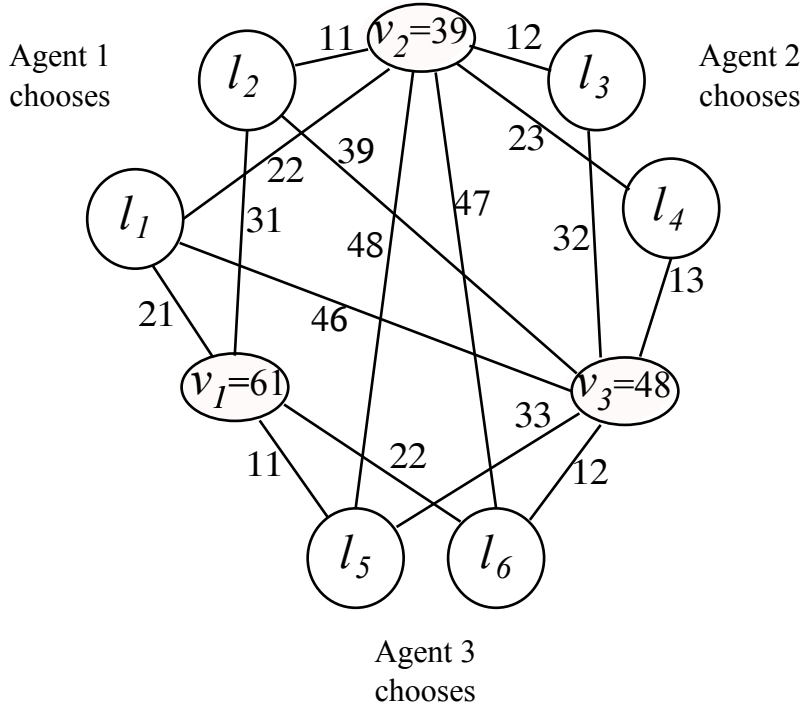
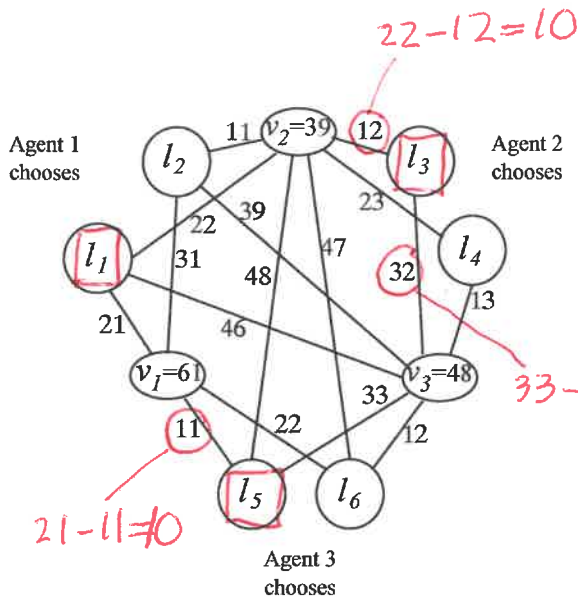


## CSE 5319/6319 Homework 2

4. Determine the PNE and OPT status for the eight possible agent choice situations for the following instance of the location game (55 points):



| Agent Choices with Payoffs $\pi_i(\mathbf{s})$ |           |           | $W(\mathbf{s})$ | $\sum_{i=1}^k \pi_i(\mathbf{s})$ |          |
|--|-----------|-----------|-----------------|----------------------------------|----------|
| $l_1(0)$                                       | $l_3(11)$ | $l_5(10)$ | 93              | 21                               |          |
| $l_1(1)$                                       | $l_3(10)$ | $l_6(20)$ | 103             | 31                               | PNE      |
| $l_1(1)$                                       | $l_4(20)$ | $l_5(10)$ | 102             | 31                               |          |
| $l_1(2)$                                       | $l_4(0)$  | $l_6(1)$  | 93              | 3                                |          |
| $l_2(1)$                                       | $l_3(1)$  | $l_5(20)$ | 94              | 22                               |          |
| $l_2(1)$                                       | $l_3(0)$  | $l_6(29)$ | 103             | 30                               | PNE      |
| $l_2(12)$                                      | $l_4(20)$ | $l_5(20)$ | 113             | 52                               | PNE, OPT |
| $l_2(12)$                                      | $l_4(0)$  | $l_6(10)$ | 103             | 22                               |          |

