

UNIVERSITÉ LIBRE DE BRUXELLES

INFO-F-409 - LEARNING DYNAMICS

## Assignment Two

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## Preliminary information

Each simulation was being executed 100 times. For the visualizations:

- Red signifies the action *cooperation*
- Blue signifies the action *defection*

Graphic displays one specific game, Graph shows information of all games

## 1 Part One - Spatial Prisoners Dilemma

### 1.1 Moore Neighborhood

### 1.1.1 4x4

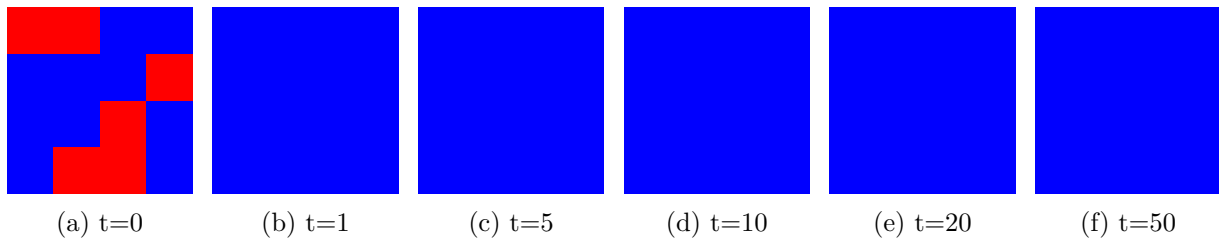
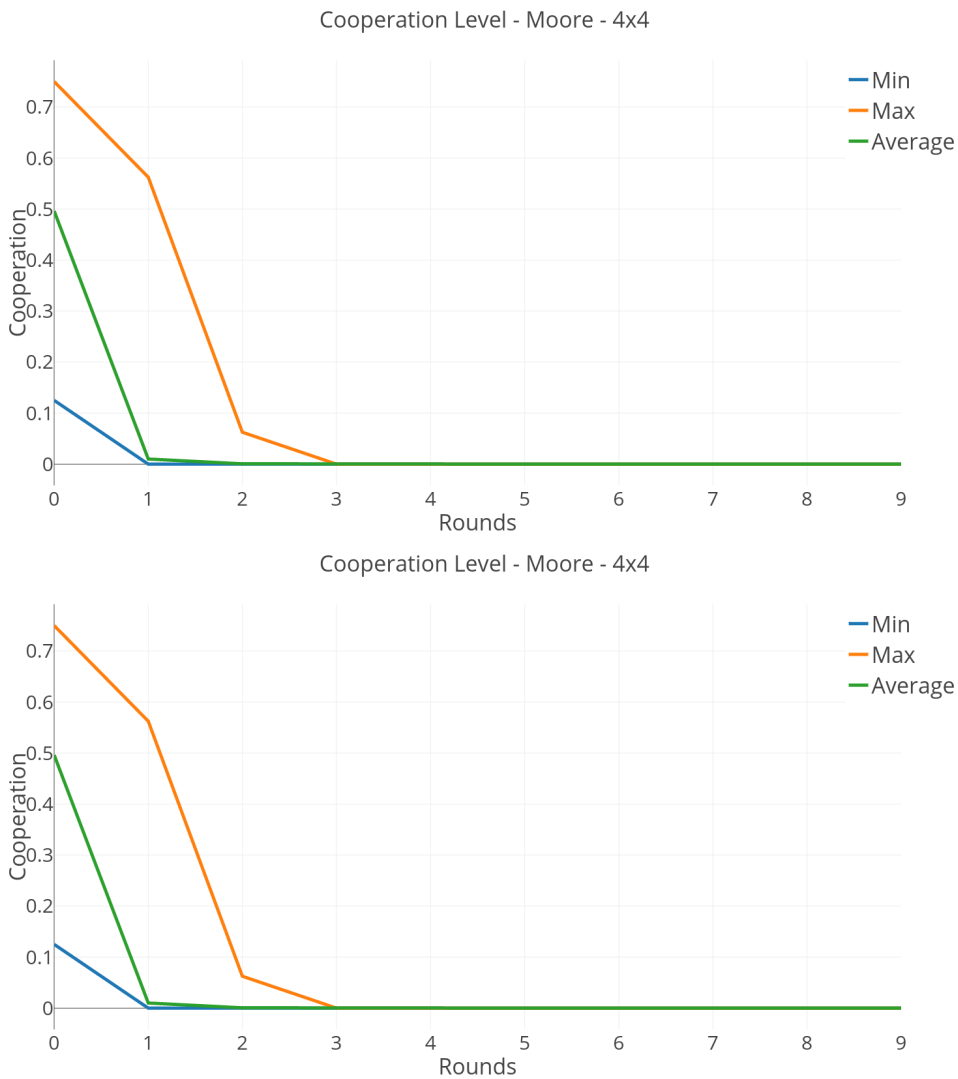


