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Prisoner's dilemma

Start ga values:

Size of chromosome	Size of population	Epoch	Mutation	Crossover	Selection
64	40	50	0.001	One point	Truncate

Start prisoner dilemma values:

	Player 1		
Player 2		Cooperate	Defect
	Cooperate	R=3, R = 3	S = 0, T = 5
	Defect	T = 5, S = 0	P = 1, P = 1

Where:
T – Temptation to defect
R – Reward for mutual cooperation
S – Sucker’s Payoff
P – Punishment for mutual defection
Condition T>R>P>S must hold.

Next 3 iteration represent 3 iteration with next pattern:
ITERATION - number of generation
Player 1 or 2 (player id) is whitch player has been played.
Binary represent his decision 1 is Cooperate and 0 is Defect (9 bit equel 9 games)
Result is how much score have been archived. It’s depend on “Start prisoner dilemma values”

ITERATION 0(start)

Player 1 (id: 33) Result = 22 101011010
Player 2 (id: 23) Result = 17 001001011

Player 1 (id: 27) Result = 13 100011000
Player 2 (id: 32) Result = 28 011111001

Player 1 (id: 31) Result = 21 010110001
Player 2 (id: 25) Result = 16 100000011

Player 1 (id: 35) Result = 17 000011010
Player 2 (id: 39) Result = 22 111100000

Player 1 (id: 24) Result = 16 100010001
Player 2 (id: 14) Result = 21 000011110

Player 1 (id: 25) Result = 15 000000111
Player 2 (id: 26) Result = 25 101101100

Player 1 (id: 21) Result = 13 110000001
Player 2 (id: 3) Result = 28 101001111

Player 1 (id: 31) Result = 16 101000101
Player 2 (id: 11) Result = 26 111100110

Player 1 (id: 20) Result = 25 101110110
Player 2 (id: 7) Result = 20 100101101

Player 1 (id: 10) Result = 29 011110011
Player 2 (id: 39) Result = 9 000100001

ITERATION 20 (middle)

Player 1 (id: 16) Result = 2 0 011101000
Player 2 (id: 19) Result = 20 101010001

Player 1 (id: 9) Result = 19 100010110
Player 2 (id: 5) Result = 19 111000010

Player 1 (id: 19) Result = 24 111100001
Player 2 (id: 21) Result = 14 110000100

Player 1 (id: 37) Result = 20 001100101
Player 2 (id: 4) Result = 15 011000100

Player 1 (id: 23) Result = 2 2 010011001
Player 2 (id: 32) Result = 12 000000101

Player 1 (id: 1) Result = 19 001101000
Player 2 (id: 16) Result = 14 100000001

Player 1 (id: 14) Result = 16 000010101
Player 2 (id: 37) Result = 16 001000101

Player 1 (id: 26) Result = 19 010011010
Player 2 (id: 6) Result = 24 111100100

Player 1 (id: 14) Result = 18 011011001
Player 2 (id: 29) Result = 28 110111101

Player 1 (id: 30) Result = 29 101101111
Player 2 (id: 18) Result = 19 010111100

ITERATION 40 (end)

Player 1 (id: 32) Result = 17 111010001
Player 2 (id: 28) Result = 27 111110011

Player 1 (id: 38) Result = 18 111000010
Player 2 (id: 39) Result = 23 100101110

Player 1 (id: 14) Result = 8 001010000
Player 2 (id: 15) Result = 38 111101111

Player 1 (id: 37) Result = 11 001000001
Player 2 (id: 31) Result = 21 001010011

Player 1 (id: 11) Result = 14 011010000
Player 2 (id: 14) Result = 24 111100100

Player 1 (id: 15) Result = 13 001001100
Player 2 (id: 7) Result = 28 110011110

Player 1 (id: 20) Result = 7 111011010
Player 2 (id: 2) Result = 32 000000100

Player 1 (id: 21) Result = 1 7 101110000
Player 2 (id: 28) Result = 30 111100111

Player 1 (id: 26) Result = 21 100011110
Player 2 (id: 23) Result = 21 000111101

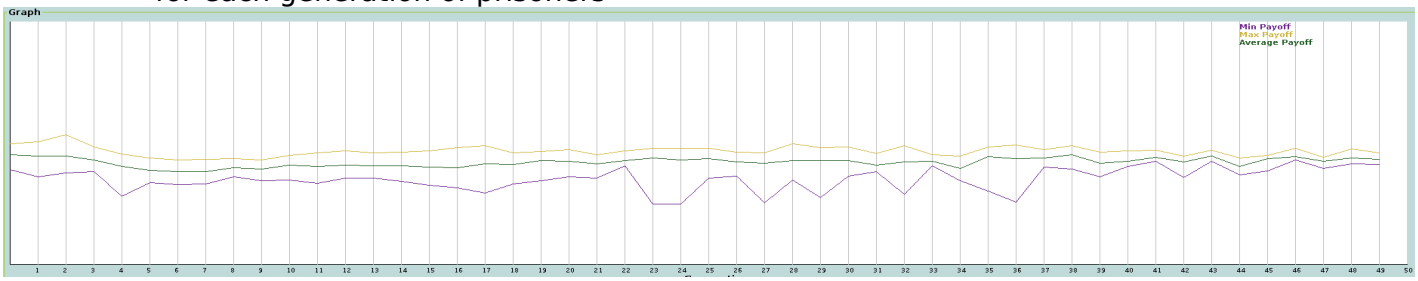
Player 1 (id: 5) Result = 26 110010001
Player 2 (id: 0) Result = 16 100110111

Used strategy is TFT:
CCDCDCDCDCDCDCDCDCDCDCDCDCDCDCDCDCDCDCDCDCDCDCDCDCDCDCDCDCDCDCDCD
CDCDCDCDCDCDCDCDCDCD

Where C is Cooperate and D is Defect

The best strategy is:
DCDDCDDCCDDCCDDDCCCCDDDDCDCDCDDCDCDCCDCDCCDDDDCDCCDDD
DCDDCCCCCDDDCCDDCC
Where C is Cooperate and D is Defect

Graph displaying a 2D line graph of minimum, maximum and average payoffs for each generation of prisoners



Min payoff: 7
Max payoff: 30
Ave payoff: 17

Conclusion: The completed work has accomplished its goals. The Prisoner's Dilemma problem has been examined and strategies to successfully play the game have been evolved. Above have been analysed and proven to display the characteristics necessary to play the Prisoner's Dilemma successfully.