* in extensive-form.

(b) Give the number of strategies of *Alice* and *Bob*, respectively.

(c) Give the number of plans of *Alice* and *Bob*, respectively.

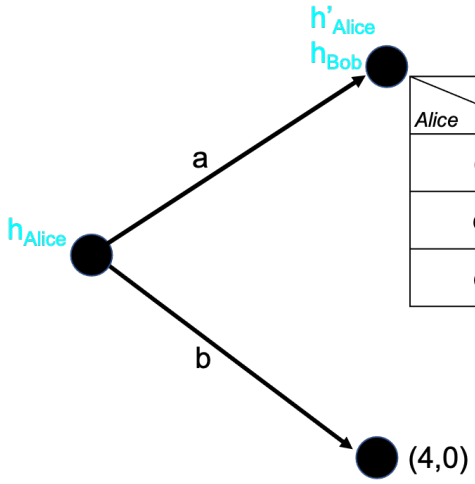
(d) Give the normal-form representation of the dynamic game.

(e) Give the strategies that *Alice* and *Bob* can rationally choose under common belief in rationality, respectively.

(f) Solve the game by backward induction.

Question 2

Consider the following dynamic game.



Alice \ Bob	f	g	h
c	(2,3)	(5,1)	(2,0)
d	(3,1)	(2,3)	(2,0)
e	(1,4)	(1,3)	(6,0)

(a) Give the number of strategies of *Alice* and *Bob*, respectively.

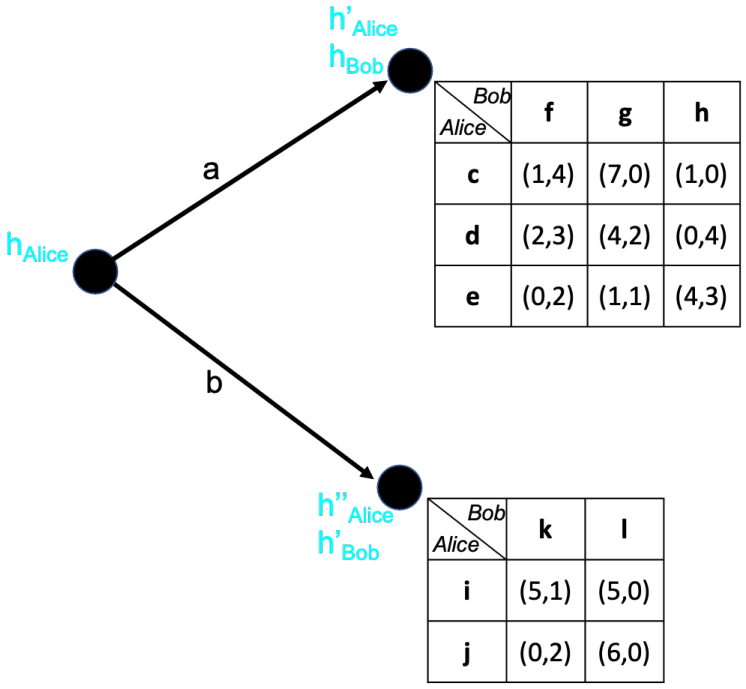
(b) Give the number of plans of *Alice* and *Bob*, respectively.

(c) Solve the game by backward dominance.

(d) Solve the game by forward induction.

Question 3

Consider the following dynamic game.



Alice \ Bob	f	g	h
c	(1,4)	(7,0)	(1,0)
d	(2,3)	(4,2)	(0,4)
e	(0,2)	(1,1)	(4,3)

Alice \ Bob	k	l
i	(5,1)	(5,0)
j	(0,2)	(6,0)

(a) Give the number of strategies of *Alice* and *Bob*, respectively.

(b) Give the number of plans of *Alice* and *Bob*, respectively.

(c) Solve the game by backward dominance.

(d) Solve the game by forward induction.