Figure 1: Prisoners Dilemma, Moore, 4x4



From simulating 100 runs we observe that all converge to *defecting*. It is however possible that it converges to a cooperative field, but it requires that we have a sub-matrix of 2x2 with only cooperators and all other players being defectors. This did obviously not happen during one of the simulations.

### 1.1.2 8x8

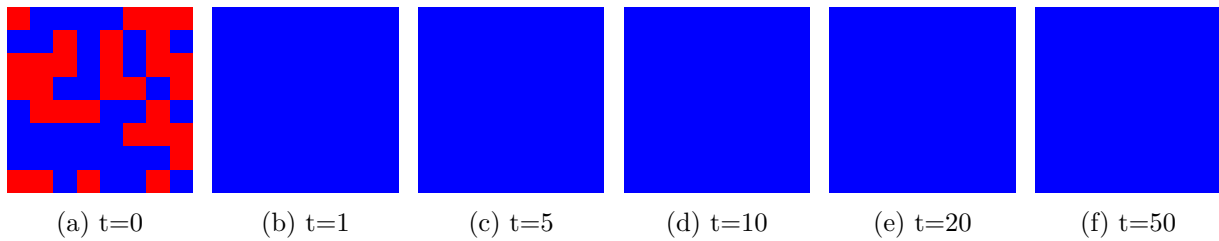
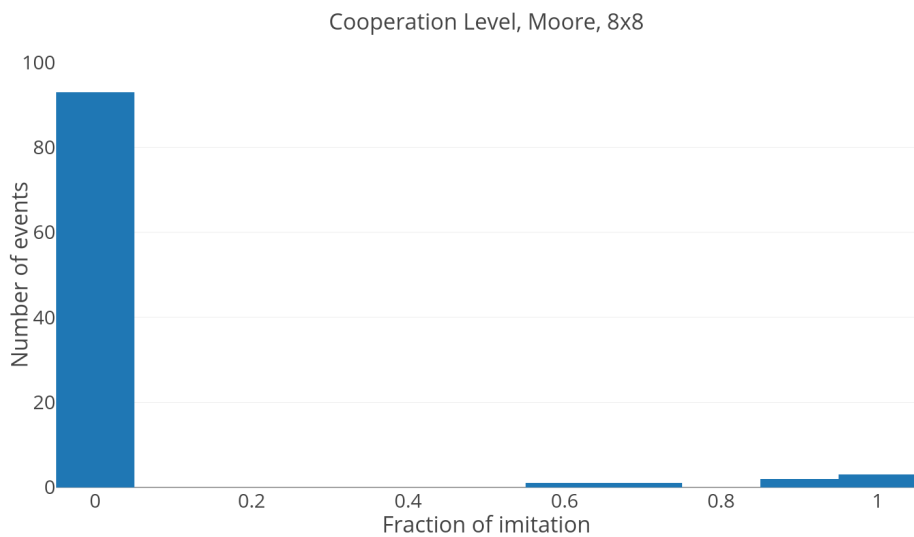
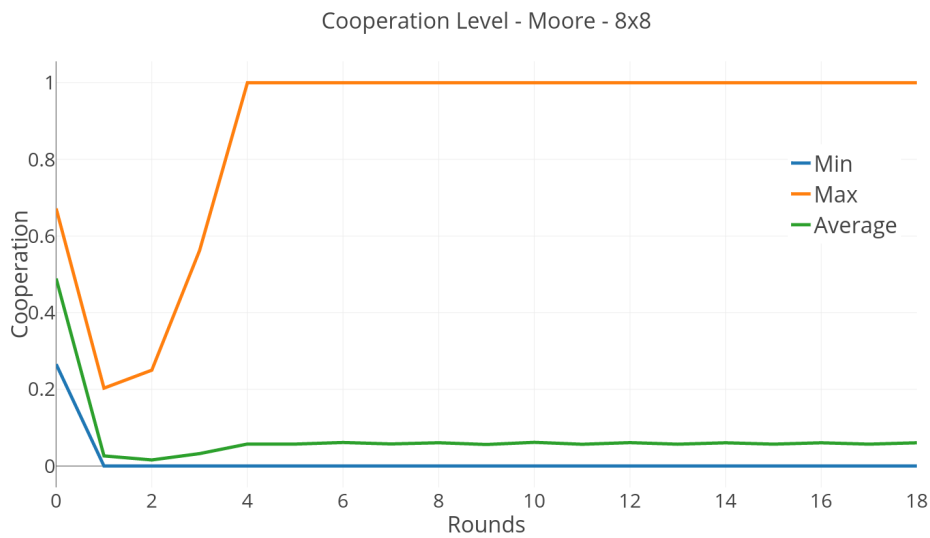


