

**Figures in section 1 to 4 similarity was caled by 1st version(with some problem)**

## 1 Simulation Results with random initialise

### 1.1 50\_3\_800\_100

Time used: 71.66908250172764s

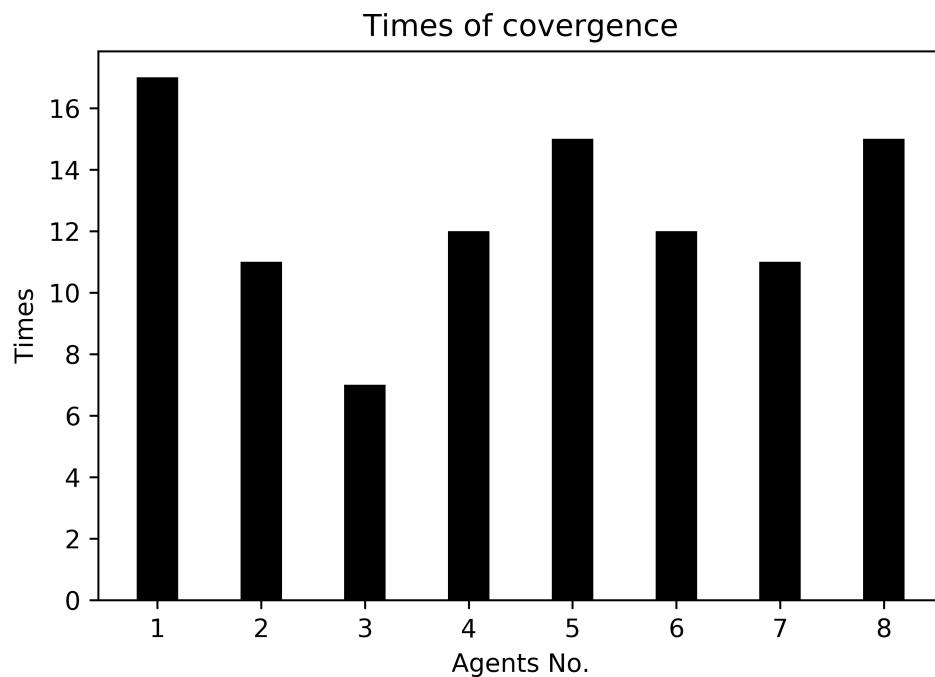


Figure 1: Where the iterations converge

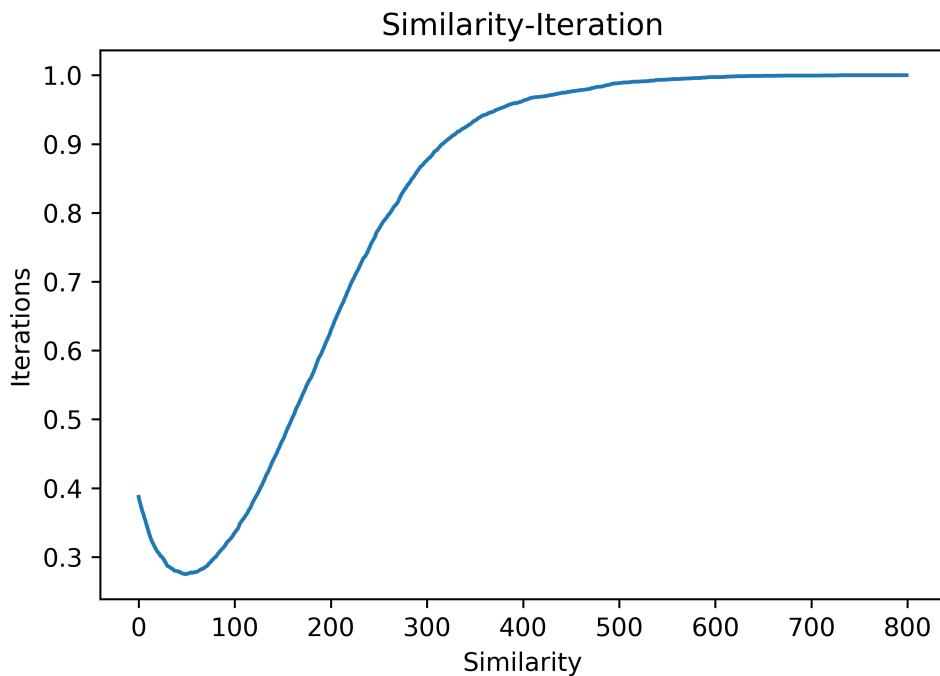


Figure 2: Similarity

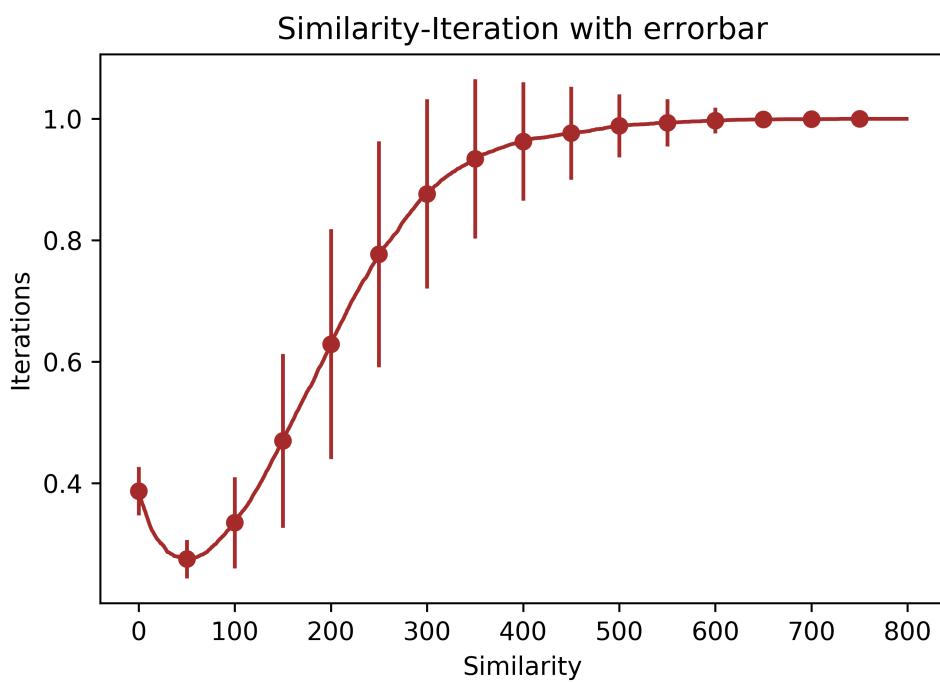


Figure 3: Similarity with error bar

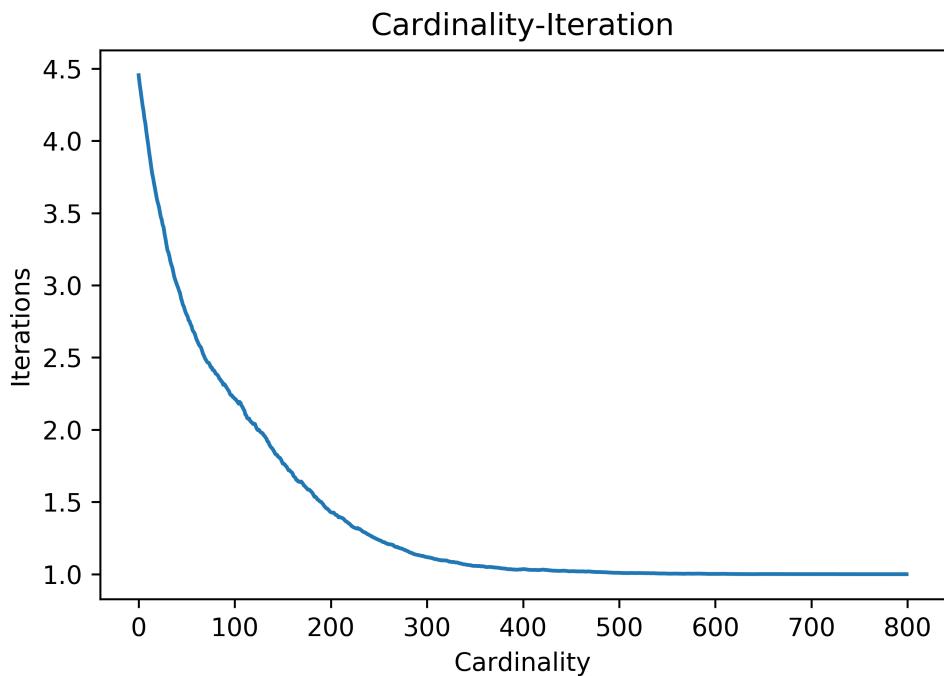


Figure 4: Cardinality

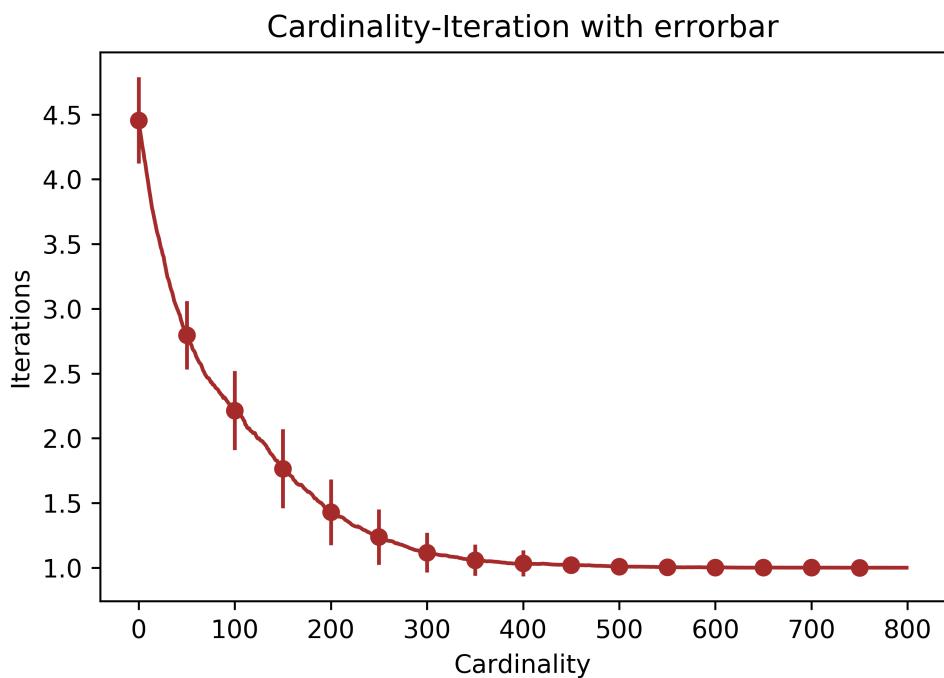


Figure 5: Cardinality with error bar

## 1.2 50\_4\_1000\_100

Time used: 87.256231800553s

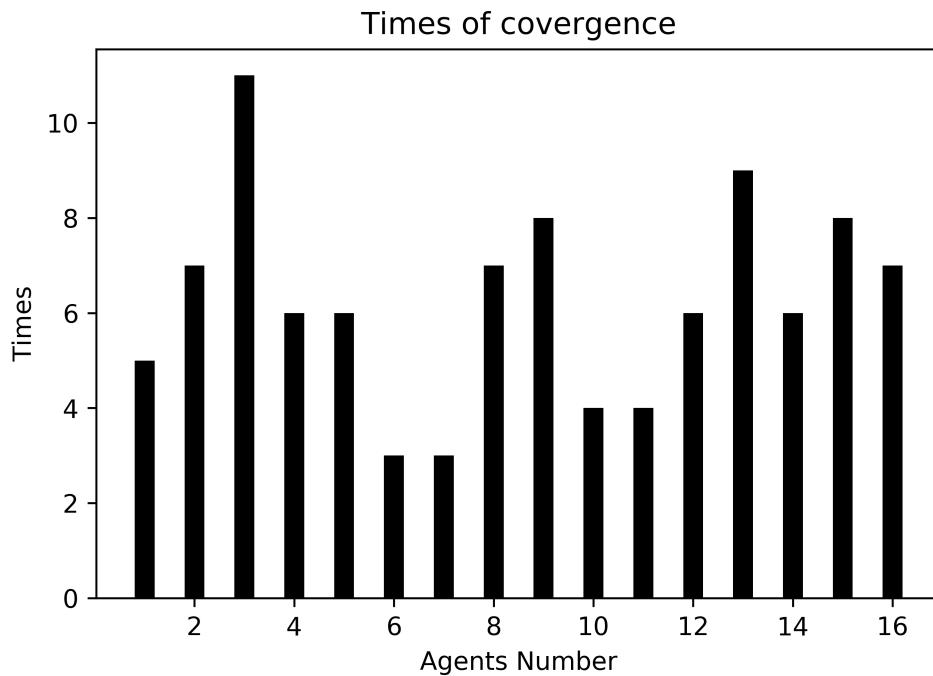


Figure 6: Where the iterations converge

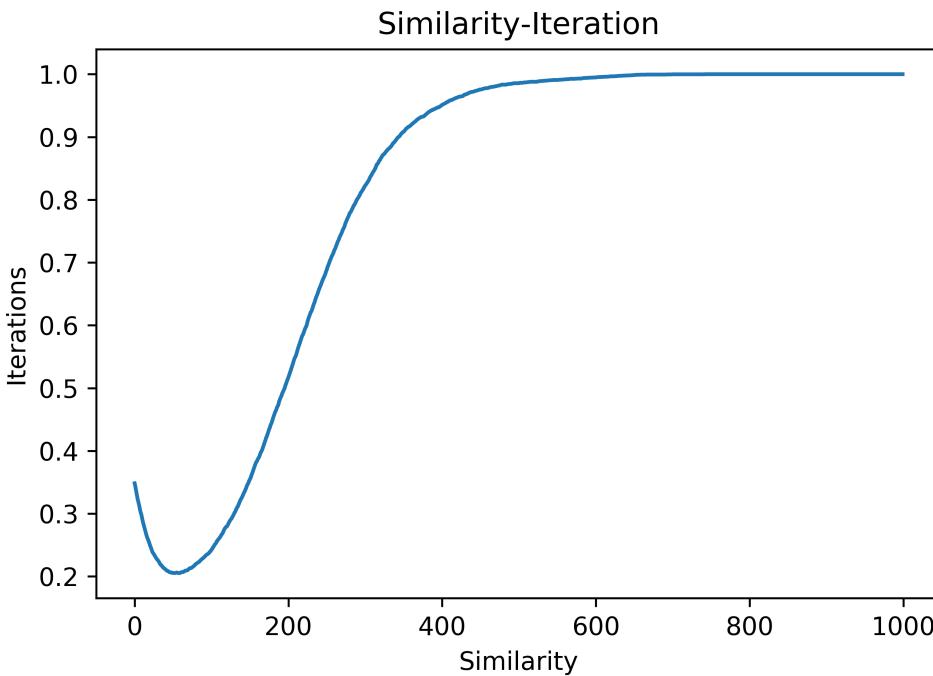


Figure 7: Similarity

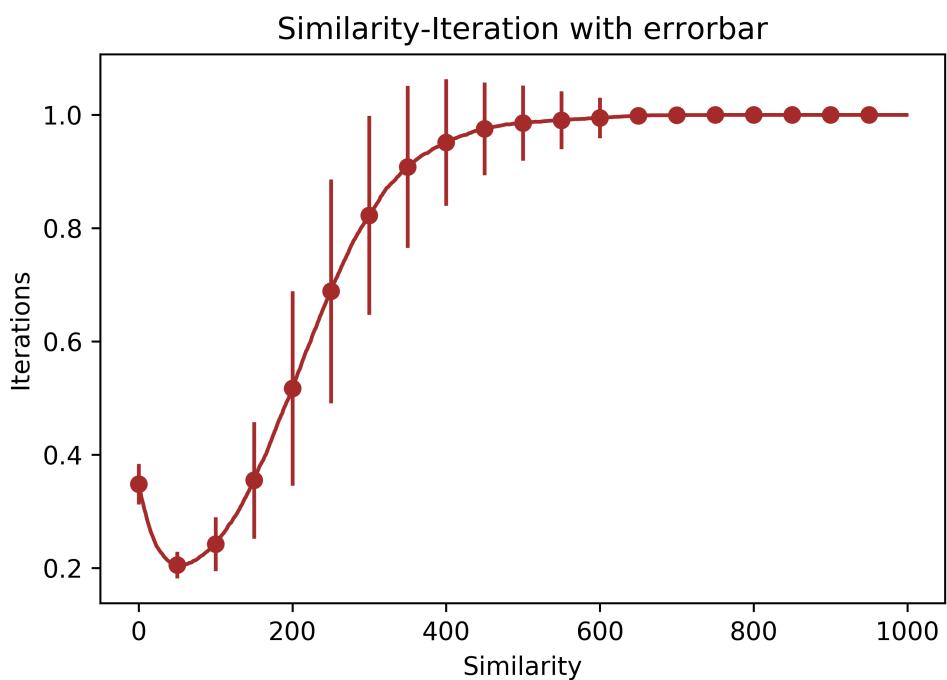


