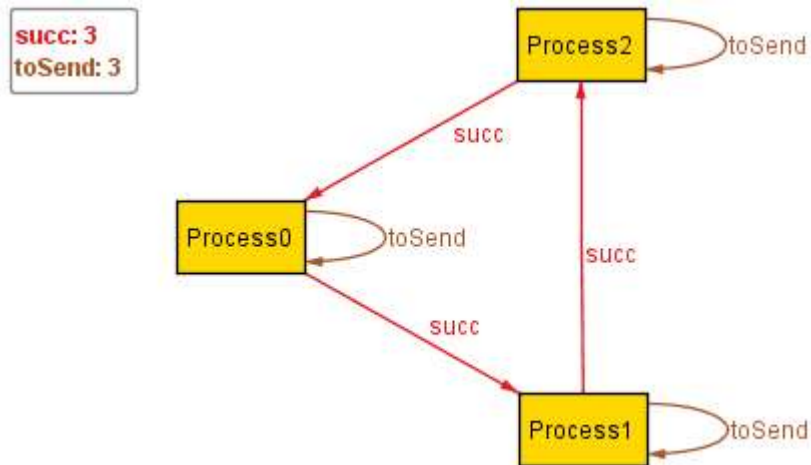


1)

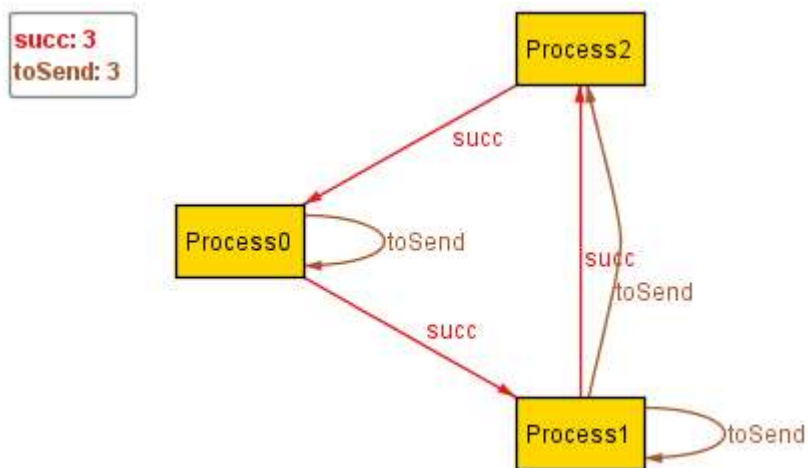
Time 0:

This is the initial state where they all are going to send their own id



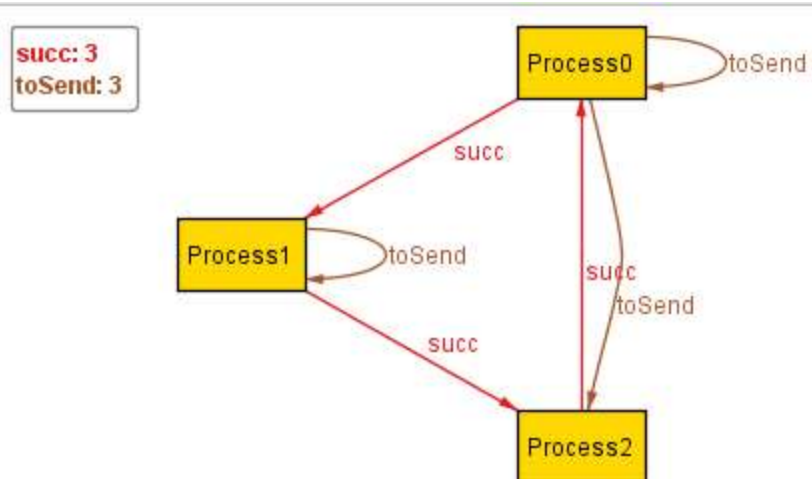
Time 1:

Process1 now wants to send Process 2 since it is higher



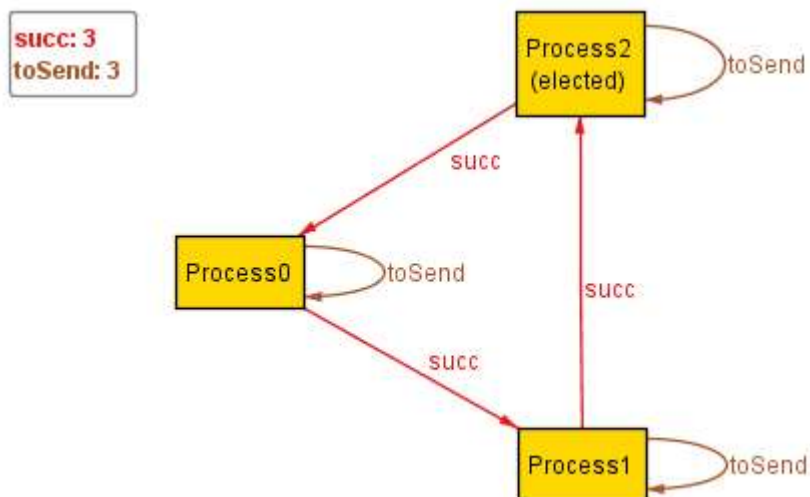
Time 2

Process0 now wants to send process 2



Time 3:

Process2 is now elected since it received itself



2)

Executing "Check AtMostOneElected for 3 Process, 7 Time"

Solver=sat4j Bitwidth=0 MaxSeq=0 SkolemDepth=1 Symmetry=20
2676 vars. 93 primary vars. 5707 clauses. 24ms.

No counterexample found. Assertion may be valid. 15ms.

3)

AtLeastOneElectedWithAnIssue does not require progress to be made with each step. Processes are allowed to skip steps as much as they want, so nothing will ever be accomplished.

4)

Executing "Check AtLeastOneElected for 3 Process, 7 Time"

Solver=sat4j Bitwidth=0 MaxSeq=0 SkolemDepth=1 Symmetry=20
2713 vars. 93 primary vars. 6084 clauses. 23ms.

No counterexample found. Assertion may be valid. 20ms.

This is valid since their assertion requires progress to be made for each step in time.

5)

Not getting a new instance means that there is no way to go through 13 steps without repeating a state. This is an upper bound on how many periods that we will need to go through before we return to a state.

LAB

Q2:



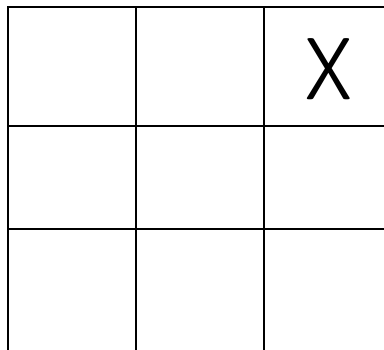
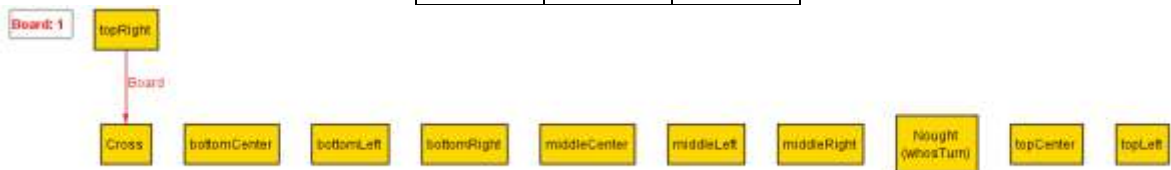
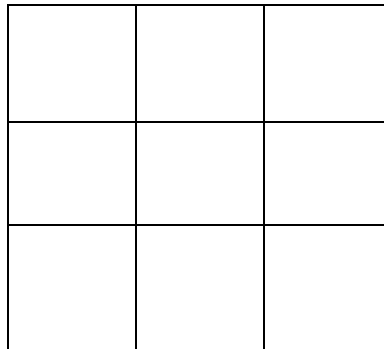
X	X	X

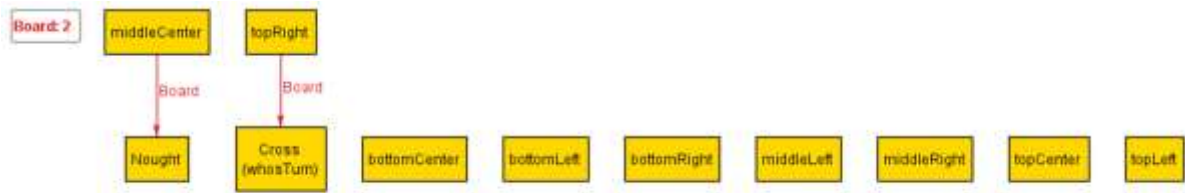
Q3:



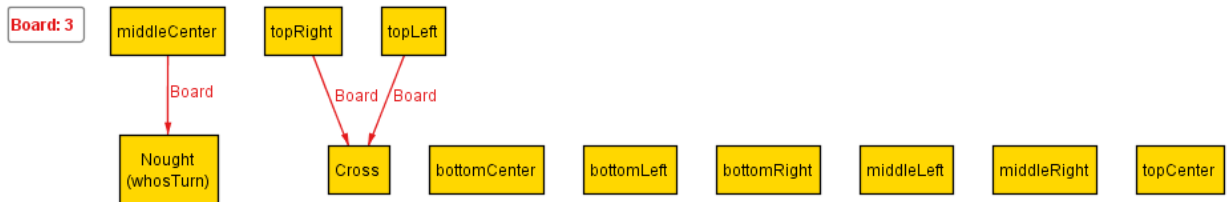
O	O	X
X	X	O
O	X	O

Q8:

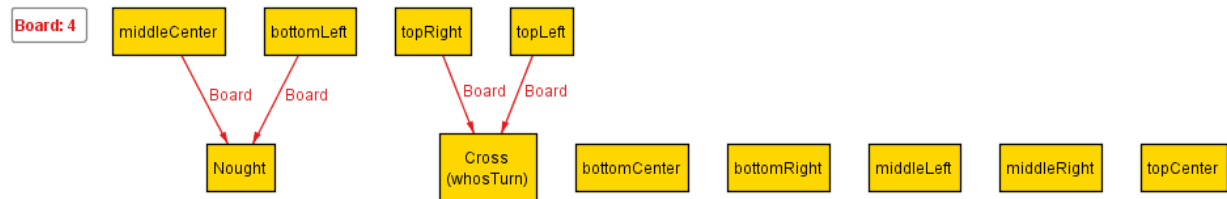




		X
	O	



X		X
	O	



X		X
---	--	---

Board: 5

middleCenter

bottomLeft

Board

Board

Nought
(whosTurn)

topRight

topLeft

topCenter

Board

Board

Board

Cross

bottomCenter

bottomRight

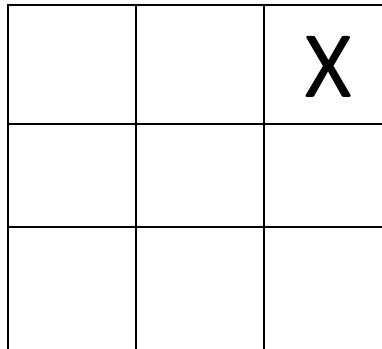
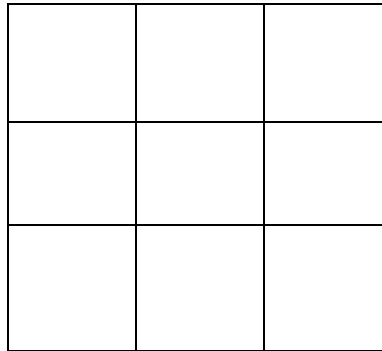
middleLeft

middleRight

	O	
O		

X	X	X
	O	
O		

Q9:



Board: 2

topCenter

topRight

Board

Board

Nought

Cross
(whosTurn)

bottomCenter

bottomLeft

bottomRight

middleCenter

middleLeft

middleRight

topLeft

	O	X

Board: 3

topRight

middleCenter

topCenter

Board

Board

Board

Cross

Nought
(whosTurn)