Figure 3: Prisoners Dilemma, Moore, 8x8



mean = 0.0605  
deviation = 0.2251

converge at 10, 20 rounds

From simulating 100 runs we observe that all converge to *defecting*. It is however possible that it converges to a cooperative field, but it requires that we have a sub-matrix of 2x2 with only cooperators and all other players being defectors. This did obviously not happen during one of the simulations.

### 1.1.3 12x12

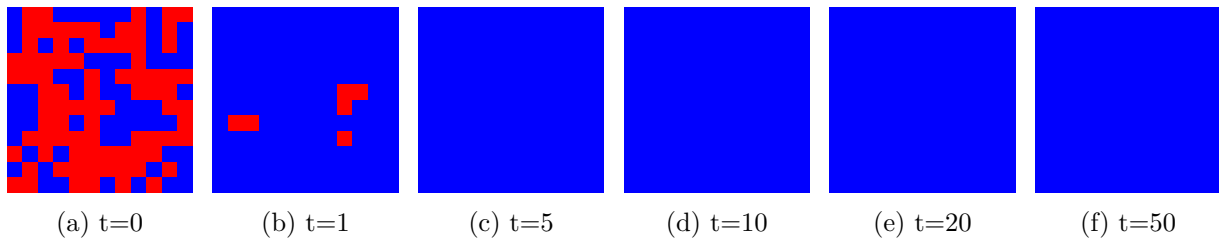
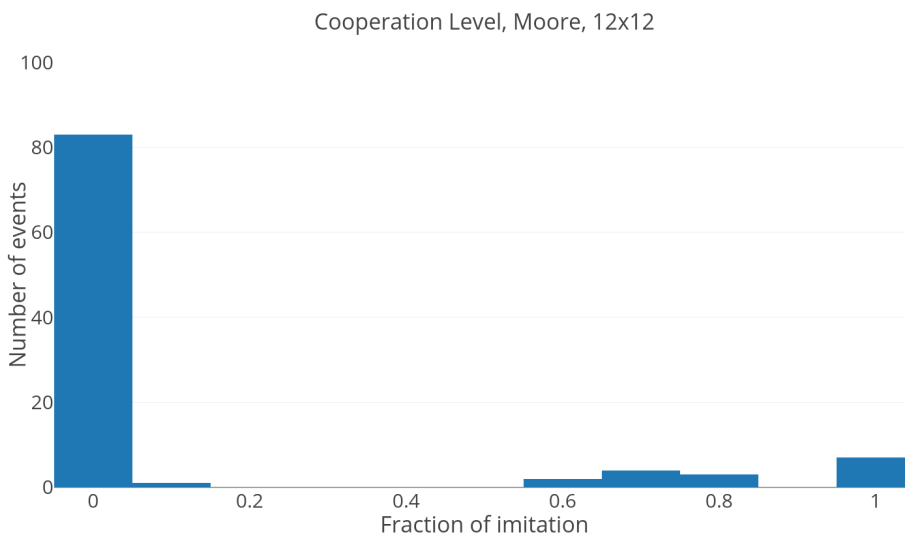
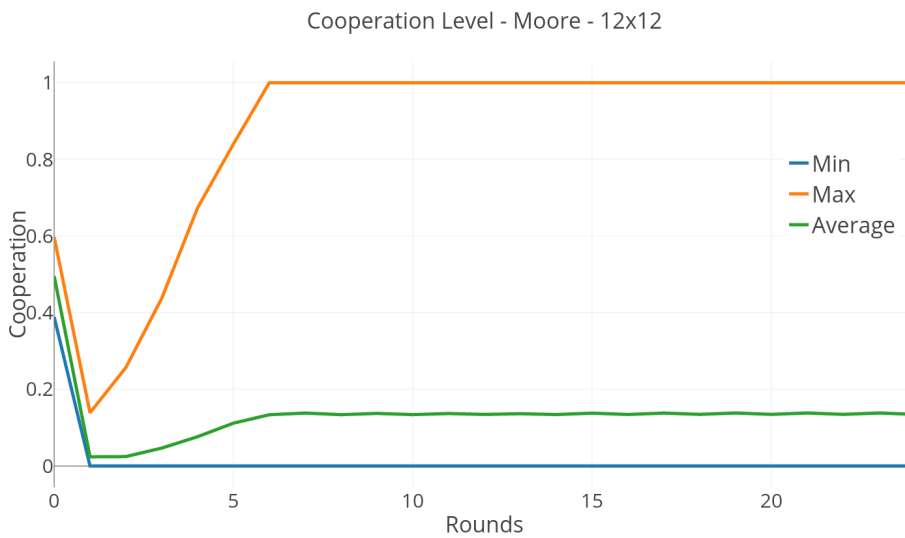