Figure 8: Similarity with error bar

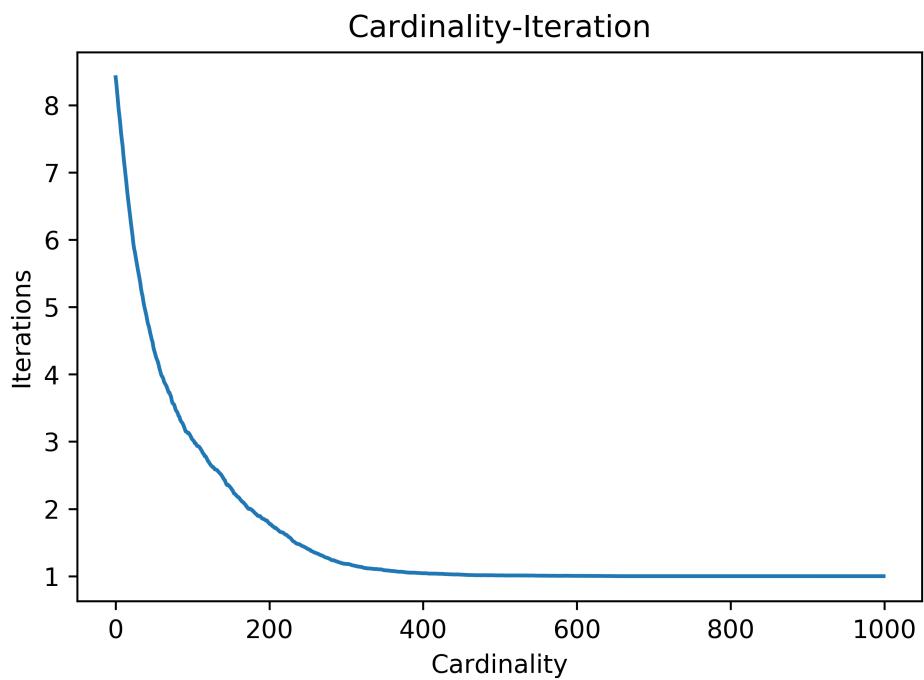


Figure 9: Cardinality

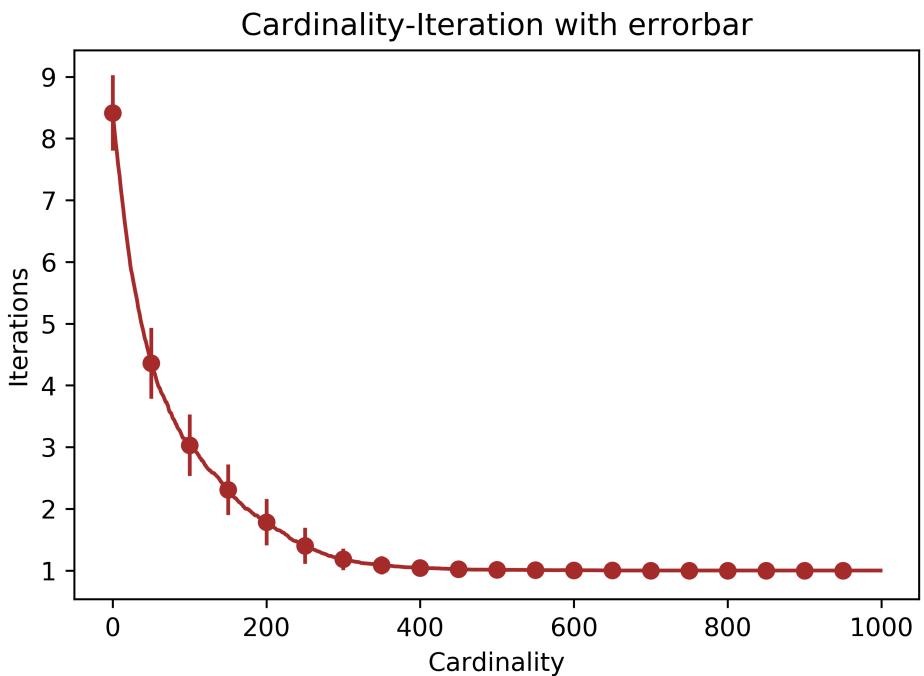


Figure 10: Cardinality with error bar

### 1.3 50\_4\_1000\_300

Time used: 247.07707320986628

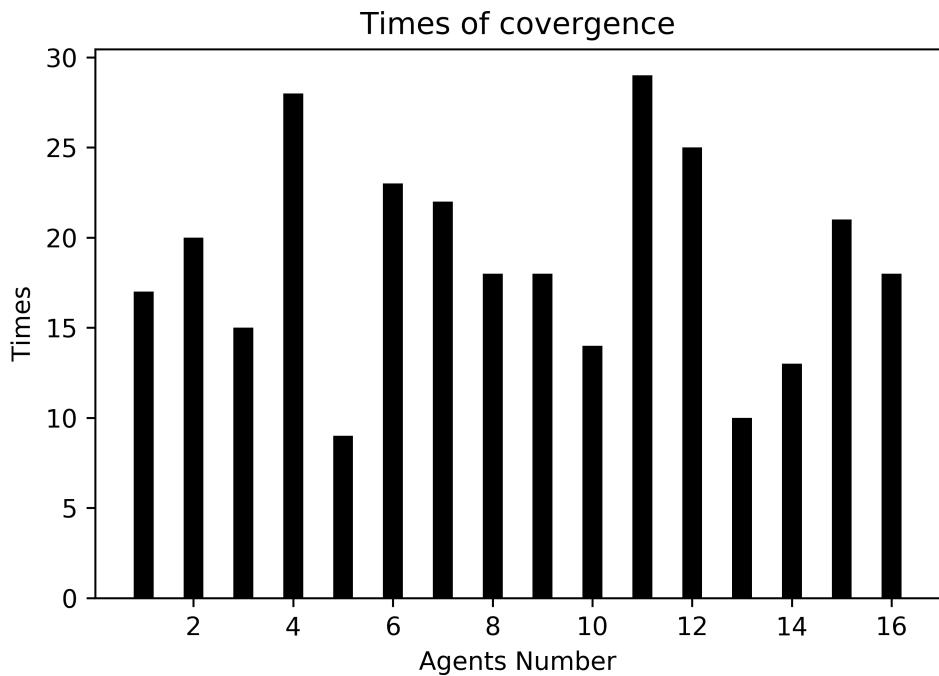


Figure 11: Where the iterations converge

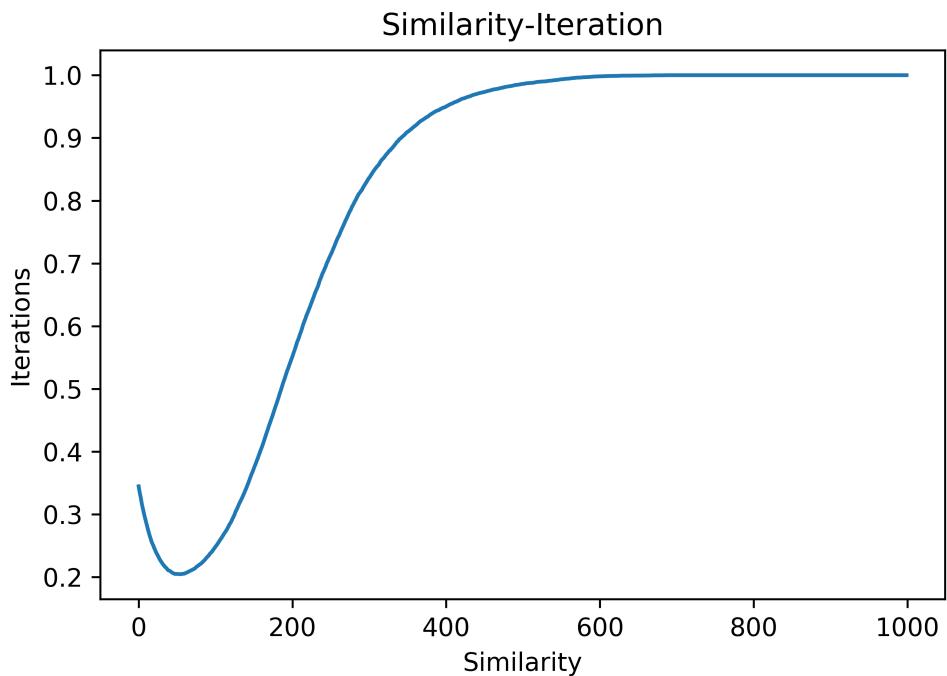


Figure 12: Similarity

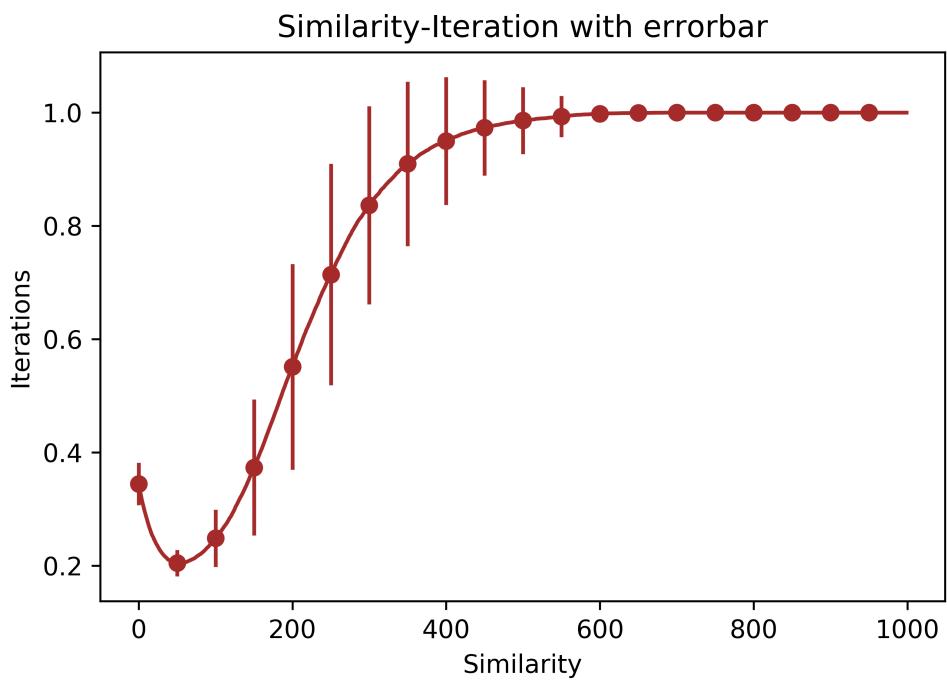


Figure 13: Similarity with error bar

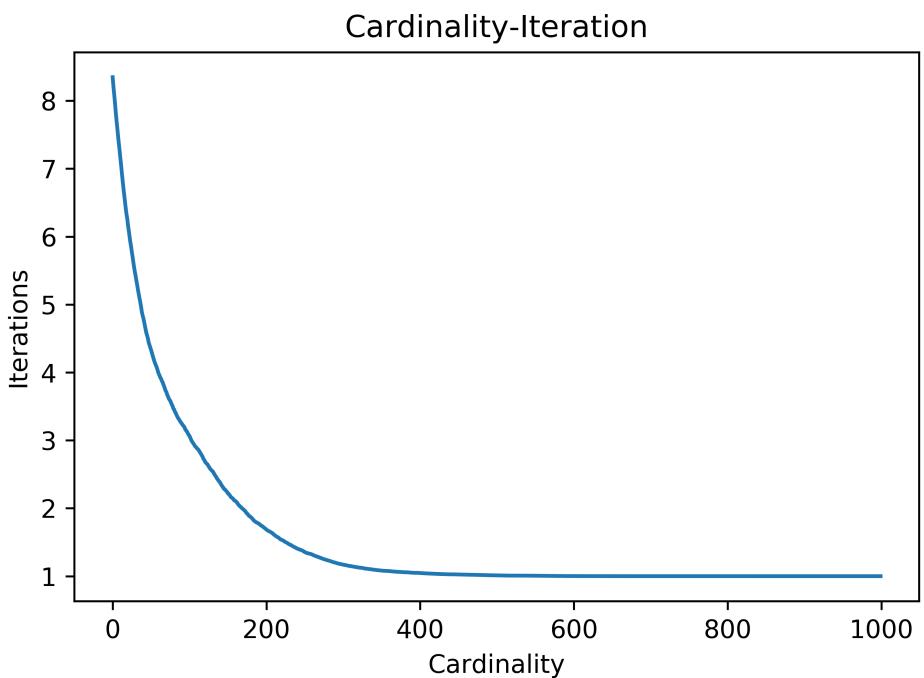


Figure 14: Cardinality

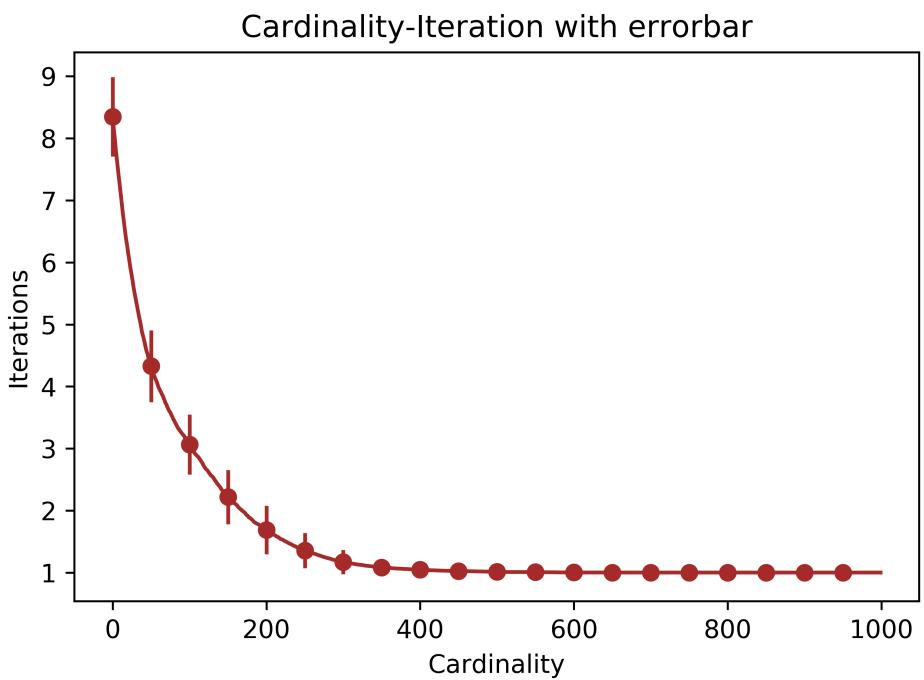


Figure 15: Cardinality with error bar

## 1.4 50\_4\_1000\_800

Time used: 726.9702704230385

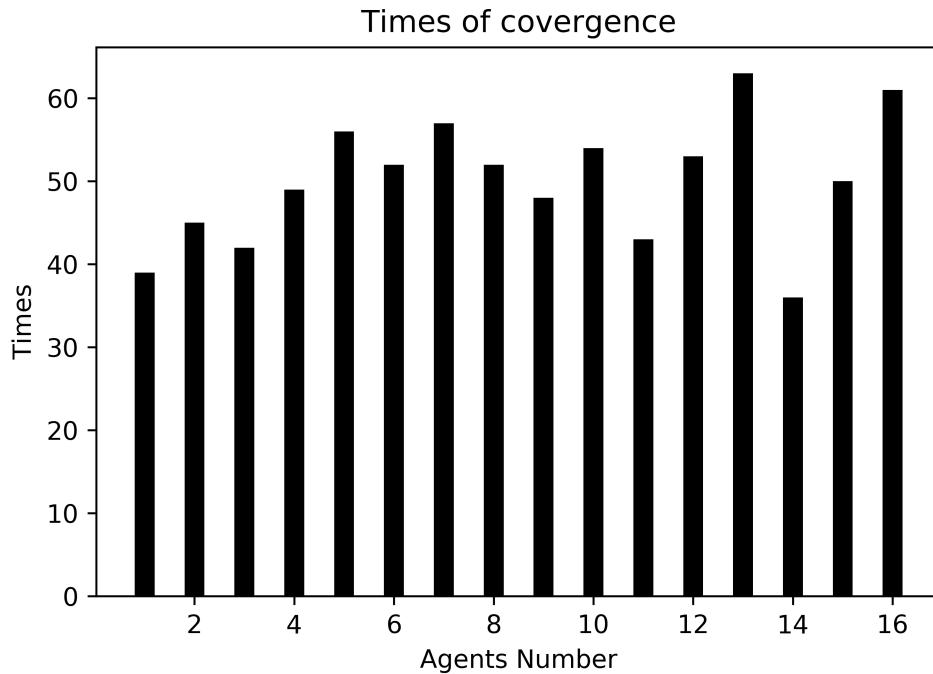


Figure 16: Where the iterations converge

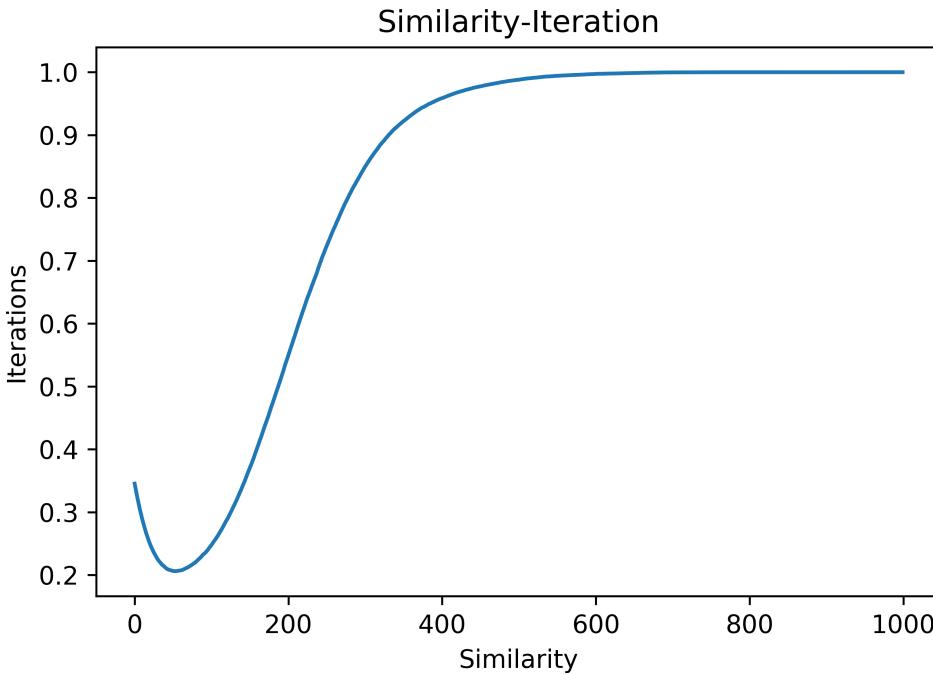