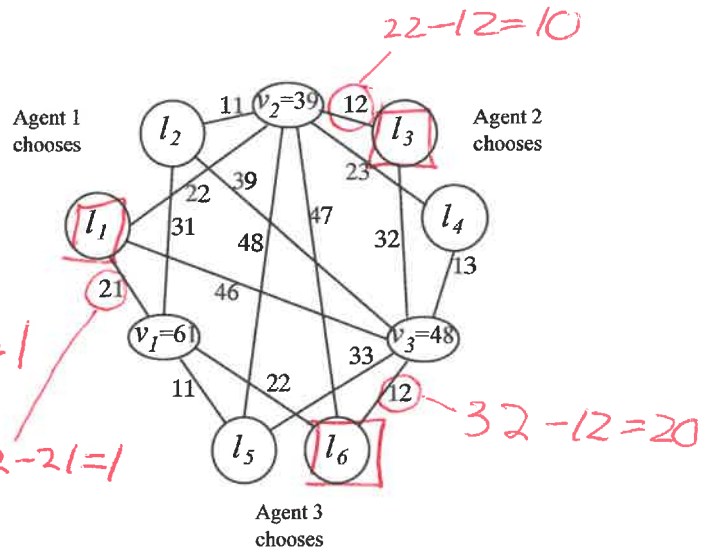


$\Sigma \text{ payoff} = 21$

$$W = (61-11) + (39-12) + (48-32)$$

$$= 50 + 27 + 16$$

$$= 93$$

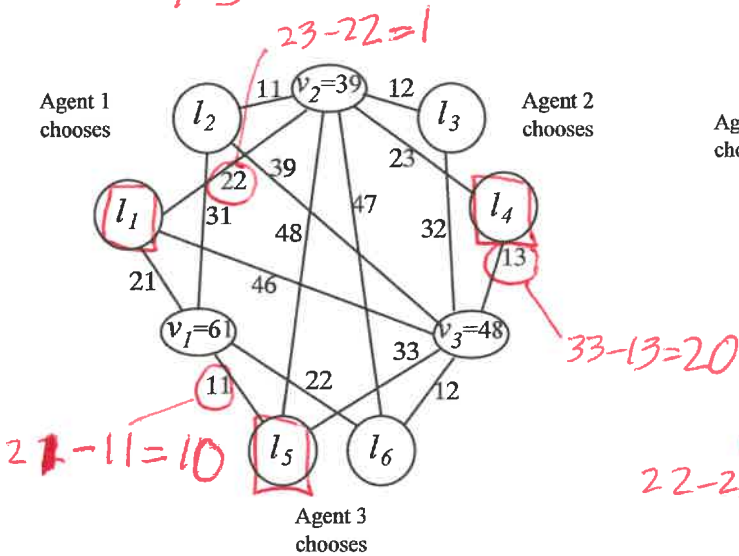


$\Sigma \text{ payoff} = 31$

$$W = (61-21) + (39-12) + (48-12)$$

$$= 40 + 27 + 36$$

$$= 103$$

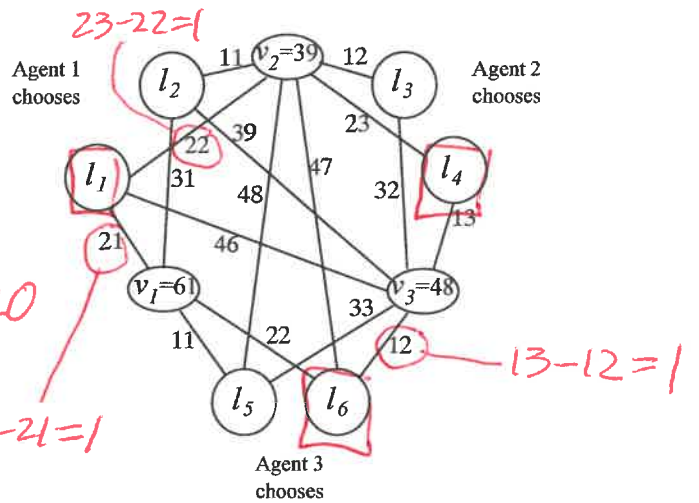


$\Sigma \text{ payoff} = 31$

$$W = (61-11) + (39-22) + (48-13)$$

$$= 50 + 17 + 35$$

$$= 102$$

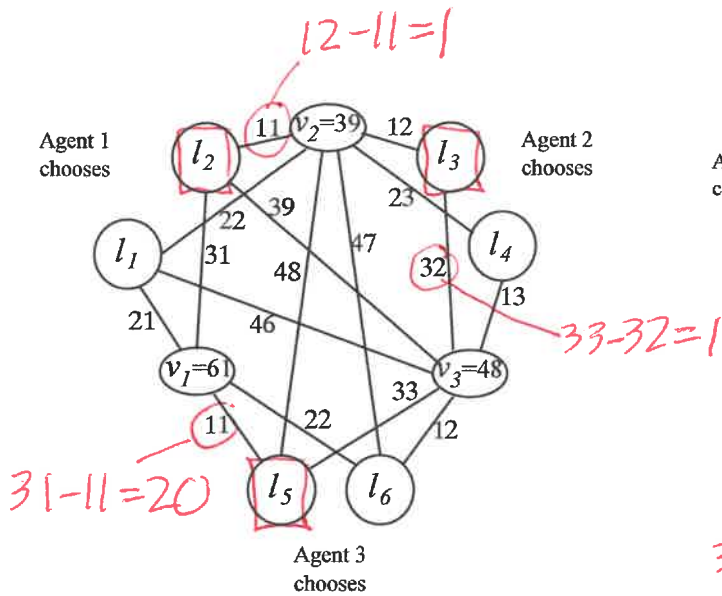


$\Sigma \text{ payoff} = 3$

$$W = (61-21) + (39-22) + (48-12)$$

$$= 40 + 17 + 36$$