Figure 5: Prisoners Dilemma, Moore, 12x12



converge at 10, 25 rounds

From simulating 100 runs we observe that all converge to *defecting*. It is however possible that it converges to a cooperative field, but it requires that we have a sub-matrix of 2x2 with only cooperators and all other players being defectors. This did obviously not happen during one of the simulations.

### 1.1.4 20x20

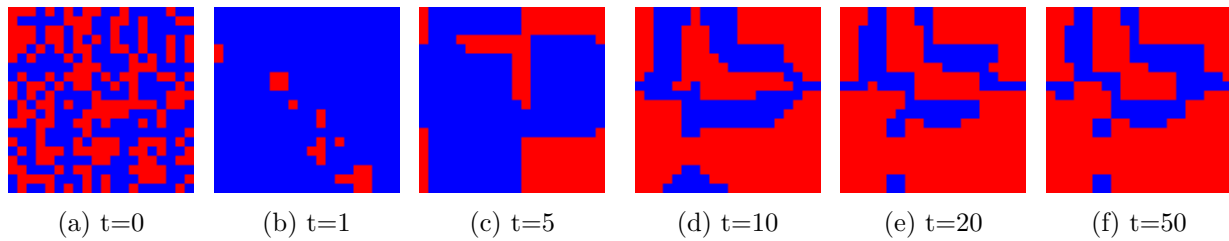
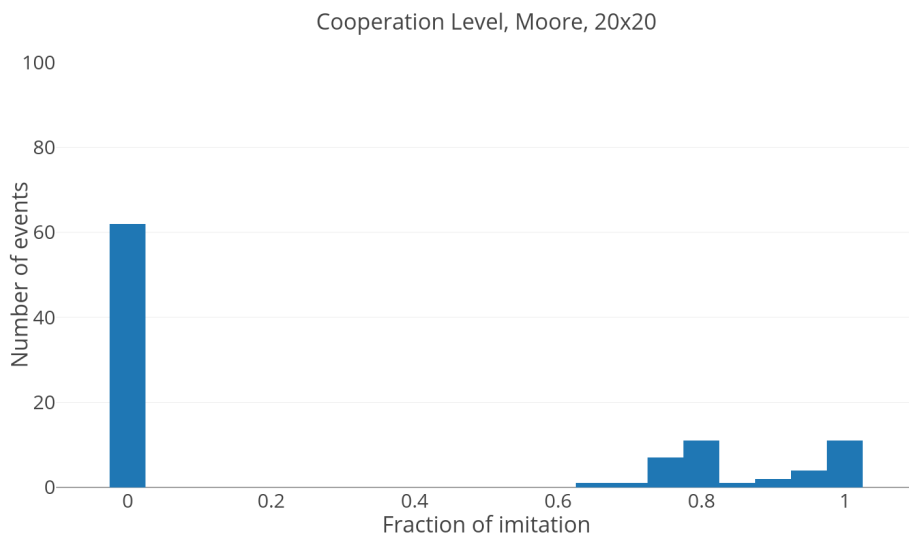
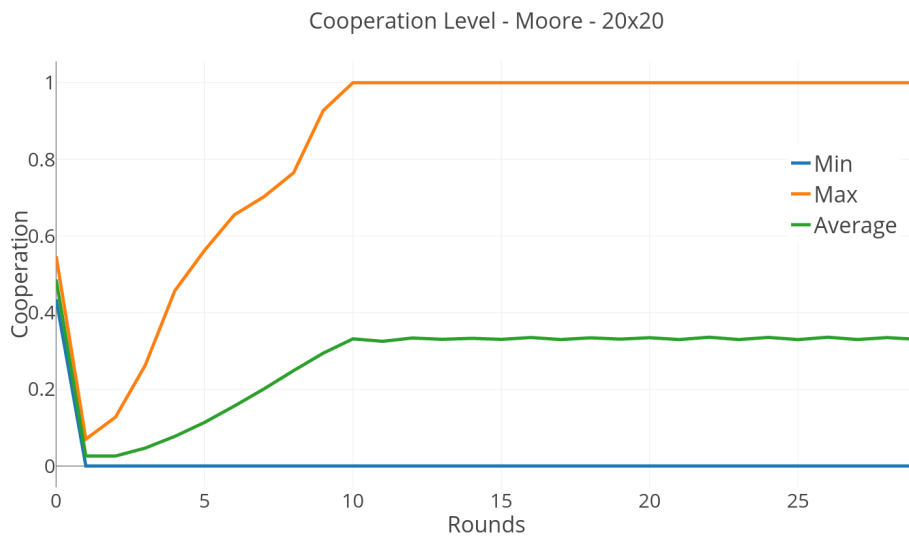


Figure 7: Prisoners Dilemma, Moore, 20x20



mean = 0.3305  
deviation = 0.4262

From simulating 100 runs we observe that all converge to *defecting*. It is however possible that it converges to a cooperative field, but it requires that we have a sub-matrix of 2x2 with only cooperators and all other players being defectors. This did obviously not happen during one of the simulations.