Figure 17: Similarity

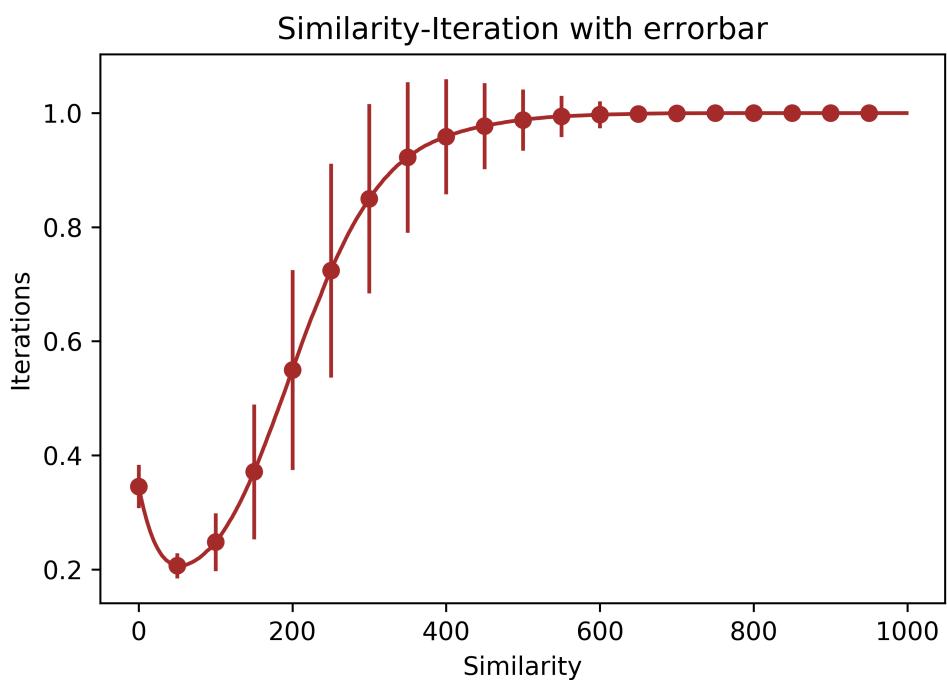


Figure 18: Similarity with error bar

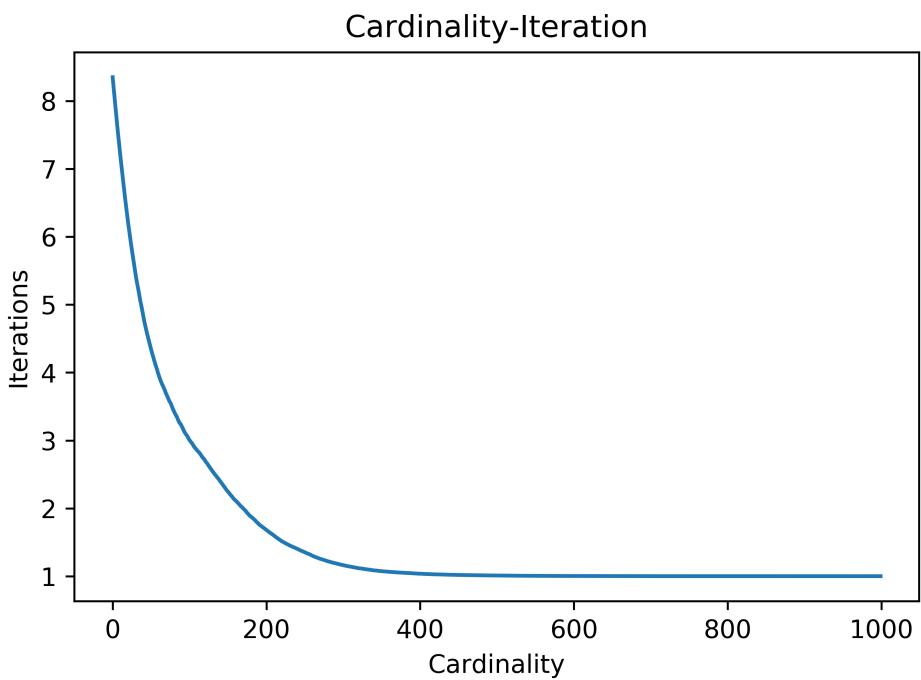


Figure 19: Cardinality

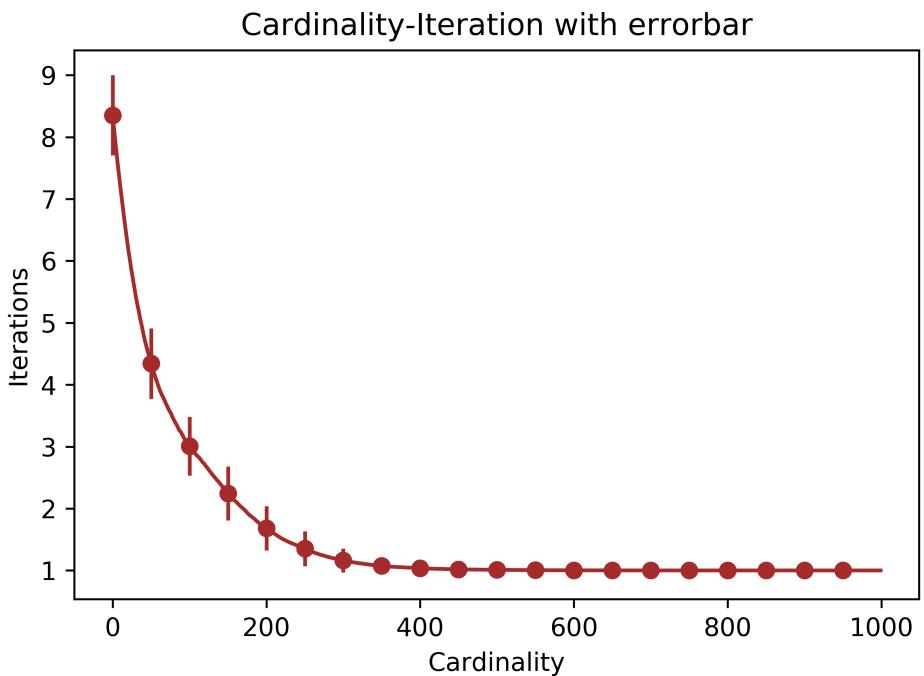


Figure 20: Cardinality with error bar

## 1.5 50\_4\_1000\_800

### Experiment 1

Time used: 1423.639460532976

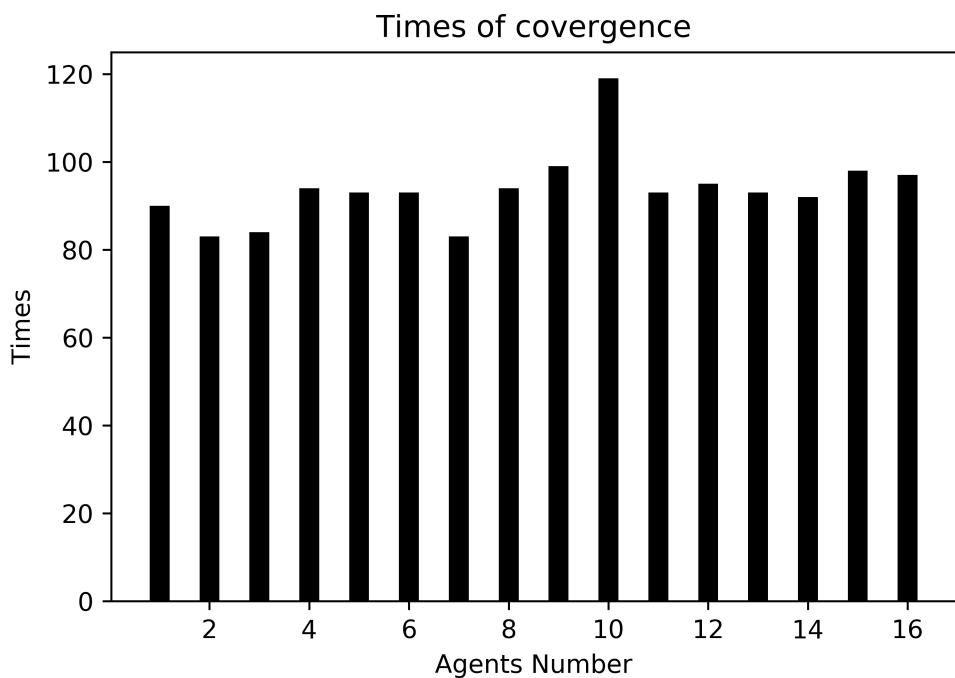


Figure 21: Where the iterations converge

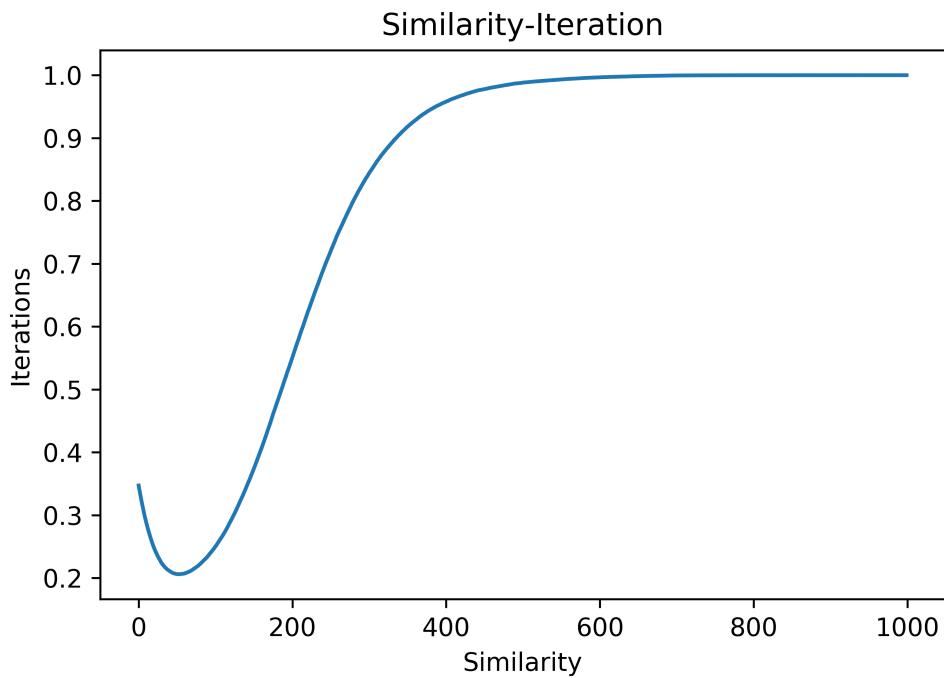


Figure 22: Similarity

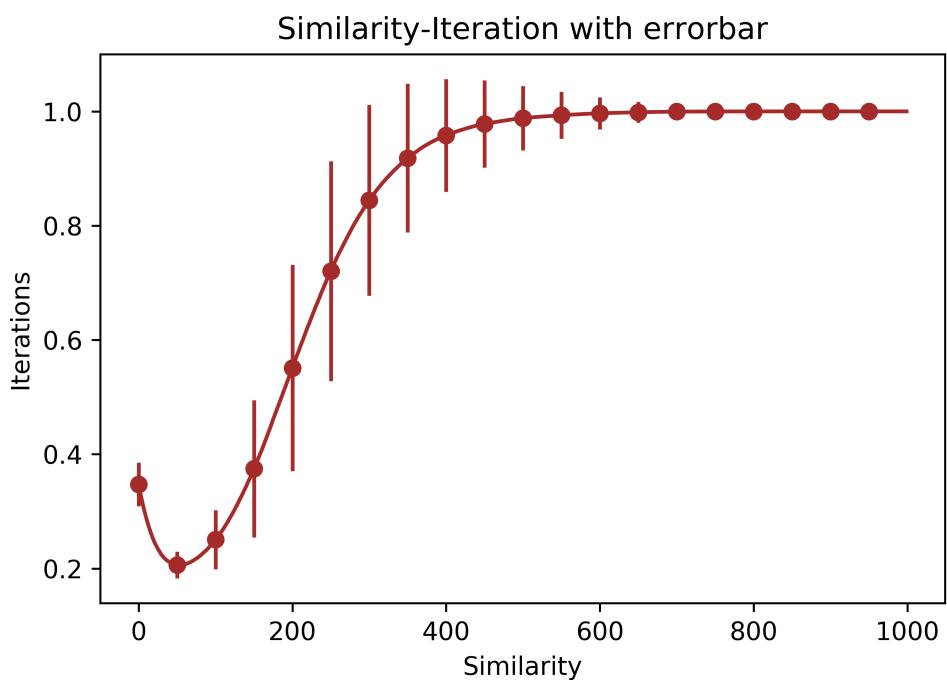


Figure 23: Similarity with error bar

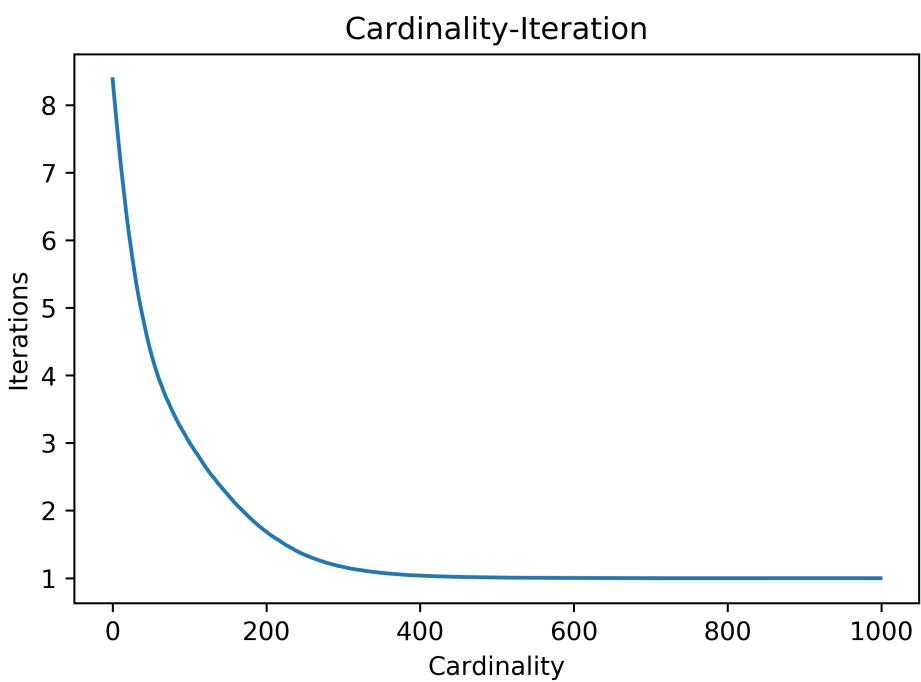


Figure 24: Cardinality

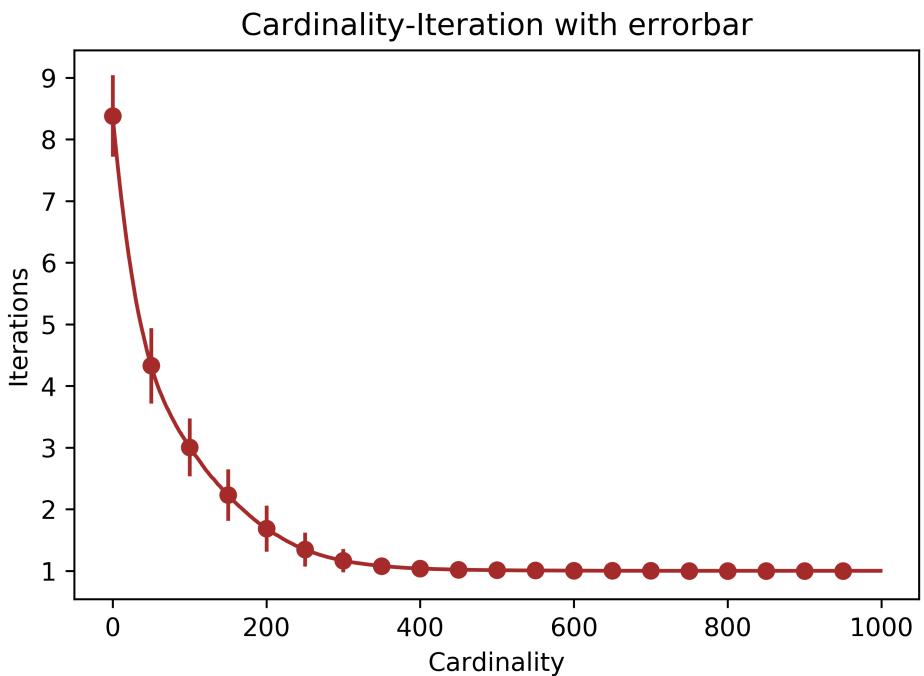


Figure 25: Cardinality with error bar

## Experiment 2

Time used: 2714.9842374045834(too long due the sleep of computer)

