22-S1-Q5

Q: (a) (i) pessimism

Solution Maximin $-5 > -10 > -20 > -30$

Mr. chen should invest Condominium (C)

(ii) optimism

Solution Maximax $30 > 25 > 20 > 15$

Mr. chen should invest shop (S)

(iii) regret

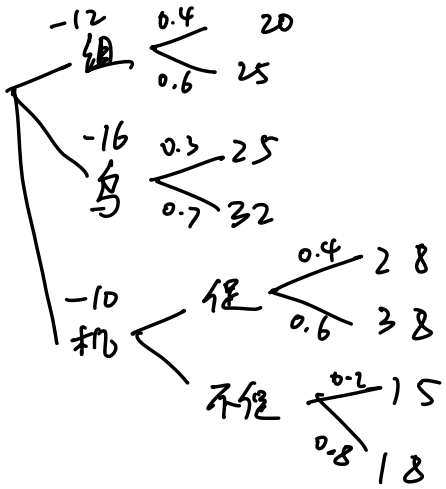
	E1	E2	E3	r_{ij}
I	-10	10	20	$-5 - r_{i1}$
O	-20	12	25	$15 - r_{i2}$
S	-30	15	30	$30 - r_{i3}$
C	-5	10	15	
Max	-5	15	30	

	E1	E2	E3		
I	~~-10~~ 5	~~10~~ 5	~~20~~ 10	(10)	minimax regret
O	~~-20~~ 15	~~12~~ 3	~~25~~ 5	15	
S	~~-30~~ 25	~~15~~ 0	~~30~~ 0	25	
C	~~-5~~ 0	~~10~~ 5	~~15~~ 15	15	
Max	-5	15	30		

So, Mr. chen should invest Industrial (I)

(b) Q

(i)



$u(x) = \sqrt{\max[x+2, 0]}/21$

x : profit in unit 1K

Solution

$$X_{HDB} = (0.4 \times 20 + 0.6 \times 25) - 12 = 11$$

$$X_{Drc} = (0.3 \times 25 + 0.7 \times 32) - 16 = 13.9$$

$$X_{Air\text{-}p} = (0.4 \times 28 + 0.6 \times 38) - 10 = 23.6$$

$$X_{Air\text{-}No\text{-}p} = (0.2 \times 15 + 0.8 \times 18) - 10 = 7.4$$

$$u(X_{HDB}) = \sqrt{\frac{11+2}{12}} = \frac{\sqrt{39}}{6} = 1.040833$$

$$u(X_{Drc}) = \sqrt{\frac{13.9+2}{12}} = \frac{\sqrt{530}}{20} = 1.1511$$

$$u(X_{Air\text{-}p}) = \sqrt{\frac{23.6+2}{12}} = \frac{4\sqrt{30}}{15} = 1.4606$$ highest ✓

$$u(X_{Air\text{-}No\text{-}p}) = \sqrt{\frac{7.4+2}{12}} = \frac{\sqrt{705}}{30} = 0.8851$$

So, the best outlet location is the airport and join the airport promotion

(ii) Since $u(X_{Air-No-p}) < u(X_{HDB}) < u(X_{Orc})$

when $u(X_{Air-p}) < u(X_{Orc})$, it will change the (i) answer

$$\sqrt{\frac{23.6+2-y}{12}} < \frac{\sqrt{530}}{20}$$

$$\frac{25.6-y}{12} < \frac{530}{400}$$

$$25.6 < y + 15.9$$

$$y > 9.7$$