### 1.1.5 50x50

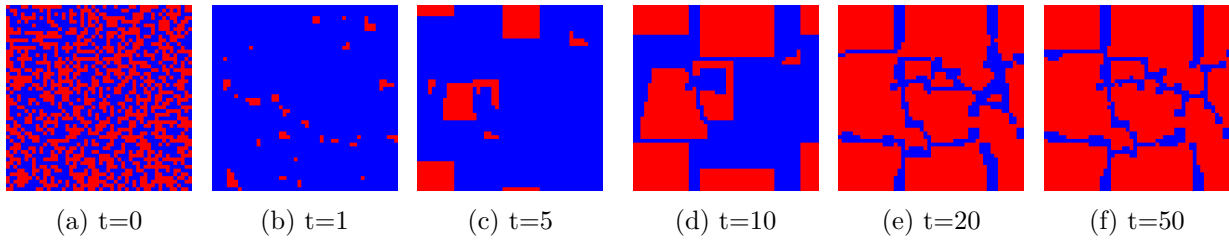
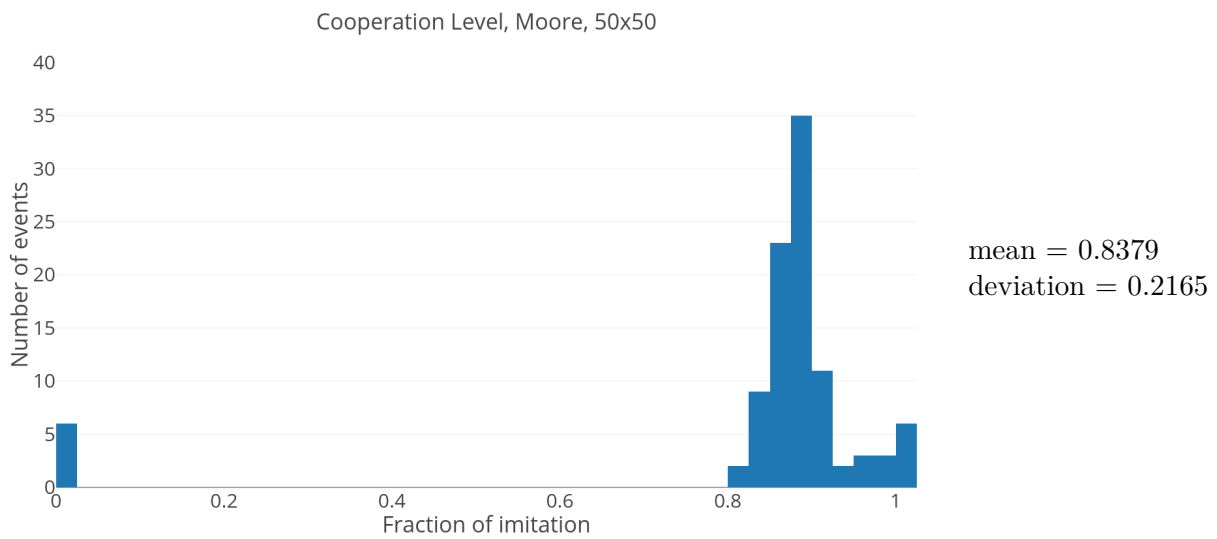