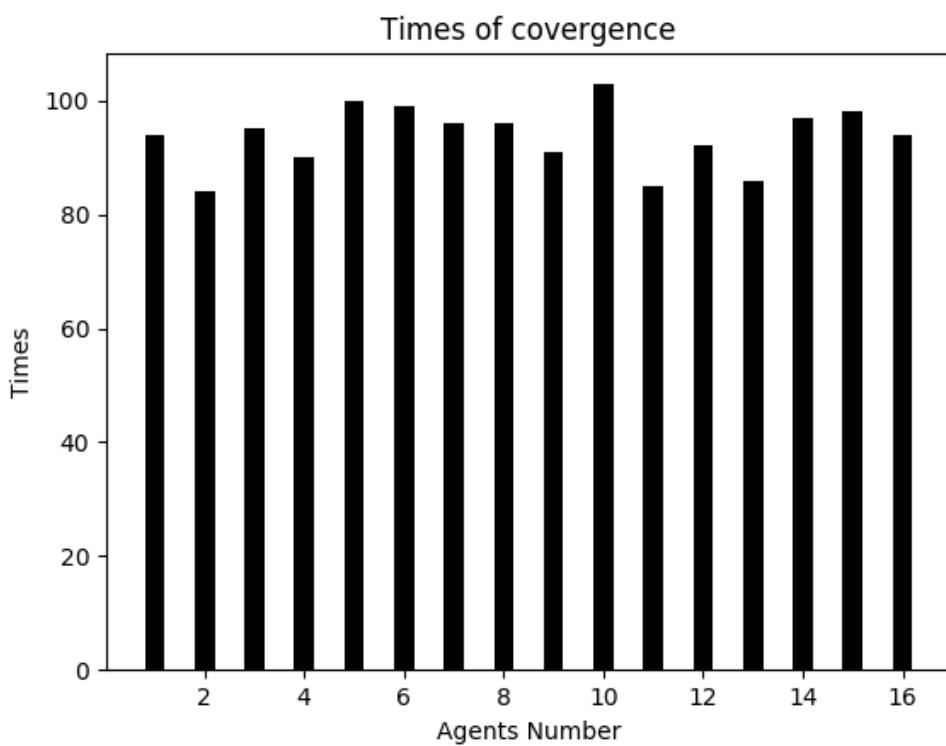


Figure 26: Where the iterations converge

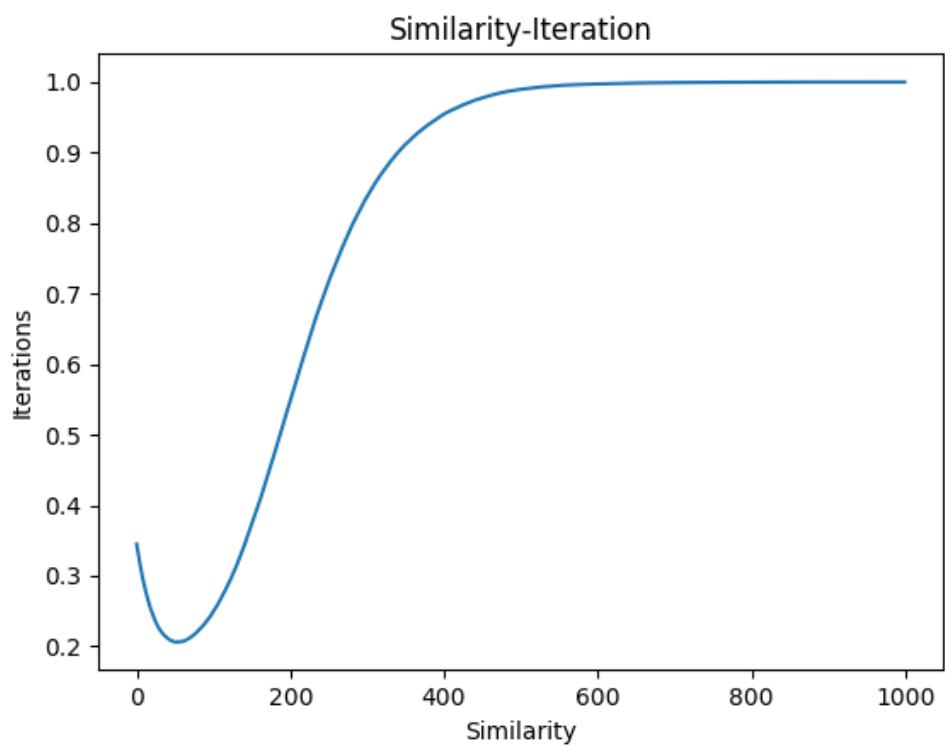


Figure 27: Similarity

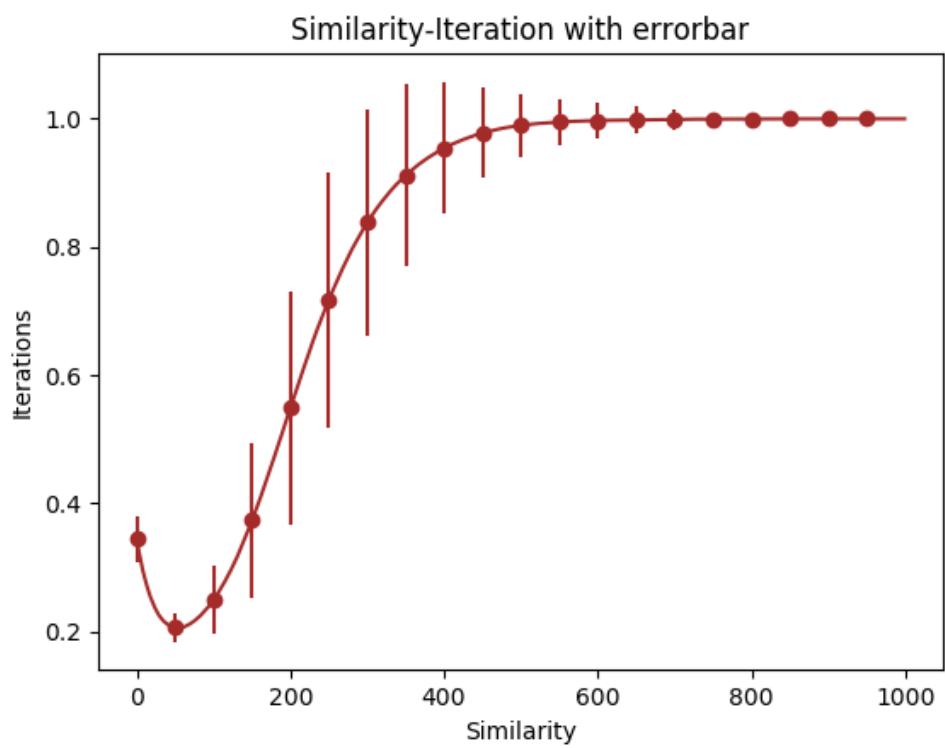


Figure 28: Similarity with error bar

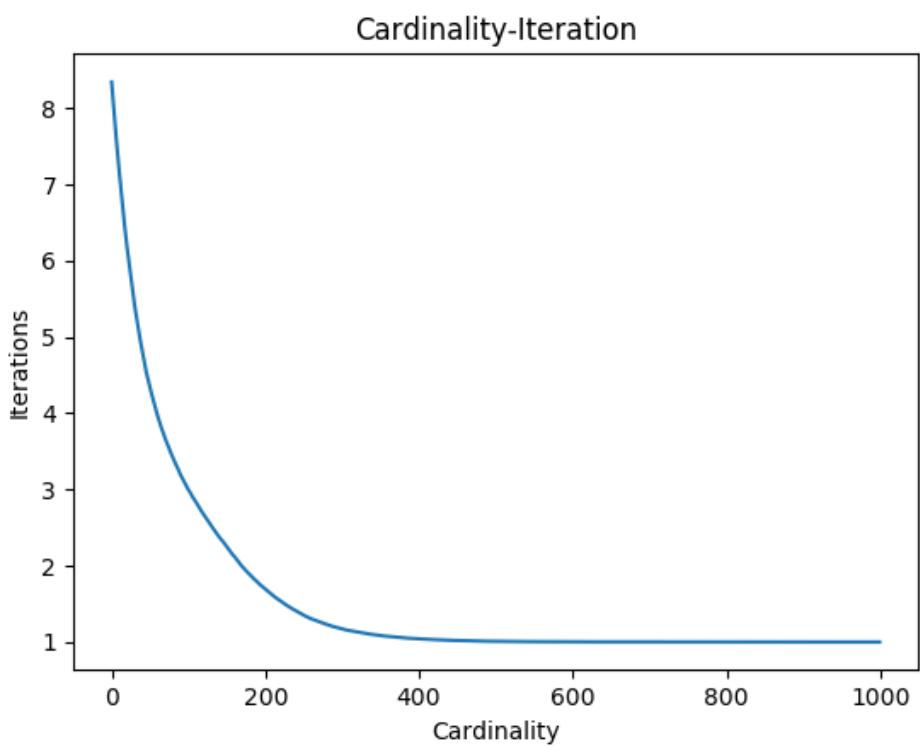


Figure 29: Cardinality

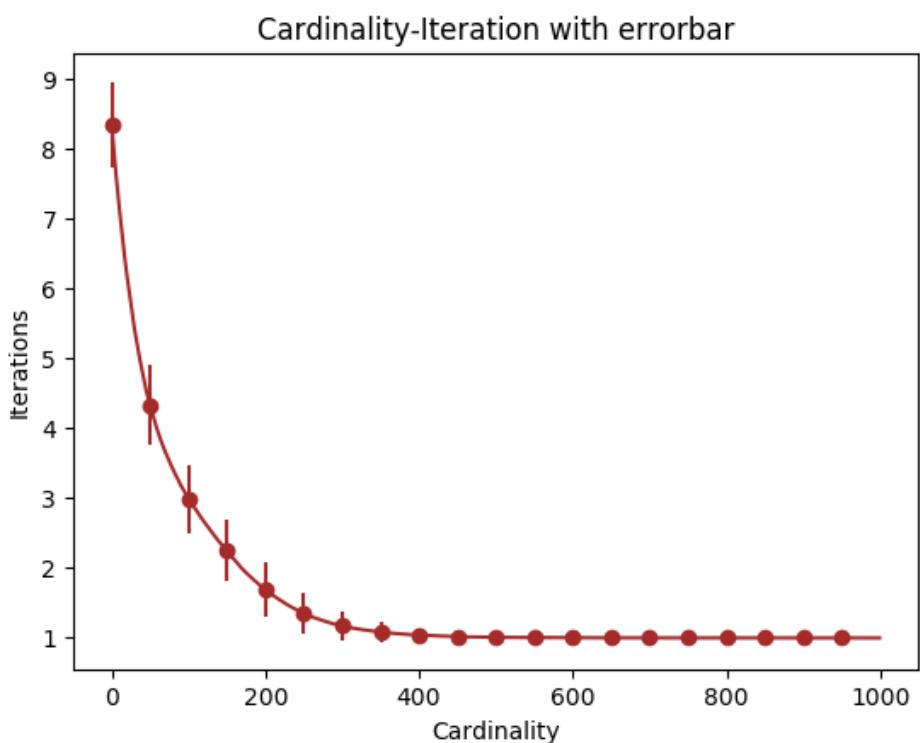


Figure 30: Cardinality with error bar

### Experiment 3

Time used: 1232.8931827431234

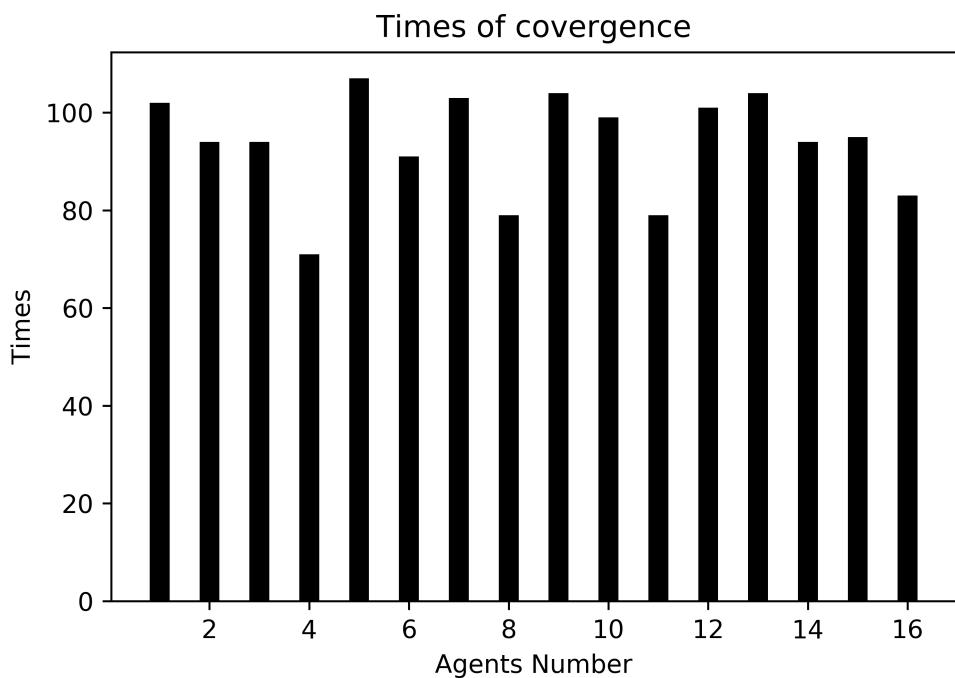


Figure 31: Where the iterations converge

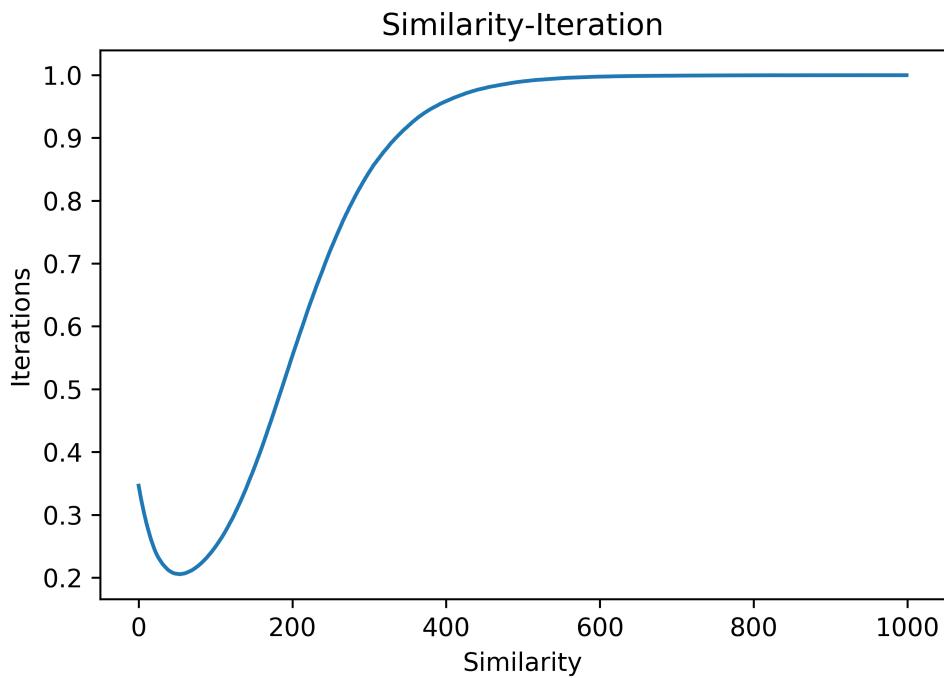


Figure 32: Similarity

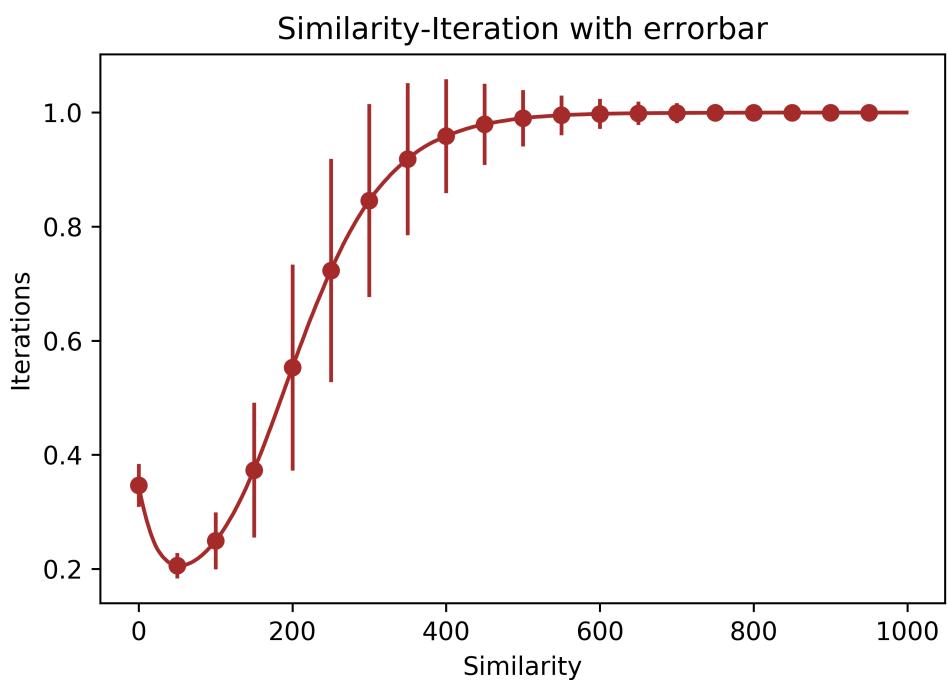


Figure 33: Similarity with error bar

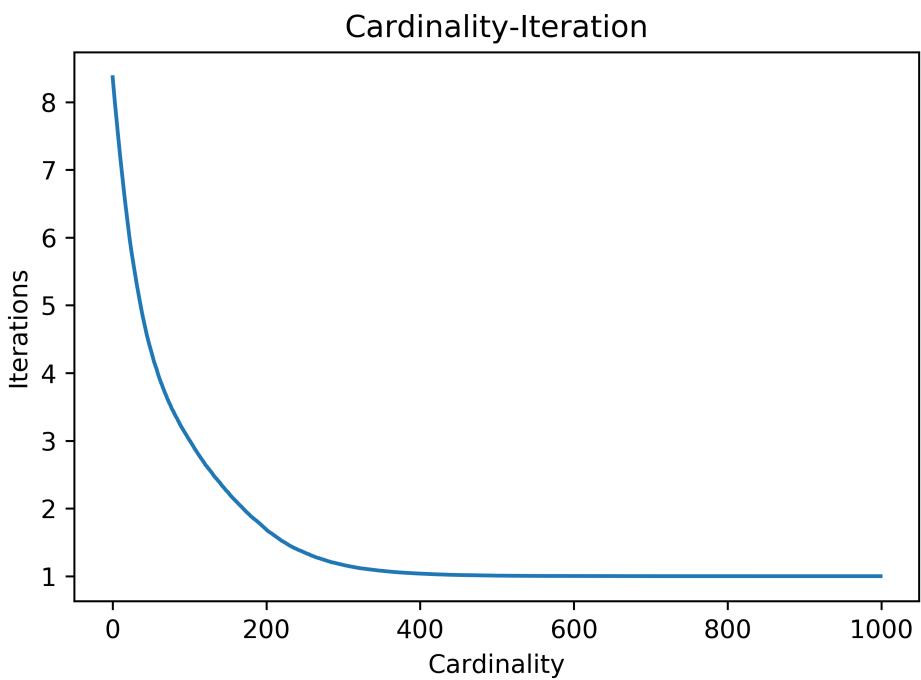


Figure 34: Cardinality

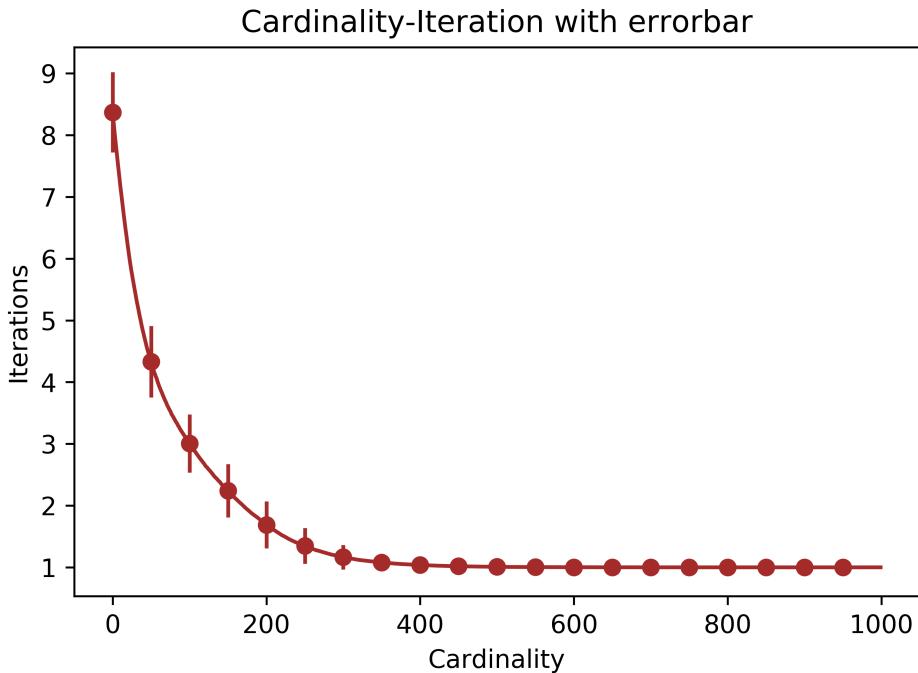


Figure 35: Cardinality with error bar

## 2 Simulation Results with random initialise combine beliefs based on hamming distance(min)

the title: number of agents\_propositions\_iteration\_Times run\_threshold(Hamming distance)