$$= 93$$

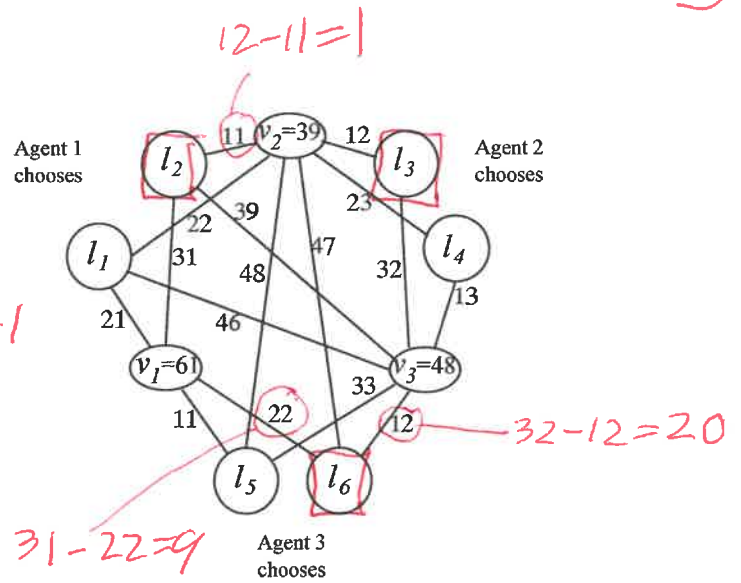


$\Sigma \text{ payoff} = 22$

$$W = (61-11) + (39-11) + (48-32)$$

$$= 50 + 28 + 16$$

$$= 94$$

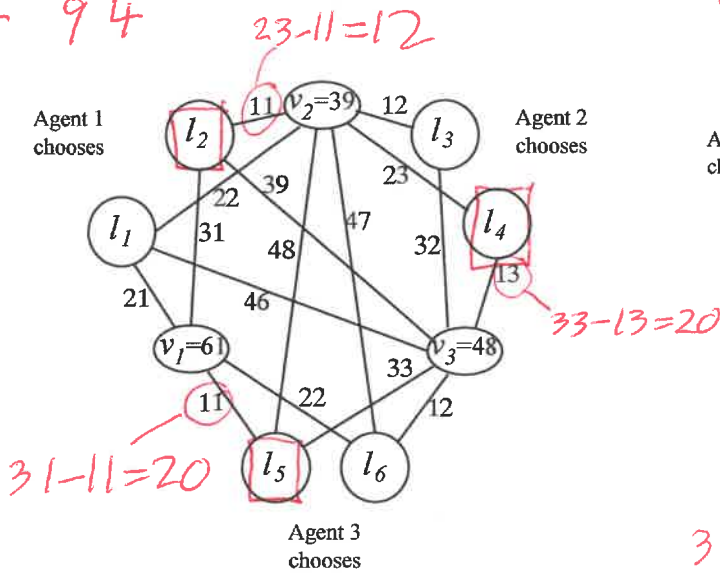


$\Sigma \text{ payoff} = 30$

$$W = (61-22) + (39-11) + (48-12)$$

$$= 39 + 28 + 36$$

$$= ~~83~~ 103$$

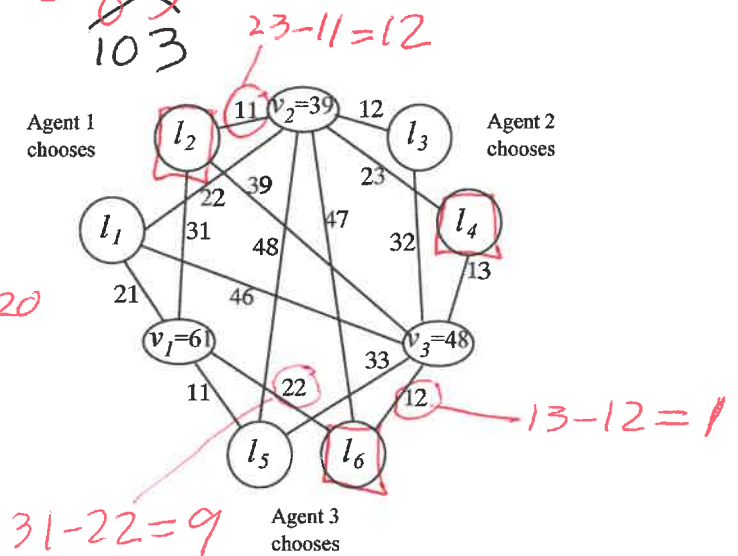


$\Sigma \text{ payoff} = 52$

$$W = (61-11) + (39-11) + (48-13)$$

$$= 50 + 28 + 35$$

$$= 113$$



$\Sigma \text{ payoff} = 22$

$$W = (61-22) + (39-11) + (48-12)$$

$$= 39 + 28 + 36$$

$$= 103$$