bottomCenter

bottomLeft

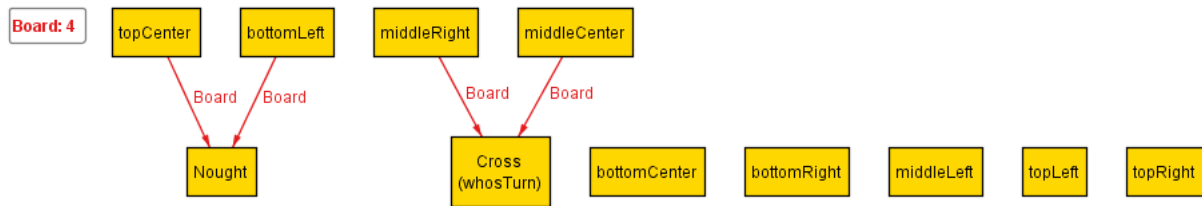
bottomRight

middleLeft

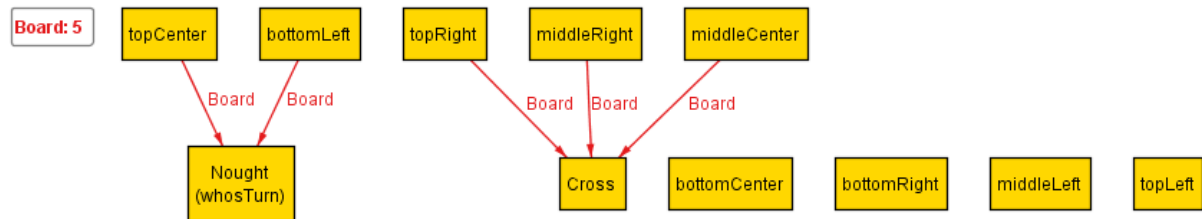
middleRight

topLeft

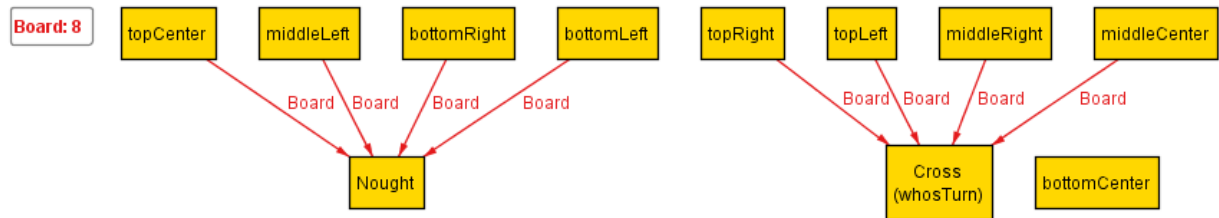
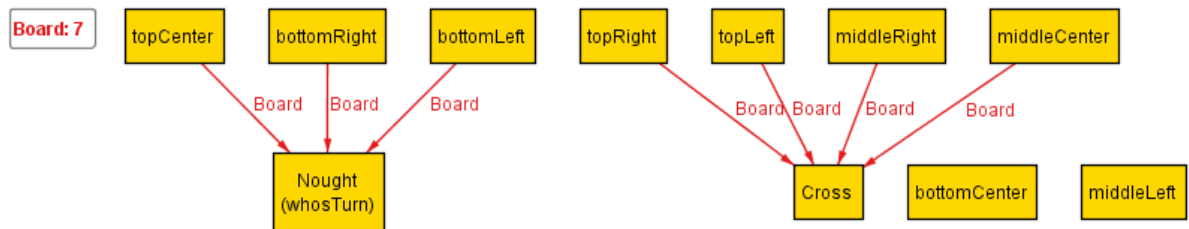
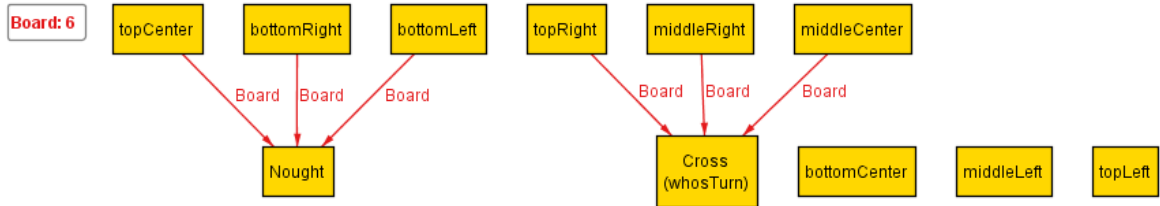
	O	X
	X	



	O	X
	X	
O		

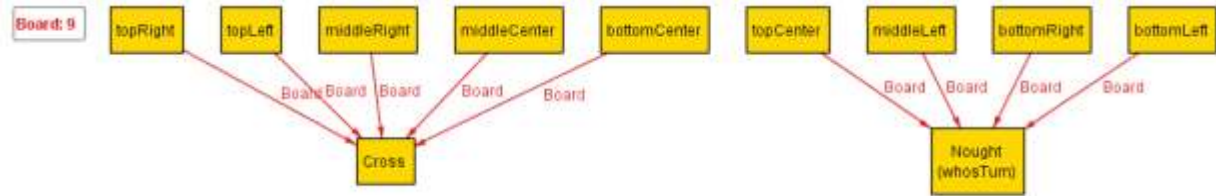


	O	X
	X	X
O		



X	O	X
---	---	---

O	X	X
O		O



X	O	X
O	X	X
O	X	O