### 2.1 50\_4\_1000\_100\_0.5

Time used: 84.14613086056161s

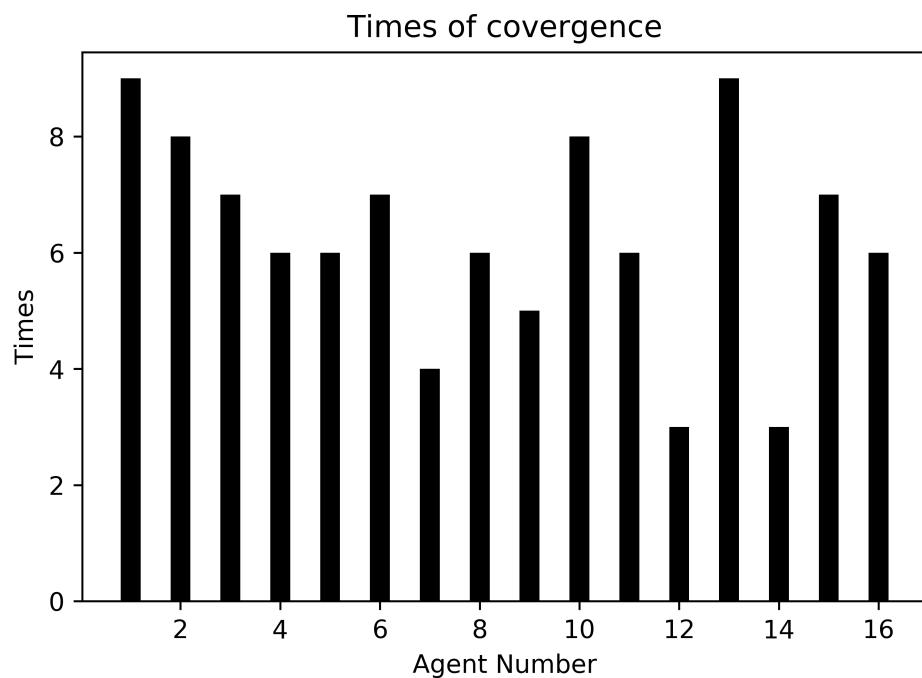


Figure 36: Where the iterations converge

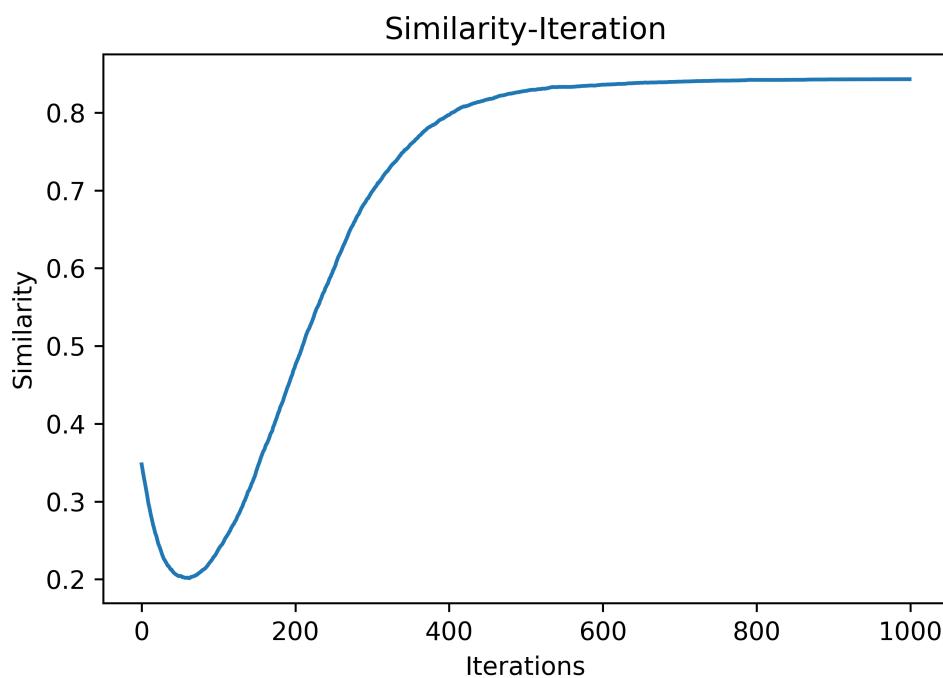


Figure 37: Similarity

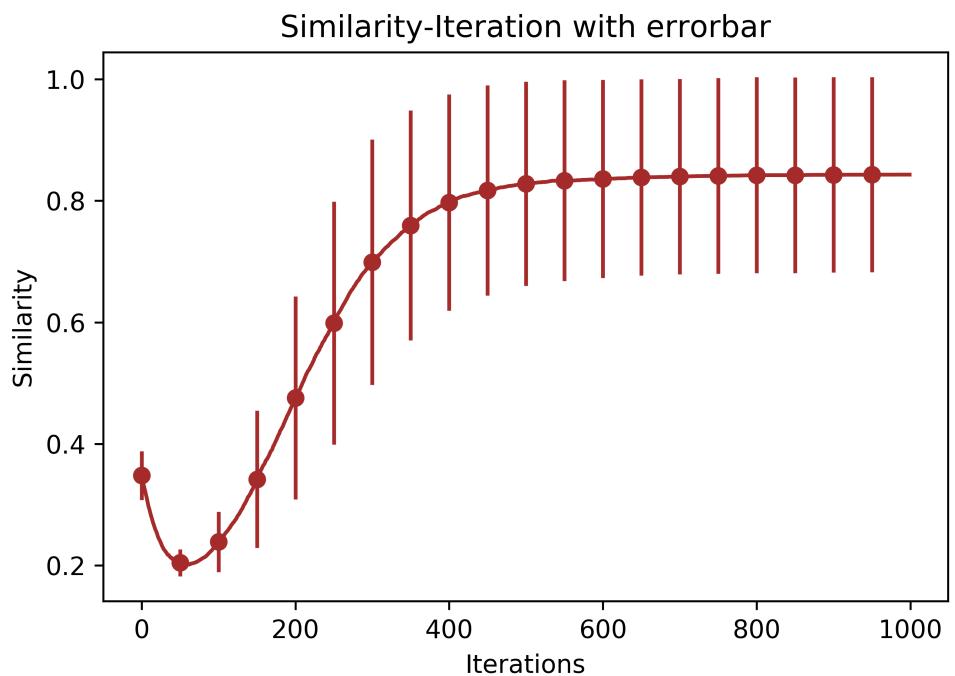


Figure 38: Similarity with error bar

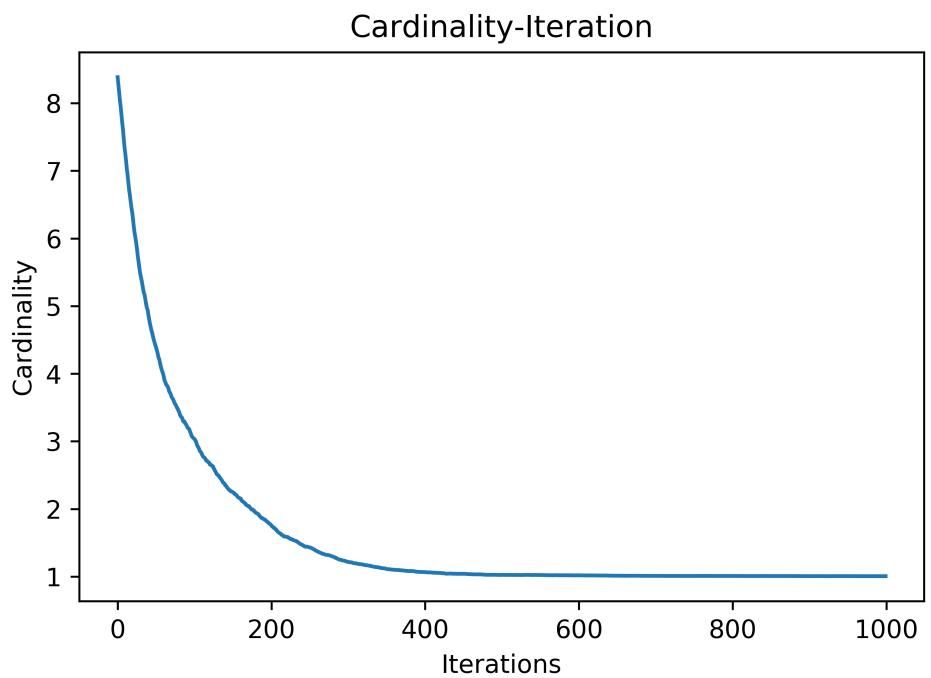


Figure 39: Cardinality

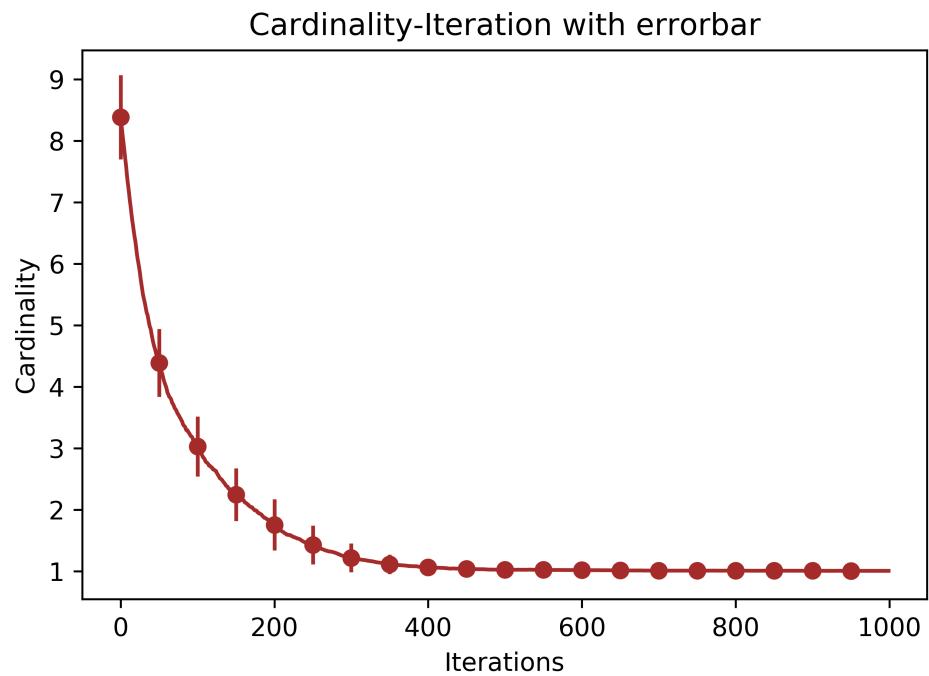


Figure 40: Cardinality with error bar

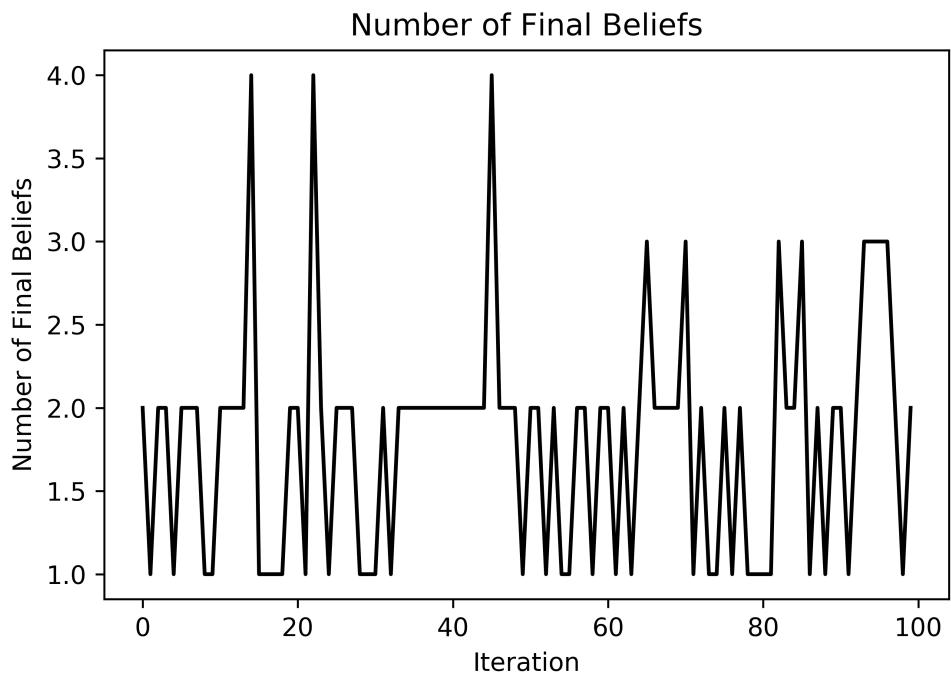


Figure 41: Cardinality with error bar

## 2.2 50\_5\_1200\_100\_0.3

Time used: 107.05263902594515s

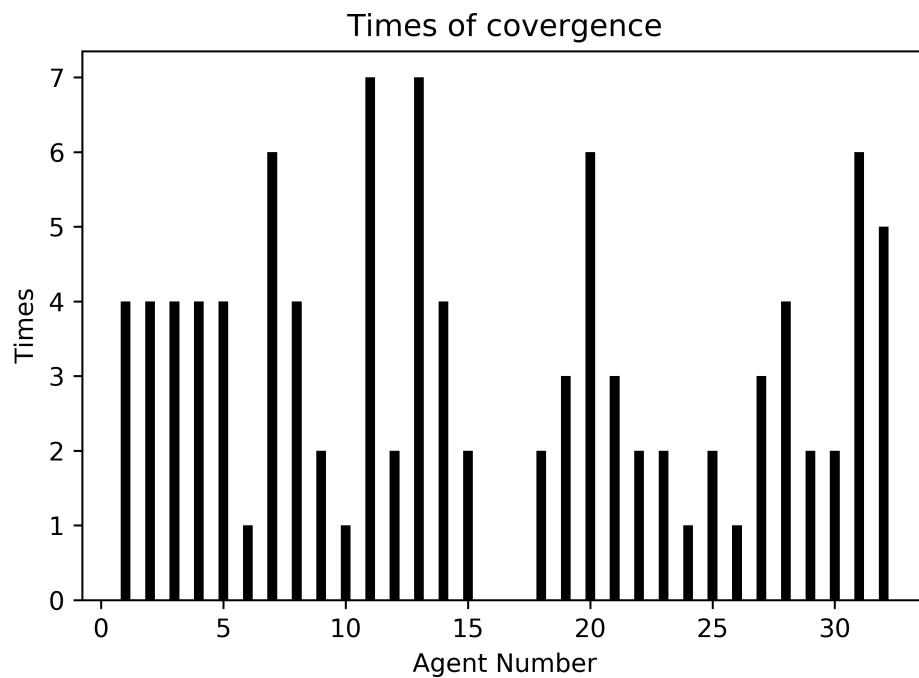


Figure 42: Where the iterations converge

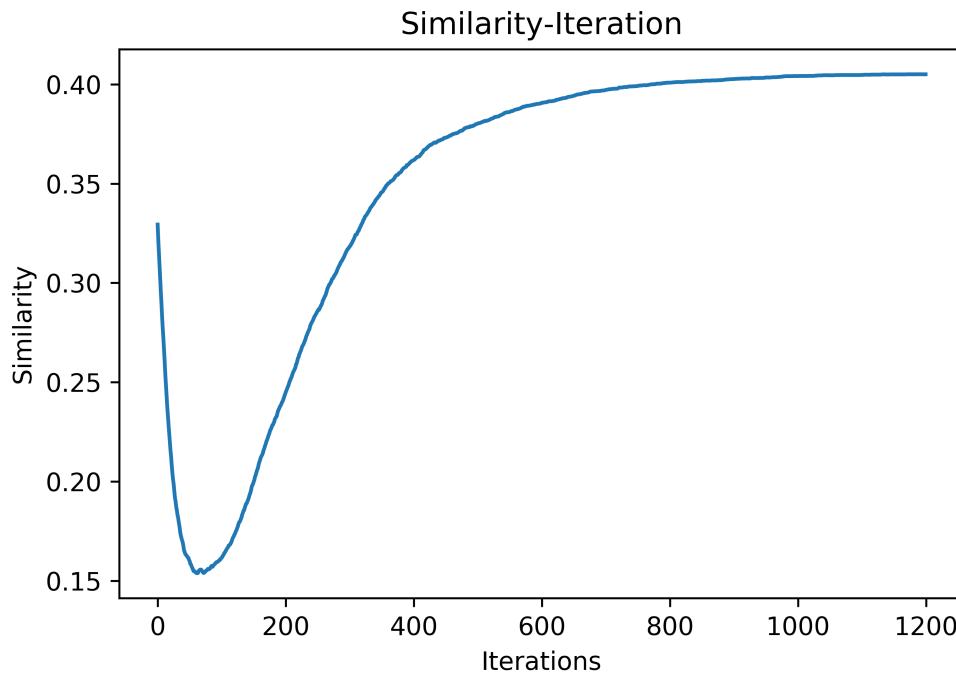


Figure 43: Similarity

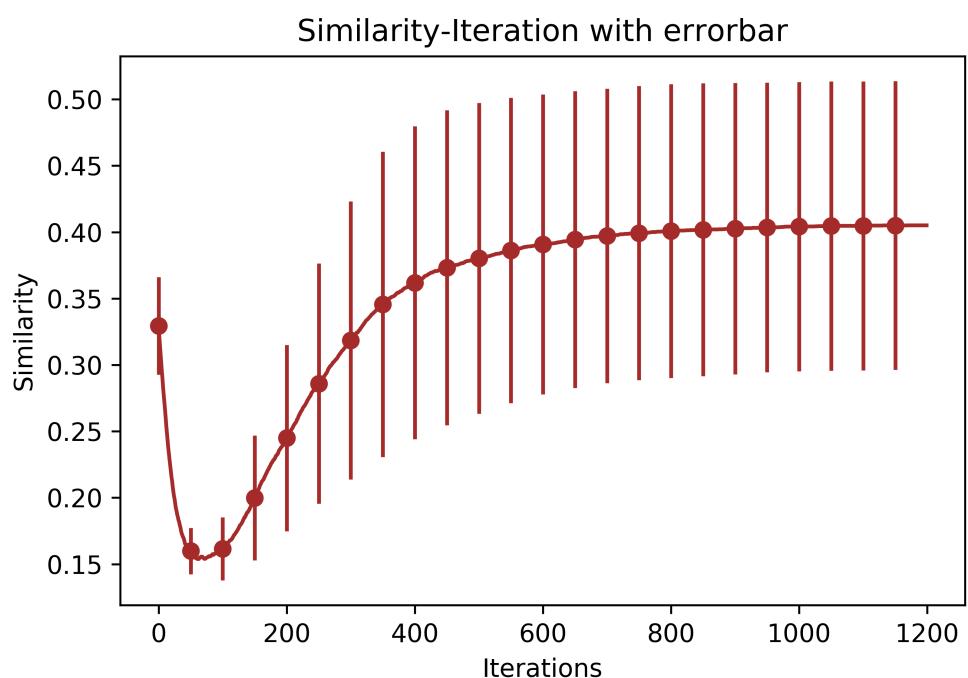


Figure 44: Similarity with error bar

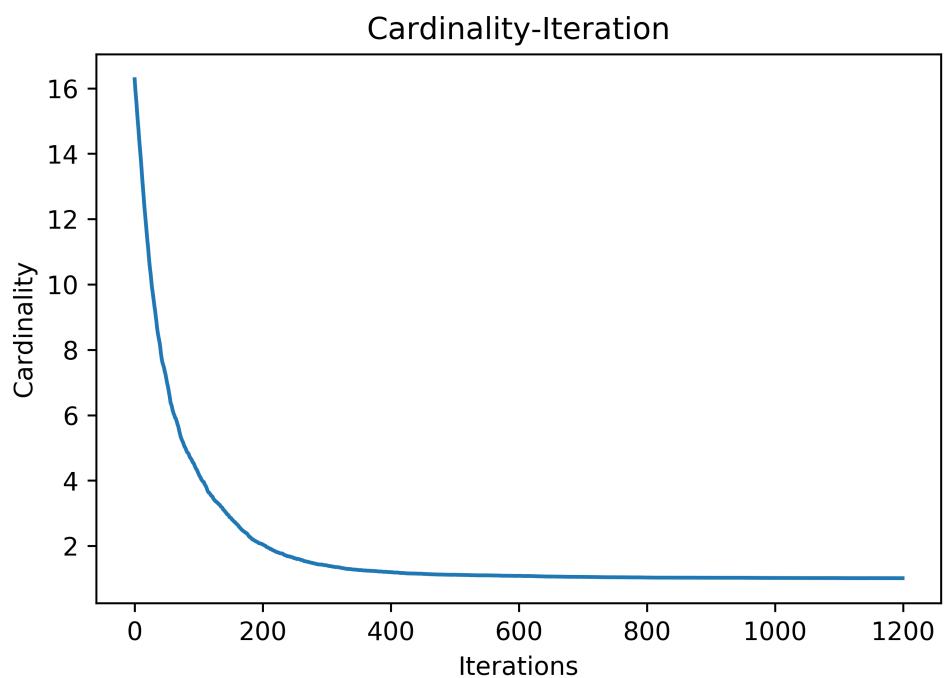


Figure 45: Cardinality

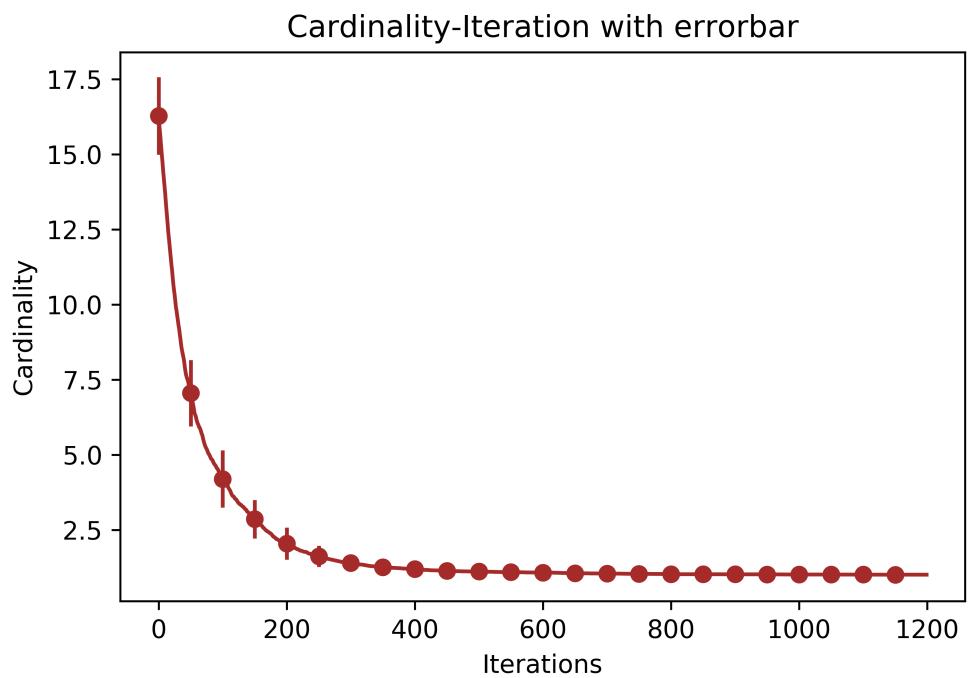


Figure 46: Cardinality with error bar

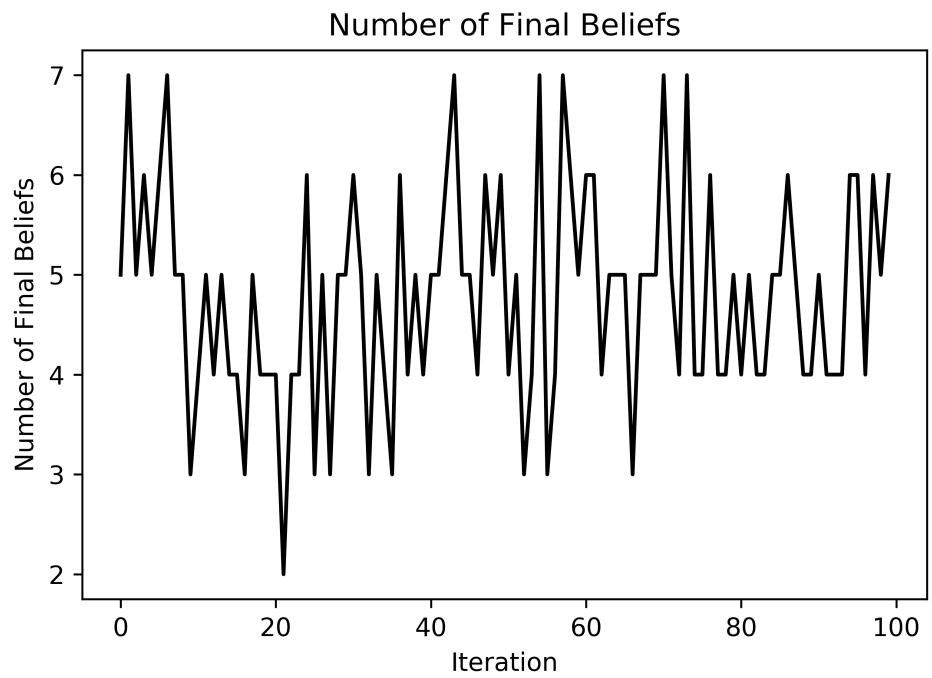


Figure 47: Cardinality with error bar

### 2.3 50\_5\_1200\_100\_0.5

Time used: 104.99307195062624s

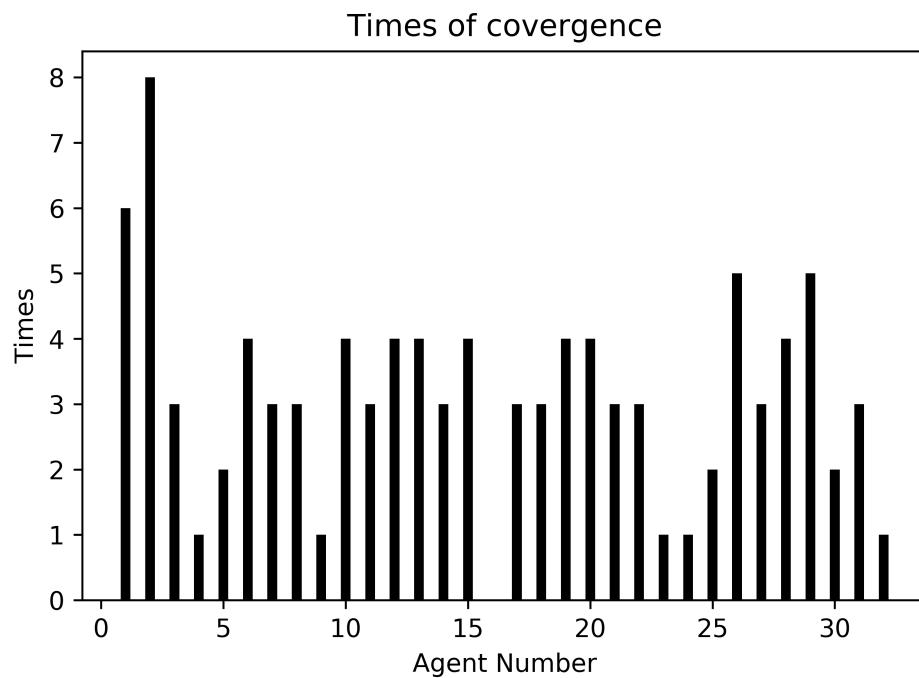


