Answers to Problem Set 4: Dynamic Game Theory

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1. Bayes Law

Let E be the evidence and let H be the event that the husband did it.

pr(H)=.8; pr(E|H)=.8; pr(E|~H)=.15

apply Bayes law

$$pr(H|E) = \frac{pr(E|H)pr(H)}{pr(E)} = \frac{pr(E|H)pr(H)}{pr(E|H)pr(H) + pr(E|\sim H)pr(\sim H)}$$

$$= \frac{.8\times.8}{.8\times.8+.15\times.20} = .96$$

so a 96% chance the husband did it. In the second case

$$pr(H|E) = \frac{.8\times.8}{.8\times.8+.05\times.20} = .98$$

2. Mixed Strategy Equilibrium

a) D and R are strictly dominant strategies, so this is the only Nash equilibrium.

b)

	L	R
U	3*,2*	0,0
D	0,0	2*,3*

Two pure equilibria as marked. To the symmetric mixed equilibrium let p be the probability L. Then for player 1 to be indifferent, player 2 must mix according to $3p = 2(1-p)$ giving p=2/5 chance of Land a 3/5 chance of R. For player 2 to be indifferent let q be the chance of D ; we find that q=2/5 as well.

c)

	L	R
U	4*,2	3,5*
D	2,4*	4*,2

1. No pure equilibrium. To find the mixed equilibrium, again, let *p* be probability of L and q be the probability of D. Then $4p+3(1-p)=2p+4(1-p)$ and $4q+2(1-q)=2q+5(1-q)$ so *p*=1/3 and *q*=3/5