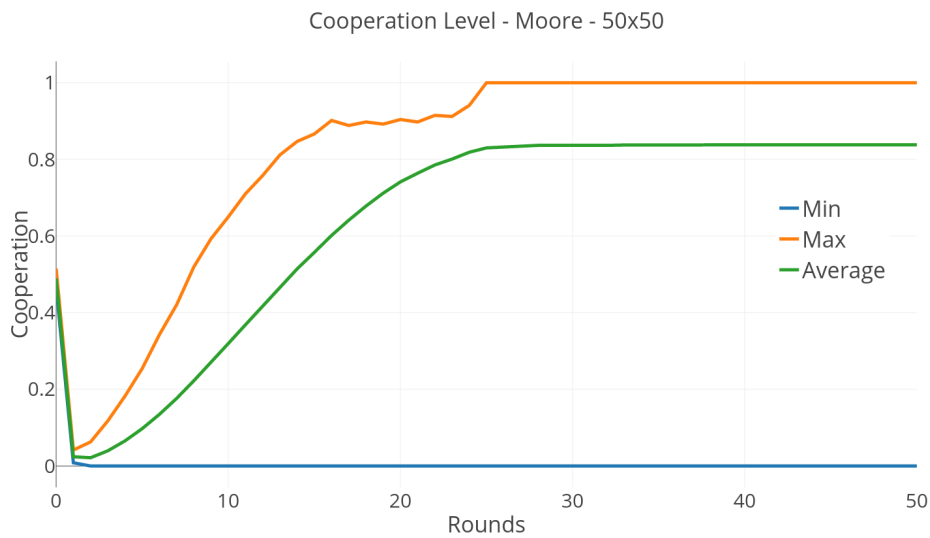


Figure 9: Prisoners Dilemma, Moore, 50x50



## 2 Part Two



### 3 Part Three