Figure 48: Where the iterations converge

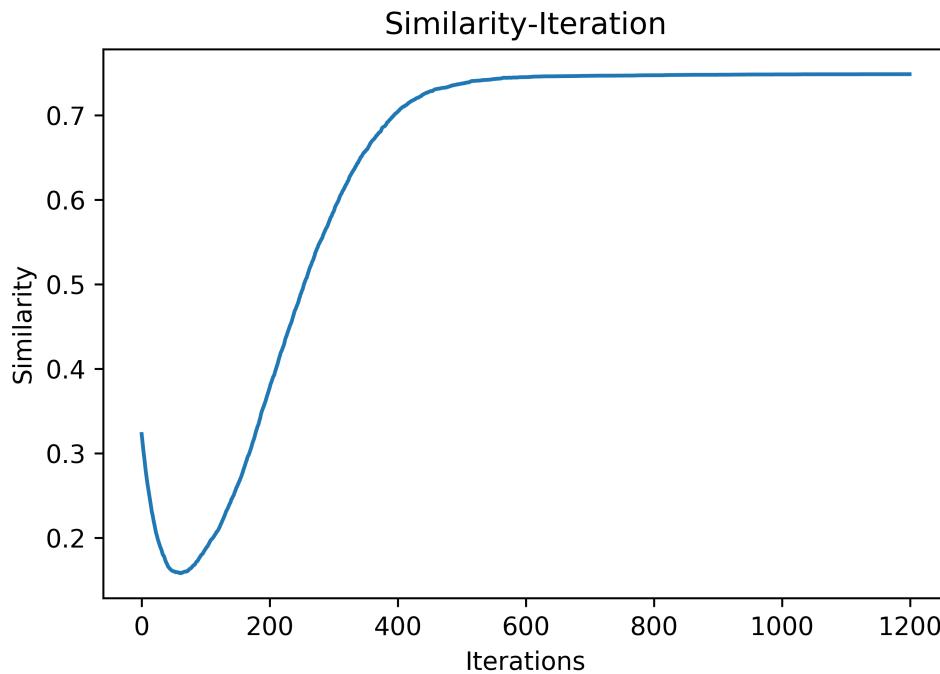


Figure 49: Similarity

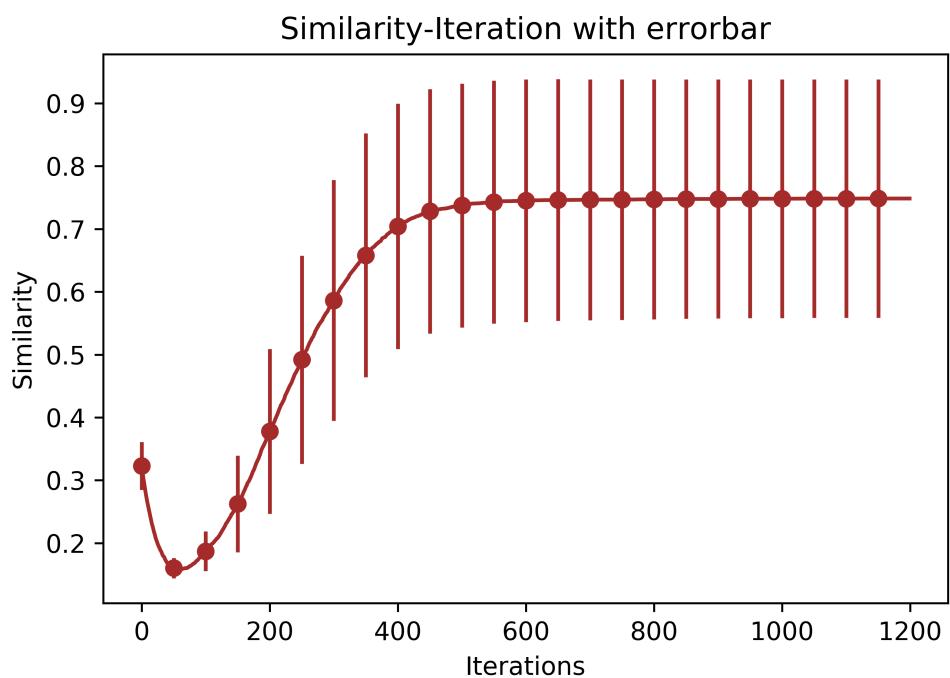


Figure 50: Similarity with error bar

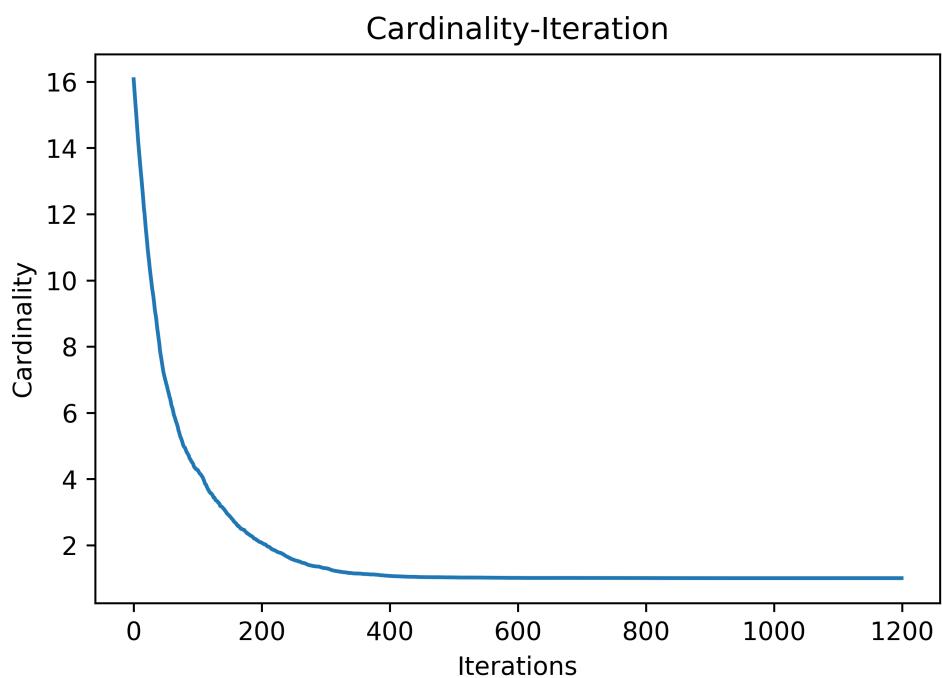


Figure 51: Cardinality

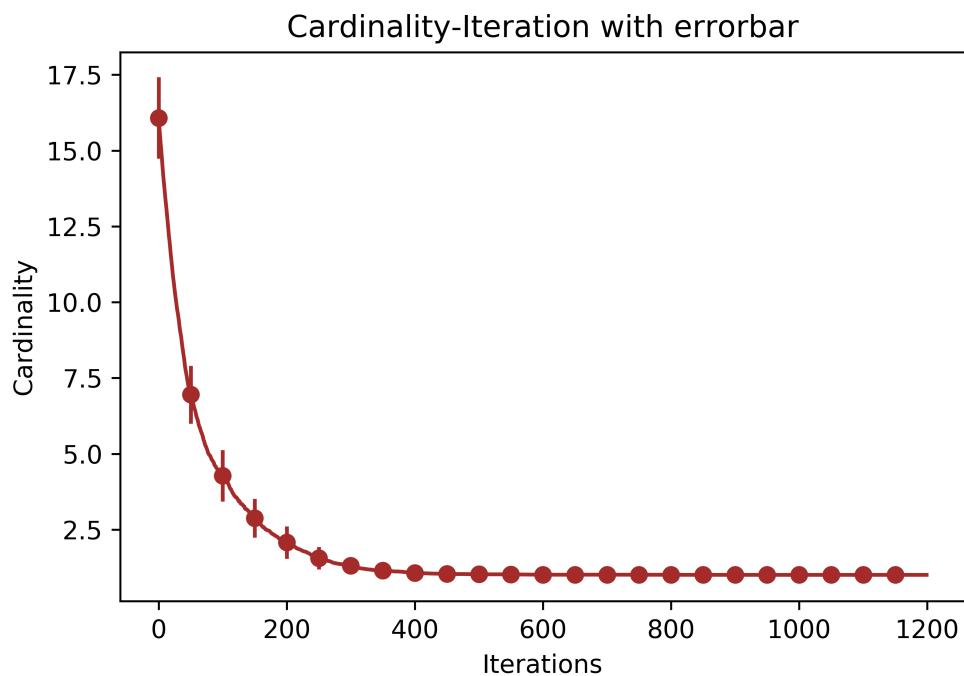


Figure 52: Cardinality with error bar

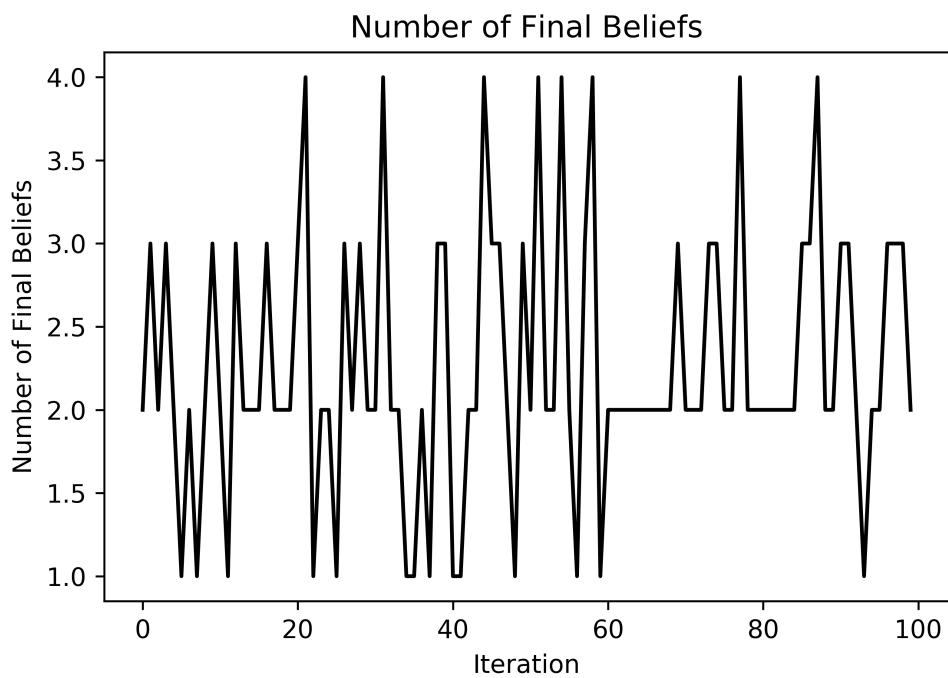


Figure 53: Cardinality with error bar

## 2.4 100\_4\_1500\_100\_0.5

Time used: 547.3942672014223s

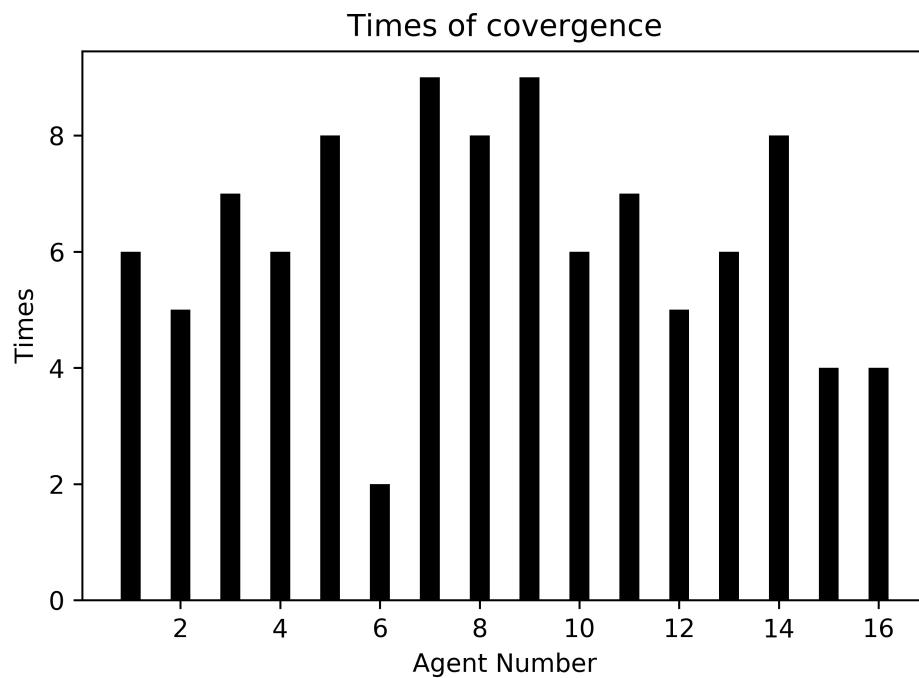


Figure 54: Where the iterations converge

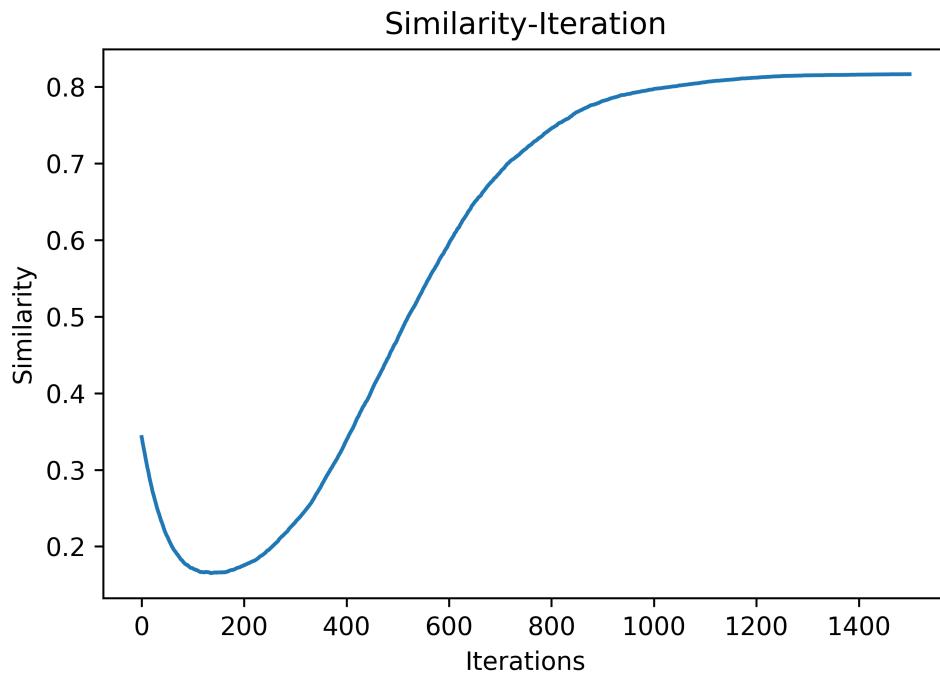


Figure 55: Similarity

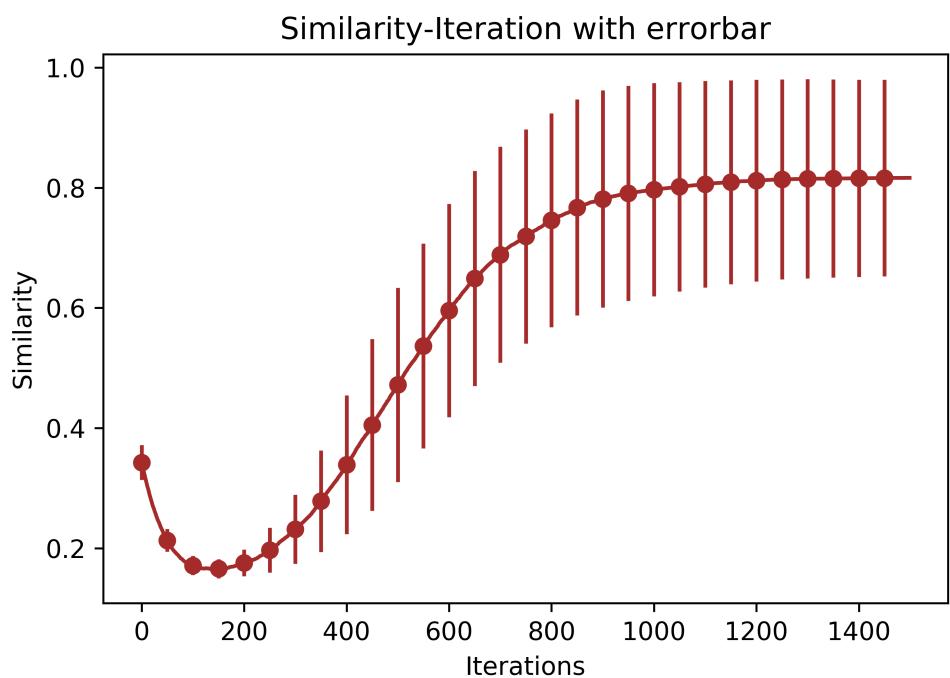


Figure 56: Similarity with error bar

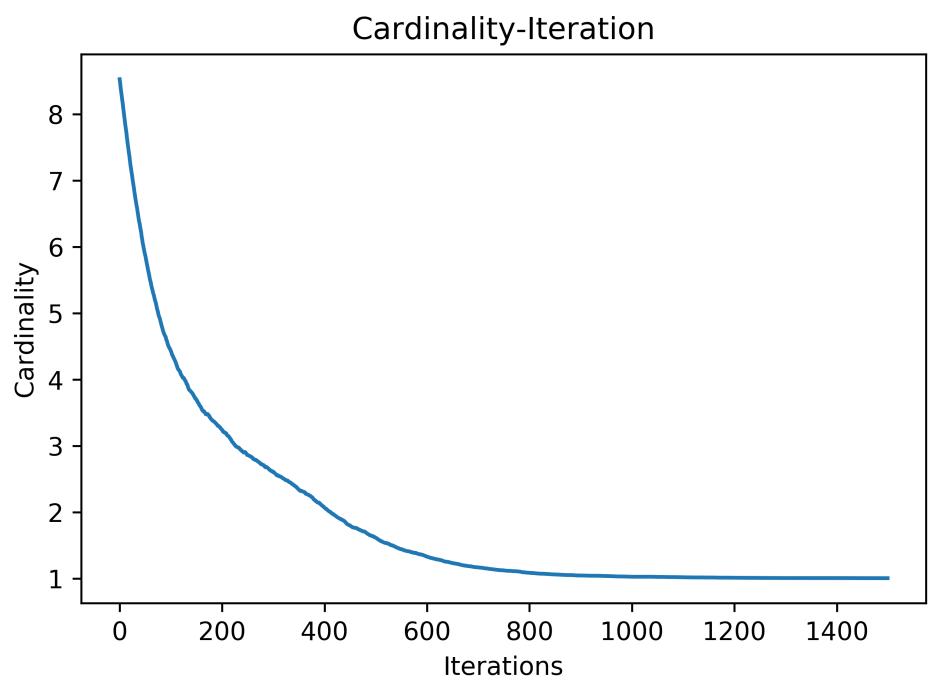


Figure 57: Cardinality

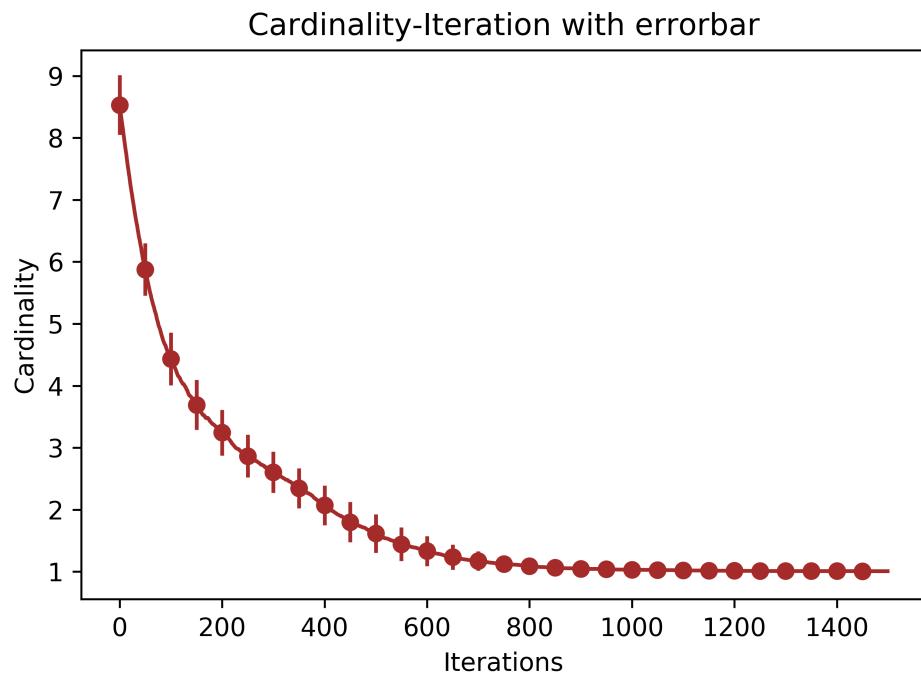


Figure 58: Cardinality with error bar

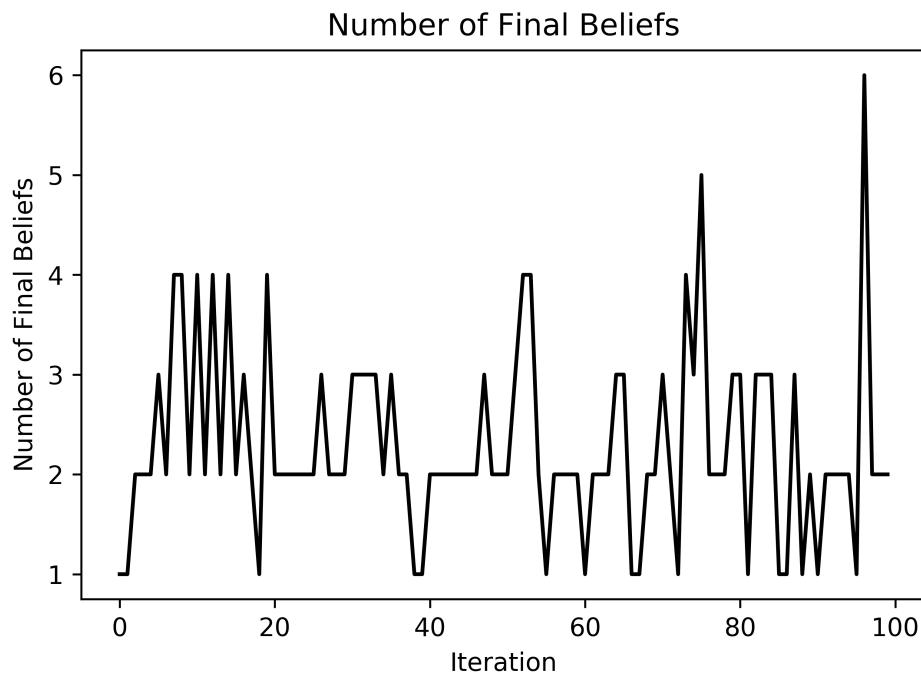


Figure 59: Cardinality with error bar

### 3 Simulation Results with random initialise combine beliefs based on hamming distance(max)

the title: number\_of\_agents\_propositions\_iteration\_Times\_run\_threshold(Hamming distance)

