Assessment guidelines SØK2012 H18

The grade is based on an overall assessment, so the points are only indicative.

1. (a) **Answer:** When 10 is the reference point, the price movement is considered as a change in gains:

$$v(2) - v(7) = 1 - 3.5 = -2.5.$$

   (b) **Answer:** When 17 is the reference point, the price movement is considered a change in losses:

$$v(-5) - v(0) = -10 - 0 = -10.$$

   (c) **Answer:** Benice.

   Since questions (a) and (b) were about size of loss, absolute values are also accepted.

2. (a) **Answer:** Your utility $U^0(\boldsymbol{u})$ of utility streams $\langle u_0, u_1, u_2, \ldots \rangle$ from the point of view of time 0 is:

$$U^0(\boldsymbol{u}) = u_0 + \delta u_1 + \delta^2 u_2 \ldots$$

$$\begin{aligned} U^0(A) &= 3 \\ U^0(B) &= \frac{1}{2}4 = 2 \\ U^0(C) &= \left(\frac{1}{2}\right)^2 7 = 1\frac{3}{4} \end{aligned}$$

   You therefore choose A.

   (b) **Answer:** Your utility $U^0(\boldsymbol{u})$ of utility streams $\langle u_0, u_1, u_2, \ldots \rangle$ from the point of view of t = 0 is:

$$U^0(\boldsymbol{u}) = u_0 + \beta\delta u_1 + \beta\delta^2 u_2 \ldots$$

At time 0, the utility of the alternatives are:

$$U^0(A) = 3$$
$$U^0(B) = \frac{1}{2} \times 1 \times 4 = 2$$
$$U^0(C) = \frac{1}{2} \times 1 \times 7 = 3\frac{1}{2}$$

You therefore drop A and plan to choose C.

At time 1, the utility of the alternatives are:

$$U^1(B) = 4$$
$$U^1(C) = \frac{1}{2} \times 1 \times 7 = 3\frac{1}{2}.$$

So you forego C and choose B.

(c) **Answer:** From the point of view of time 1, you know you will drop C, so from the point of view of time 0, your choices are between A and B, so you choose A.

3. (a) **Answer:** Let $Pr(T) = \frac{1}{10000} = 1 - Pr(\neg T)$, $Pr(H \mid T) = \frac{9}{10}$, and $Pr(H \mid \neg T) = \frac{1}{10}$. Then:

$$Pr(H\&T) = Pr(H \mid T) \times Pr(T) = \frac{9}{10} \times \frac{1}{10000} = 0.00009.$$

(b) **Answer:**

$$Pr(H\&\neg T) = Pr(H \mid \neg T) \times Pr(\neg T) = \frac{1}{10} \times \frac{9999}{10000} = 0.09999.$$

(c) **Answer:** By the rule of total probability:

$$\begin{aligned} Pr(H) &= Pr(H\&T) + Pr(H\&\neg T) \\ &= \frac{9}{10} \times \frac{1}{10000} + \frac{1}{10} \times \frac{9999}{10000} \\ &= \frac{10008}{100000} = 0.00009 + 0.09999 = 0.10008. \end{aligned}$$

(d) **Answer:** By Bayes rule:

$$\begin{aligned} Pr(T \mid H) &= \frac{Pr(H \mid T) \times Pr(T)}{Pr(H)} \\ &= \frac{0.00009}{0.10008} \approx 0.0009. \end{aligned}$$

(e) **Answer:** Base rate neglect.

4. (a) i. **Answer:** A Nash equilibrium is found as the strategy profile such that each strategy in the profile is a best response to the other strategies in the profile. Here that will be $\langle U, L \rangle$ and $\langle D, R \rangle$.

ii. **Answer:** Let the probability that Player 1 plays U be $p = Pr(U) = 1 - Pr(D)$. The probability depends upon the mixed strategy of Player 2. This must be where Player 2 is indifferent between L and R in terms of expected payoffs:

$$\begin{aligned} Eu(L) &= Eu(R) \\ 2 \times p + 0 \times (1-p) &= 1 \times p + 1 \times (1-p) \\ 2 \times p &= 1 \\ p &= \frac{1}{2}. \end{aligned}$$

Answer: Let the probability that Player 2 plays L be $q = Pr(L) = 1 - Pr(R)$. The probability depends upon the mixed strategy of Player 1. This must be where Player 1 is indifferent between U and D in terms of expected payoffs:

$$\begin{aligned} Eu(U) &= Eu(D) \\ 3 \times q + 0 \times (1-q) &= 1 \times q + 2 \times (1-q) \\ 3 \times q &= 2 - q \\ q &= \frac{1}{2}. \end{aligned}$$

Answer: Since the probabilities are assumed to be independent, the expected payoff for Player 1 is:

$$Eu_1 = \frac{1}{2} \times \frac{1}{2} (3 + 0 + 1 + 2) = \frac{6}{4} = 1.5.$$

Answer: Since the probabilities are assumed to be independent, the expected payoff for Player 2 is:

$$Eu_2 = \frac{1}{2} \times \frac{1}{2} (2 + 1 + 0 + 1) = 1.$$

(b) i. **Answer:** There are two Nash equilibria $\langle U, L\rangle$ and $\langle D, R\rangle$.

5. **Answer:** (From the lectures & book:) Libertarian paternalism is the thesis that it is legitimate to help people make better decisions themselves, by their own lights, if it is possible to do so without interfering with their liberty or autonomy. It is "Paternalistic" because it aims to make people better off. It is 'Libertarian" because it tries to do so in a manner that respects their liberty and autonomy, so it eschews dictatorial solutions.

   A nudge aims to help people (the "targets") make better decisions themselves – not make decisions for them. It imposes trivial costs on the targets. It has trivial effects on targets who are already rational and well-informed. It has a non-trivial beneficial effect on targets who are not already rational and well-informed – as defined by their own standards.

   A very good answer will also include examples and critique.