

16. We do two point cross over after 5th bit and 8th bit
DON'T CHANGE | CHANGE | DON'T CHANGE
If don't change the first part, we can change the middle part and don't change the last part
Also, the highlighted part in Yellow could have also been an answer

1 2 3 8 7 5 1 2 6 3

17. Same explanation as the Reversion Mutation

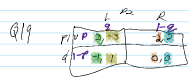
Options

1 8 1 5 X

1 3 7 5 X

1 3 7 8 1 5 2 9

18. There is NO Nash Equilibrium in this 2 player game



This formula can be found on GAME THEORY SLIDES in the Mixed Strategies Nash Equilibrium Part

$$P1 \text{ plays } P2: 3p + 0(1-p) = 3p + 1 - 1p$$

$$-4p + 1 = 2p$$

$$3p + 0(1-p) = 2p$$

$$1 + 4p = 6$$

$$p = \frac{5}{6}$$

In this part, we think about how player 1 wants to play in order to make it a mixed strategy
So if Player 1 plays UP, then we consider the left and right options as shown in blue in yellow
So player 1 will play up 1/6 of the time and down 5/6

We apply the same rules as we did before, for how player 2 will play
In this case he will play Left, so player 1 will play up and down (This will NOT be the answers we used for player 1)

So player 2 will play Left 1/3 and right 2/3

P2 plays Left

$$3p + 0(1-p) = 3p - 2 + 1p$$

$$-4p + 1 = 2p$$

$$4p - 2 = -2p$$

$$\frac{6p}{6} = \frac{2}{6} = \frac{1}{3}$$

Question 22

0.32 pts

Consider the following game. The mixed strategy of playing rock 1/3 of the time, paper 1/3 of the time, and scissors 1/3 of the time is a Nash equilibrium for the game.

		Player 2		
		Rock	Paper	Scissors
Player	Rock	0, 0	-1, 1	1, -1
	Paper	1, -1	0, 0	-1, 1
	Scissors	-1, 1	1, -1	0, 0

- ☒ True
☐ False

Mixed strategies with Nash Equilibrium will have the same amount of payoffs
As shown in blue highlight

Question 24

0.32 pts

Which one of the strategies below will yield a higher outcome in the long run against someone that plays the following strategy: rock 1/3 of the time, paper 1/3 of the time, and scissors 1/3 of the time?

		Player 2		
		Rock	Paper	Scissors
Player	Rock	0, 0	-1, 1	1, -1
	Paper	1, -1	0, 0	-1, 1
	Scissors	-1, 1	1, -1	0, 0

- ☒ All strategies will yield the same average outcome.
☐ Always play rock.
☐ Always play paper.
☐ Play rock 1/3 of the time, paper 1/3 of the time, and scissors 1/3 of the time.
☐ Always play scissors.

Question 25

0.32 pts

Consider the following coordination game called Stag Hunt:

- Two hunters go out to hunt meat.
- There are two hares in the range and one stag. The hunters can each bring the equipment necessary to catch one type of animal.
- The stag has more meat than the hares combined, but both players must choose to hunt the stag to catch it.
- Hare hunters can catch all of their prey by themselves.

The payoff matrix is given below:

		Hunter 2	
		Stag	Hare
Hunter 1	Stag	5, 5	0, 4
	Hare	4, 0	2, 2

I. How many Nash equilibria in pure strategies exist? 2

II. Does it have a Nash equilibrium in mixed strategies? y (yh)

Nash equilibrium in Mixed strategies will have the same payoffs in one box such as 5,5 and 2,2

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		Player 2	
		Left	Right
Player 1	Up	3, -2	-2, 1
	Down	-2, 1	1, 1

There is a Nash equilibrium in Pure Strategies (UP, LEFT)
There exist no Nash Equilibrium in Mixed Strategies

player 1 goes UP, its in the best interest for player 2 to go to the best payout for player 2) in this case Left

Player 1 goes down its in the best interest for player 2 to go to the best payout 4, which is the Left

Same logic is applied to player 1
So if player 2 plays Left, then it is in the best interest for player 1 to go to payout out 1 which is UP

We always want to play rock because we know that the other person will
Play ROCK 1/4=0.25
Play Paper 1/4=0.25
Play Scissors 2/4=0.50

Question 21

0.32 pts

Consider the game below. What is the best response against someone that plays the following strategy: rock 1/4 of the time, paper 1/4 of the time, and scissors 1/2 of the time?

		Player 2		
		Rock	Paper	Scissors
Player	Rock	0, 0	-1, 1	1, -1
	Paper	1, -1	0, 0	-1, 1
	Scissors	-1, 1	1, -1	0, 0

Knowledge Interactive: Introduction to Game Theory

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Quiz: Problem set 1

		Player 2		
		Rock	Paper	Scissors
Player	Rock	0, 0	-1, 1	1, -1
	Paper	1, -1	0, 0	-1, 1
	Scissors	-1, 1	1, -1	0, 0

- ☐ Play rock 1/3 of the time, paper 1/3 of the time, and scissors 1/3 of the time
☐ Always play scissors
☐ Always play paper
☒ Always play rock

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