#### 3.1 100\_4\_1500\_100\_0.5

Time used: 113.40667891238468s

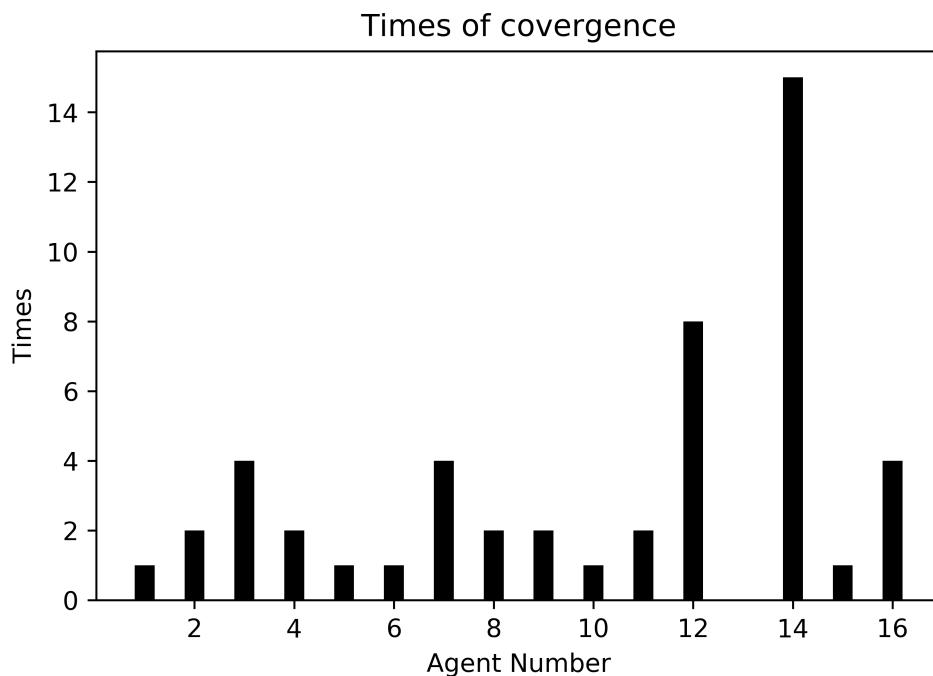


Figure 60: Where the iterations converge

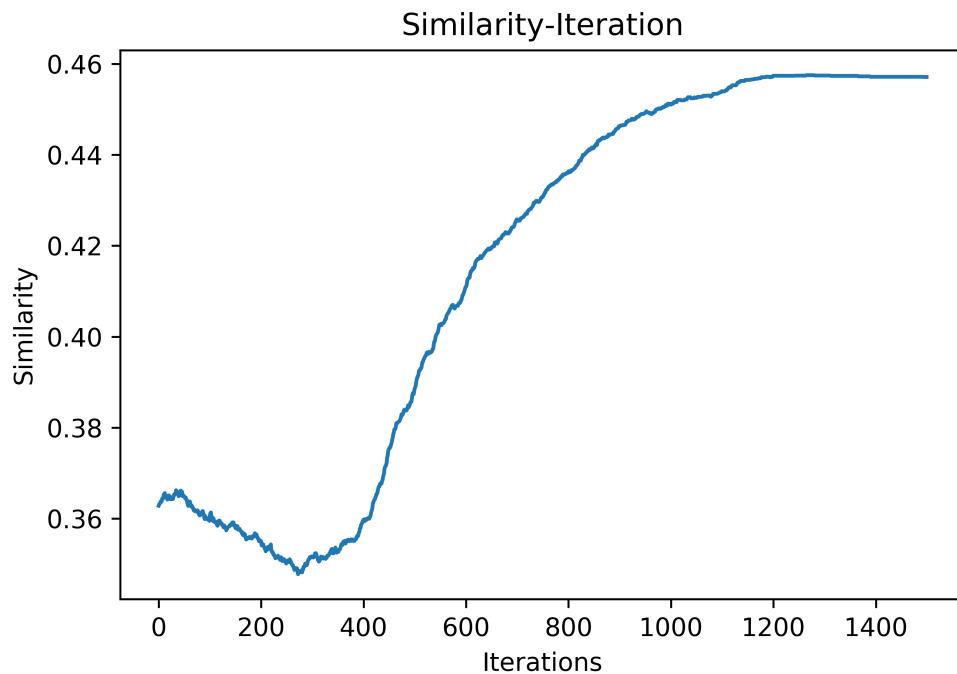


Figure 61: Similarity

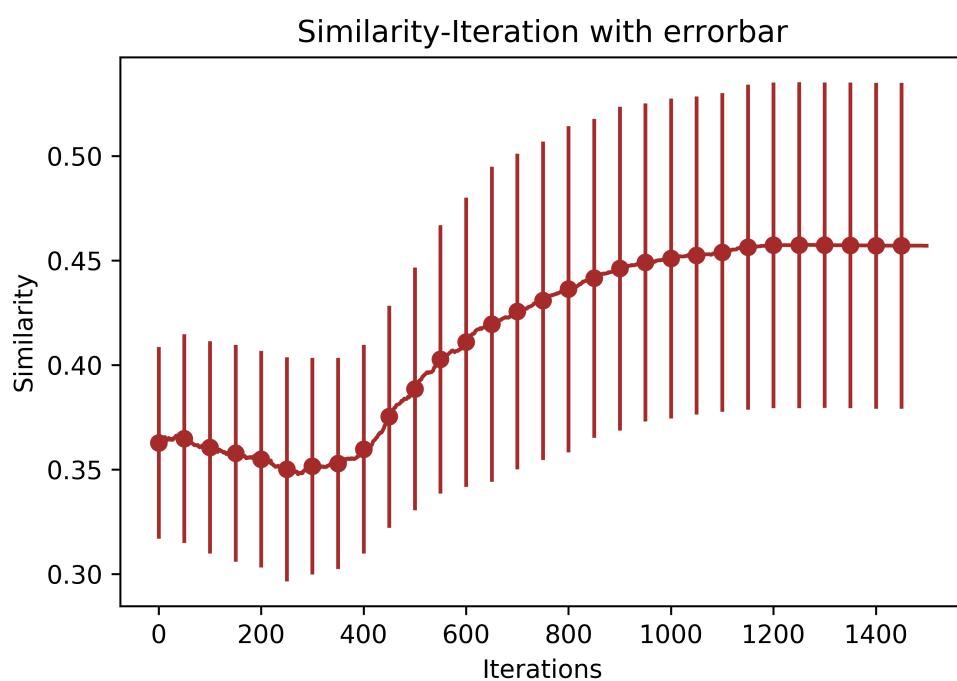


Figure 62: Similarity with error bar

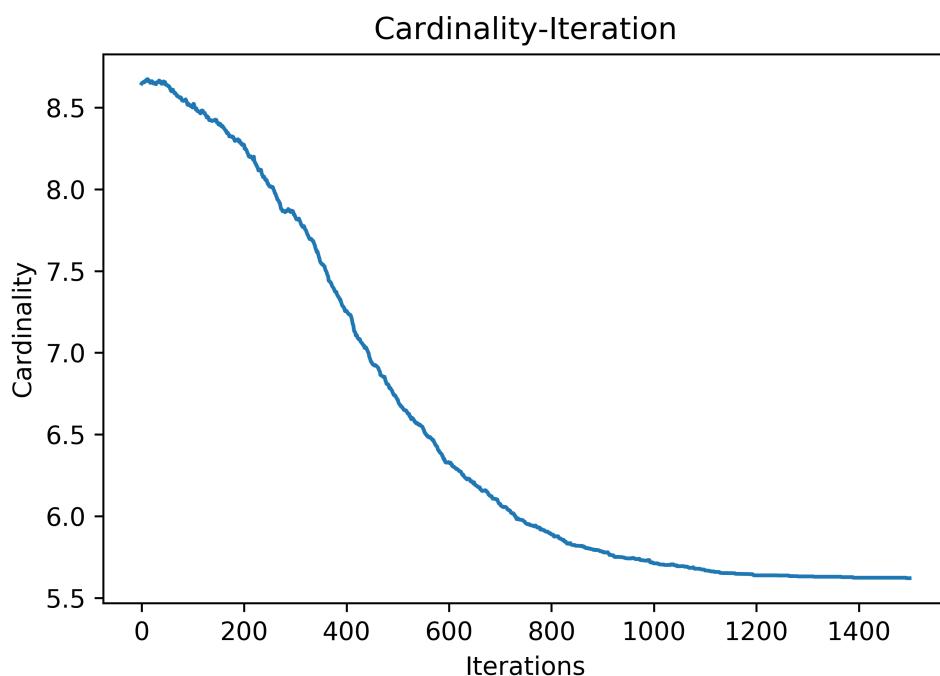


Figure 63: Cardinality

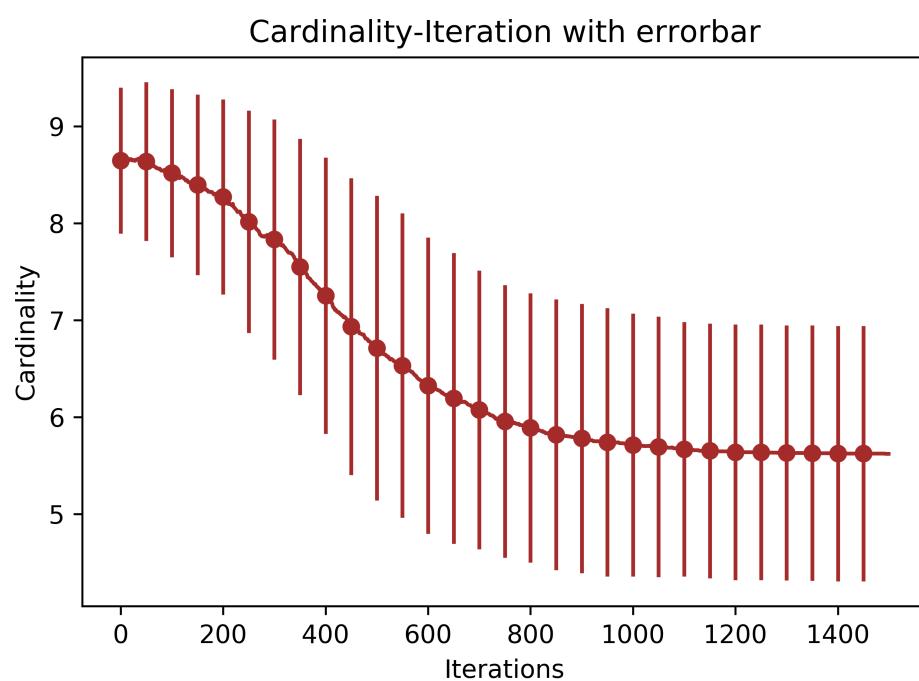


Figure 64: Cardinality with error bar

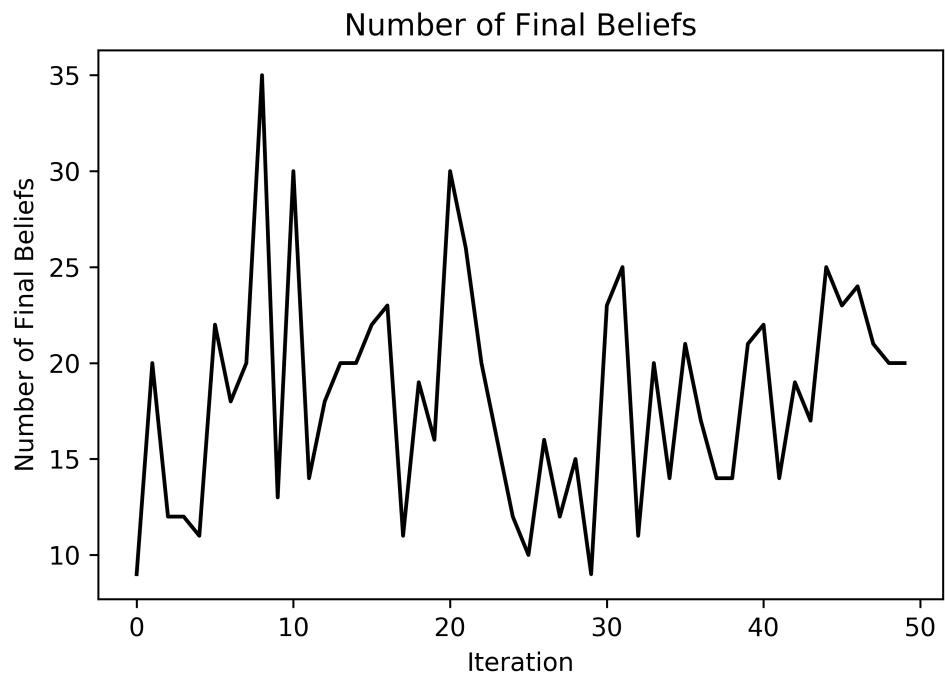


Figure 65: Cardinality with error bar

## 4 Similarity

the title: number of agents\\_propositions\\_iteration\\_Times of run\\_threshold(Similarity)

### 4.1 50\_5\_2000\_100\_0.1

Time used: 141.5855891666033s

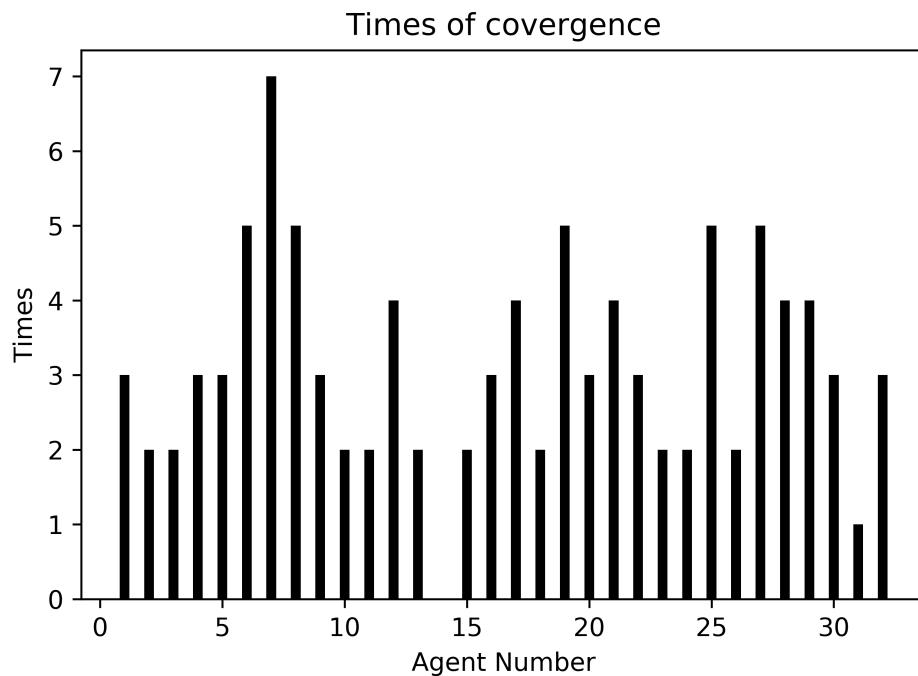


Figure 66: Where the iterations converge

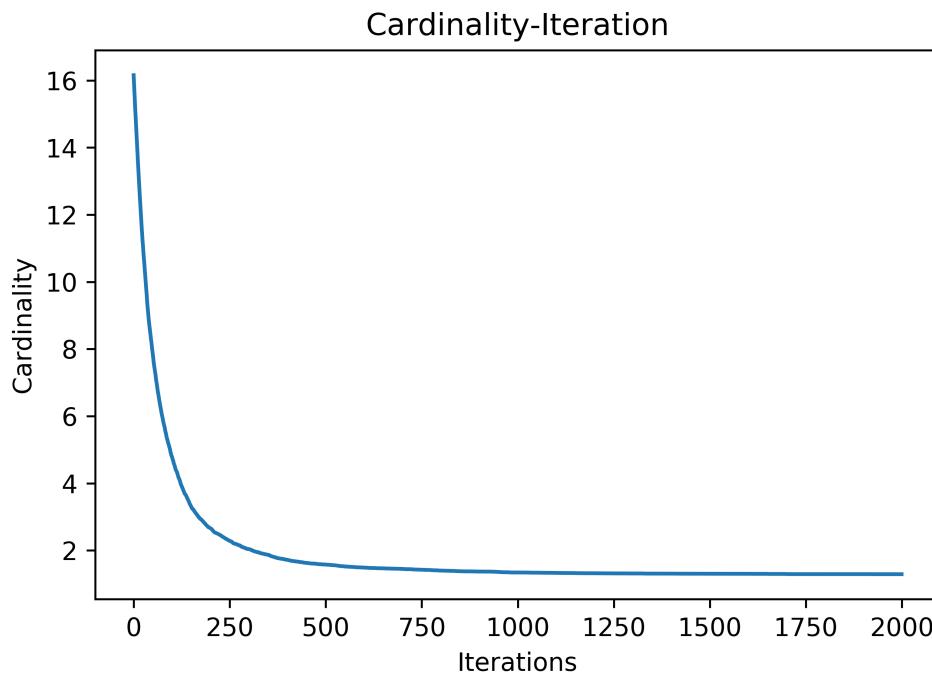


Figure 67: Cardinality

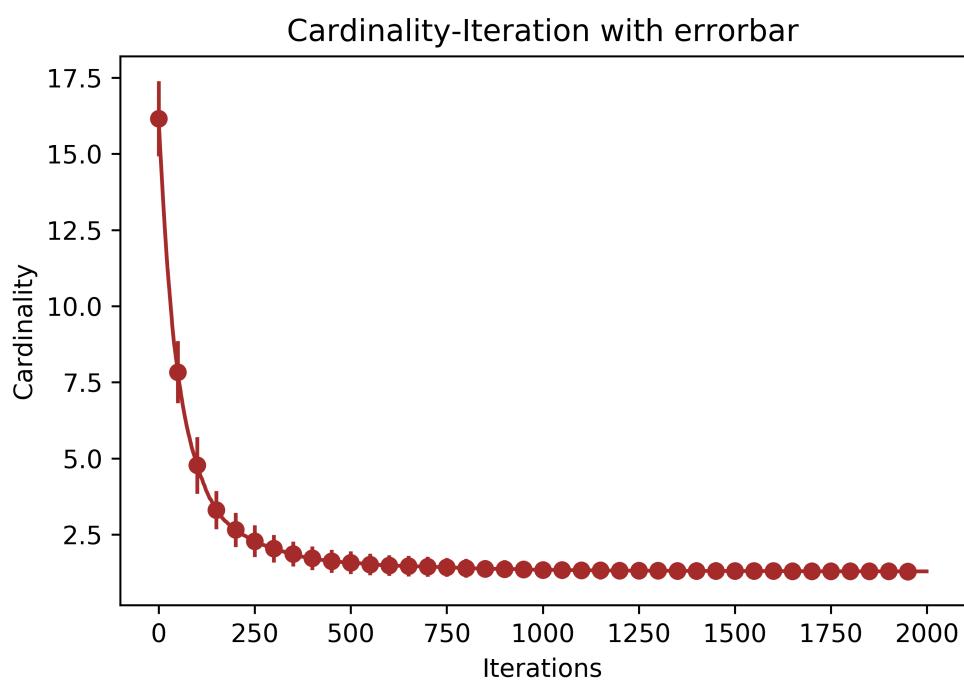


Figure 68: Cardinality with error bar

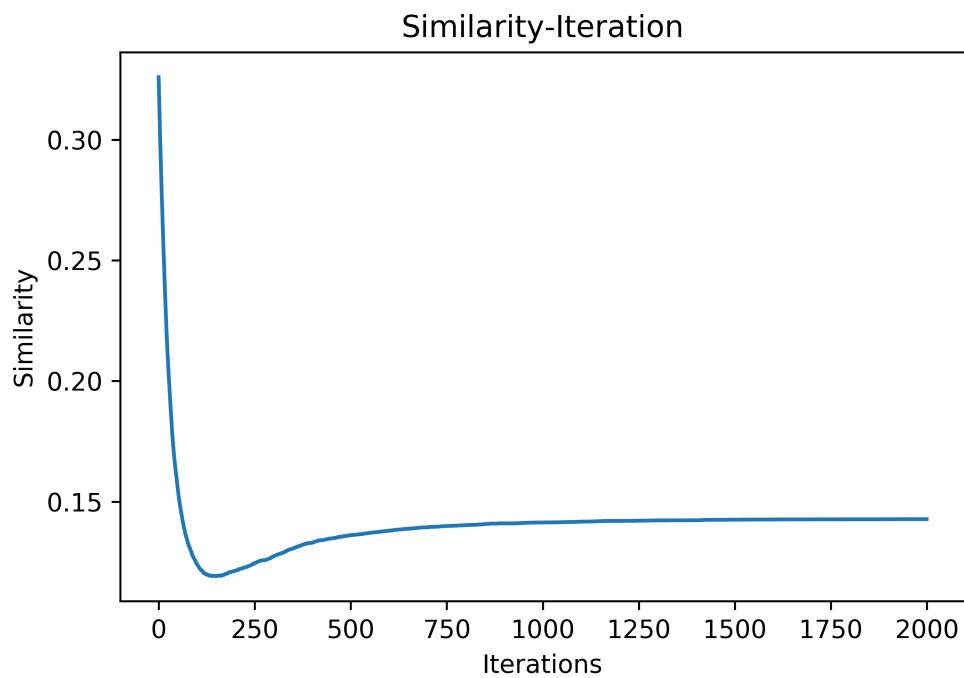


Figure 69: Similarity

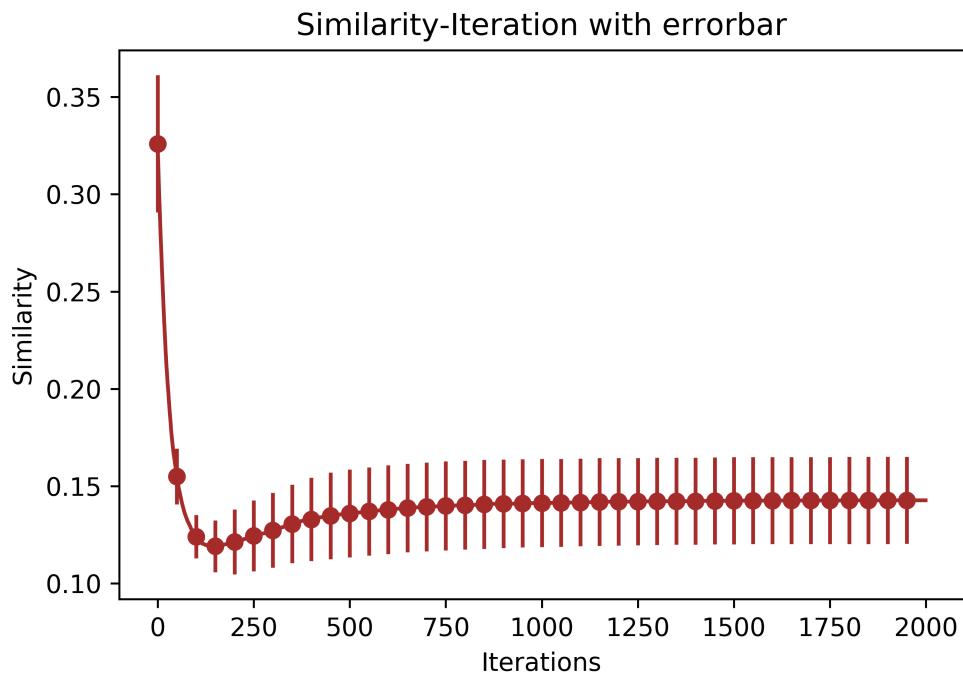


Figure 70: Similarity with error bar

## 5 Threshold Experiments

### 5.1 with min-Hamming distance base

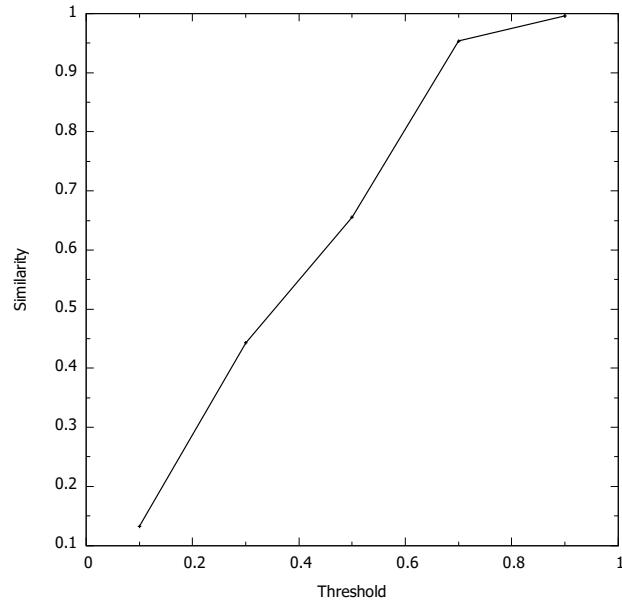


Figure 71: Similarity against threshold.(Experiment condition: 20 times , 50 agents, 5 propositions, 2000 iteration, threshold from 0.1 to 0.9 with 0.2 step) \*similarity problems

