

(a) Must this game have a Nash equilibrium? Explain your answer.

$$u_2 = 3u_1 \quad u_3 = u_1^2 \Rightarrow u_1 = \sqrt{u_3} \quad u_2 = 3\sqrt{u_3}$$

I'm trying to follow your solution because I don't understand.

Because u_2 and u_3 are quantities of u_1 , they always try to maximize u_1 . This means that V_1 is always an NE

(b) Must this game have an efficient Nash equilibrium? Explain your answer.

It is efficient because of reasons stated in Part A

(c) Suppose that in addition to the information given above, you know that s^* is a Nash equilibrium of the game. Must s^* be an efficient strategy profile? Explain your answer; if you answer “no,” then provide a counterexample.

There could be an inefficient, non-strict NE because conditions don't dictate only having a strict NE

A $\swarrow \searrow$ B

	L	R
U	1, 3, 1	0, 0, 0
D	0, 0, 0	0, 0, 0

	L	R
U	3, 9, 9	0, 0, 0
D	0, 0, 0	0, 0, 0

$$u_1, u_2, u_3$$

ALU and BLU are both NE, but ALU is inefficient