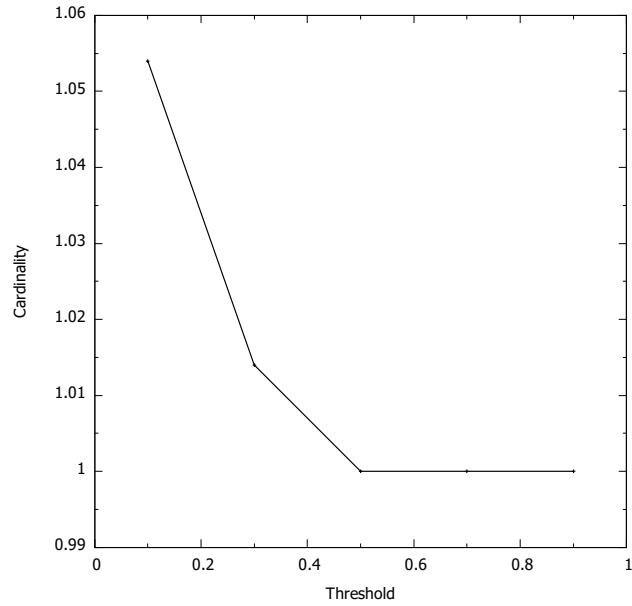


Figure 72: Cardinality against threshold.(Experiment condition: 20 times, 50 agents, 5 propositions, 2000 iteration, threshold from 0.1 to 0.9 with 0.2 step)

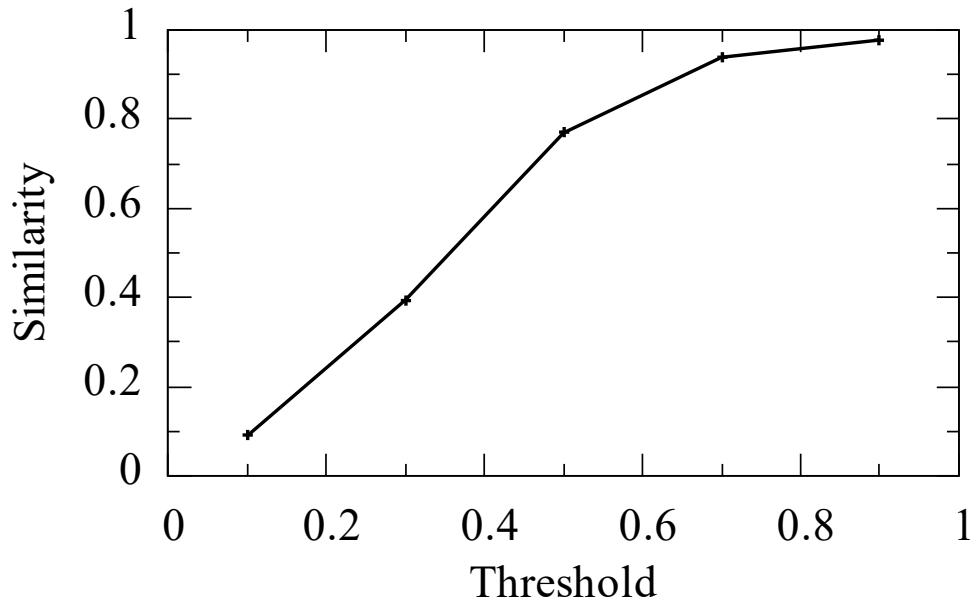


Figure 73: Similarity against threshold.(average of average of 50 times, 100 agents, 5 propositions, 2000 iteration, threshold from 0 to 1 with 0.2 step )\*similarity problems

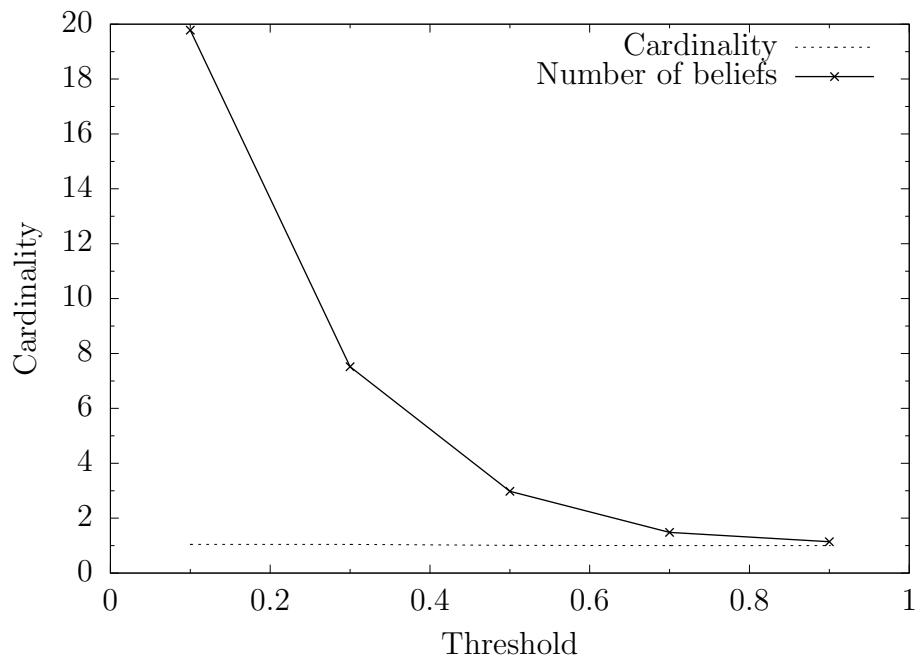


Figure 74: Numbers of belief and cardinality against threshold.(average of average of 50 times, 100 agents, 5 propositions, 2000 iteration, threshold from 0 to 1 with 0.2 step )

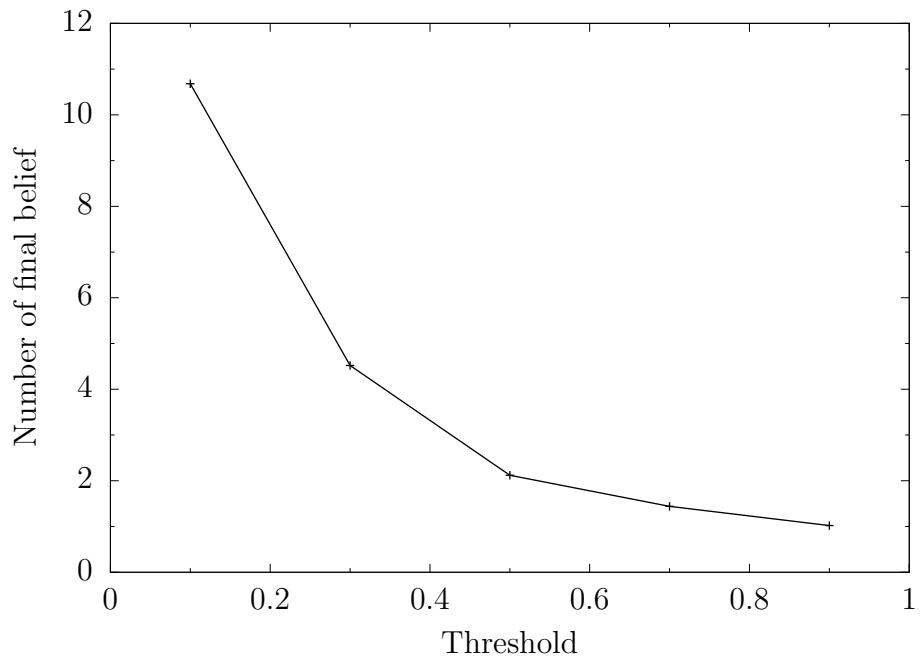


Figure 75: Numbers of belief against threshold.(average of average of 50 times, 50 agents, 5 propositions, 2000 iteration, threshold from 0 to 1 with 0.2 step )

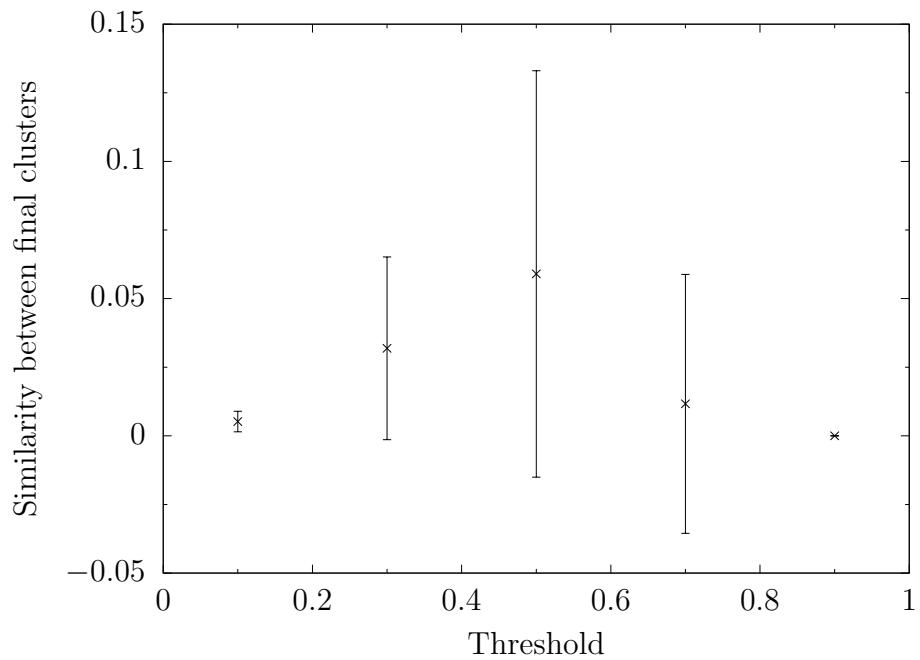


Figure 76: Similarity of different final beliefs against threshold.(average of average of 50 times, 100 agents, 5 propositions, 2000 iteration, threshold from 0 to 1 with 0.2 step)

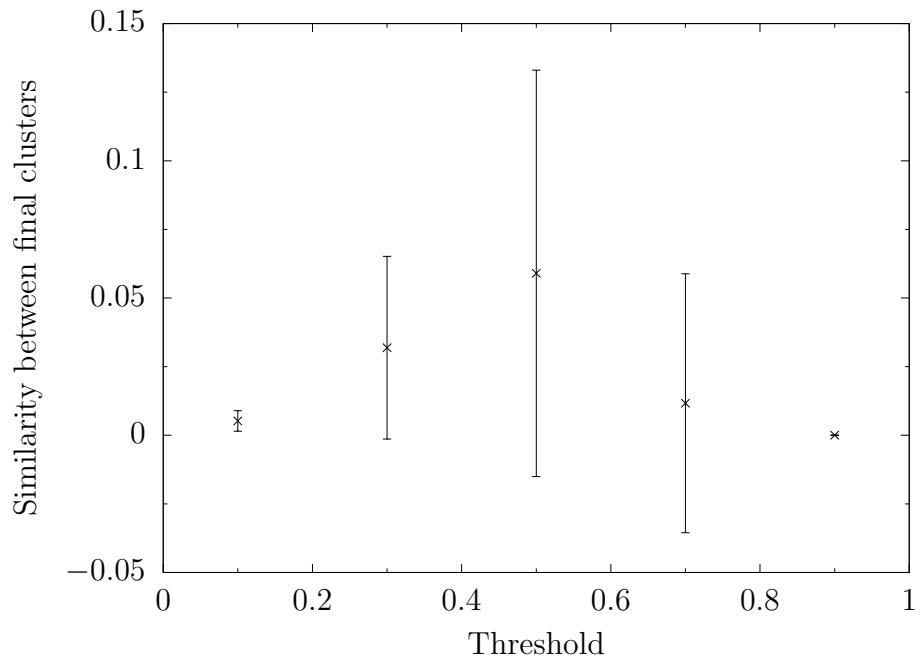


Figure 77: Similarity of different final beliefs against threshold.(ignore singletons)(average of average of 50 times, 100 agents, 5 propositions, 2000 iteration, threshold from 0 to 1 with 0.2 step)

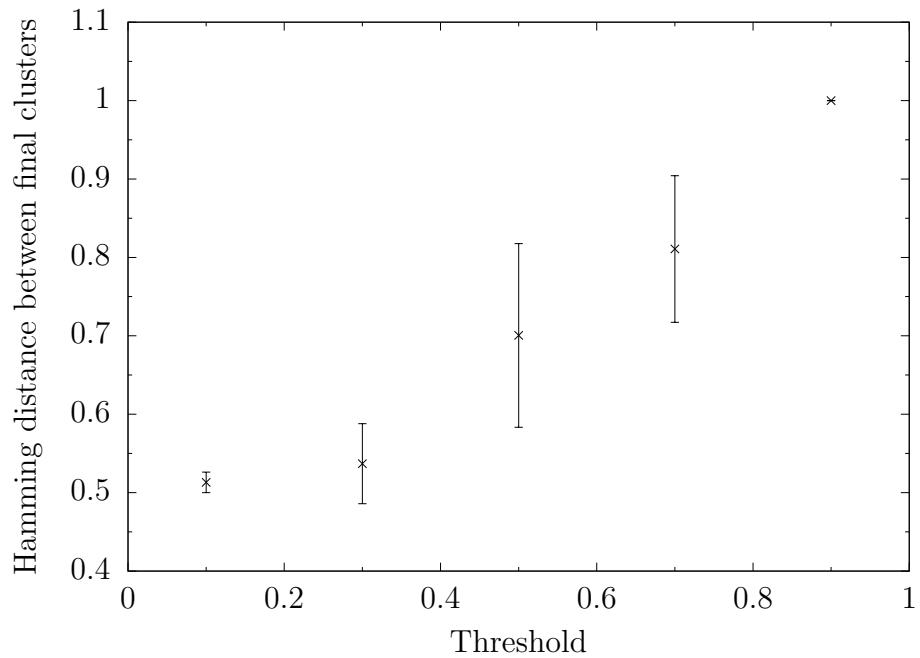


Figure 78: Hamming distance of different final beliefs against threshold.(ignore singletons)(average of average of 50 times, 100 agents, 5 propositions, 2000 iteration, threshold from 0 to 1 with 0.2 step)  
21 June

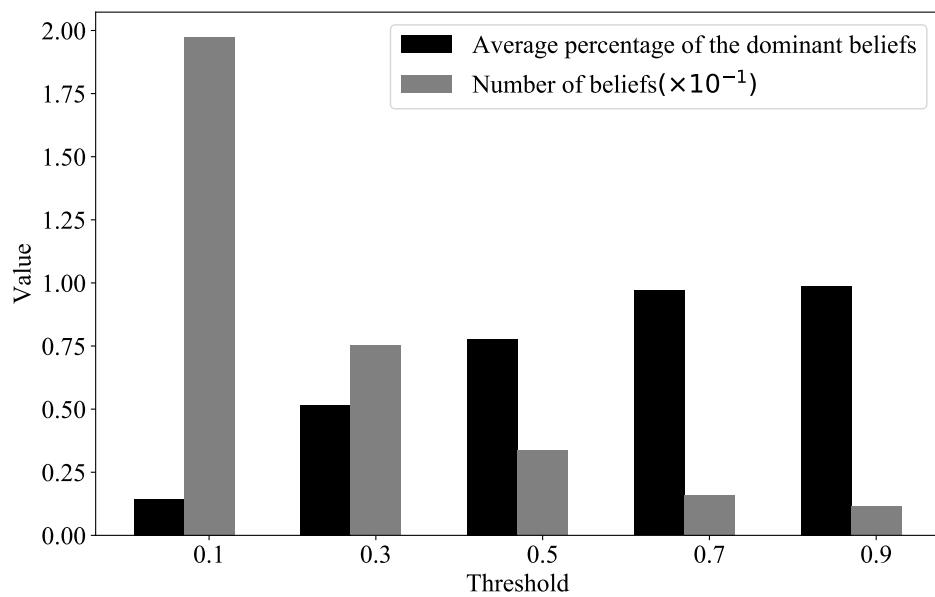


Figure 79: percentage of Dominant beliefs and number of beliefs against threshold.(average of average of 50 times, 100 agents, 5 propositions, 2000 iteration, threshold from 0 to 1 with 0.2 step )

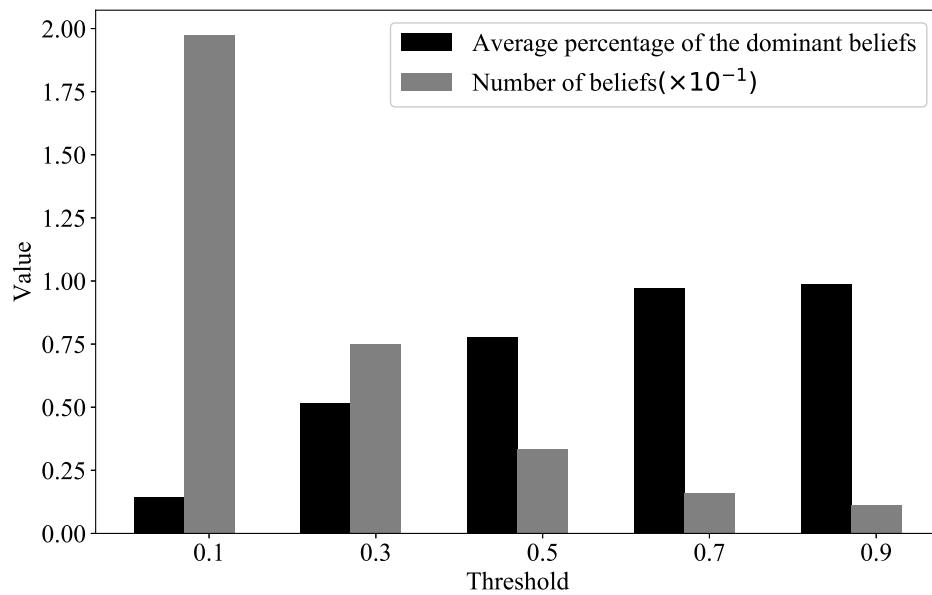


Figure 80: percentage of Dominant beliefs and number of beliefs against threshold.(average of average of 50 times, 100 agents, 5 propositions, 2000 iteration, threshold from 0 to 1 with 0.2 step)

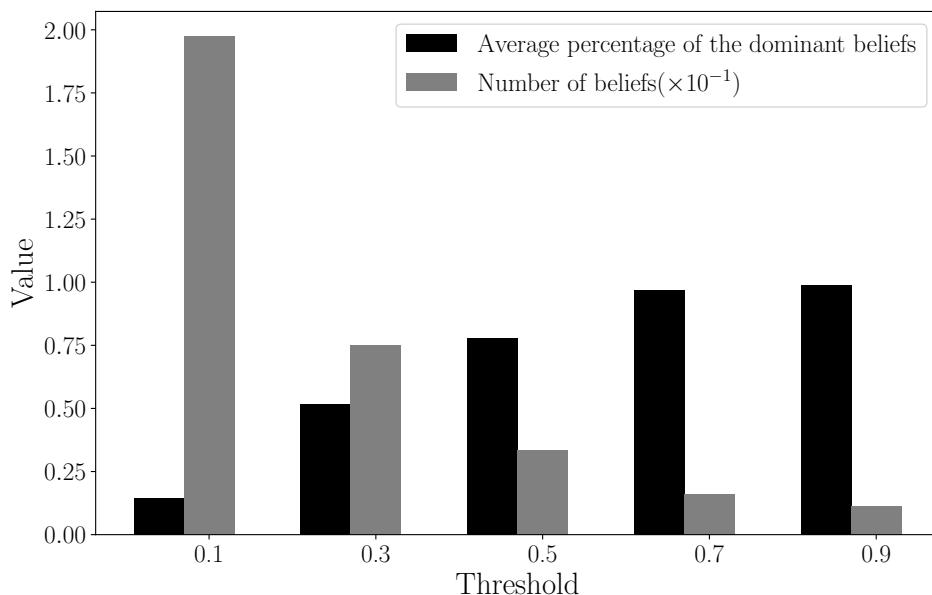


Figure 81: percentage of Dominant beliefs and number of beliefs against threshold.(average of average of 50 times, 100 agents, 5 propositions, 2000 iteration, threshold from 0 to 1 with 0.2 step)

## 5.2 with max-Hamming distance base

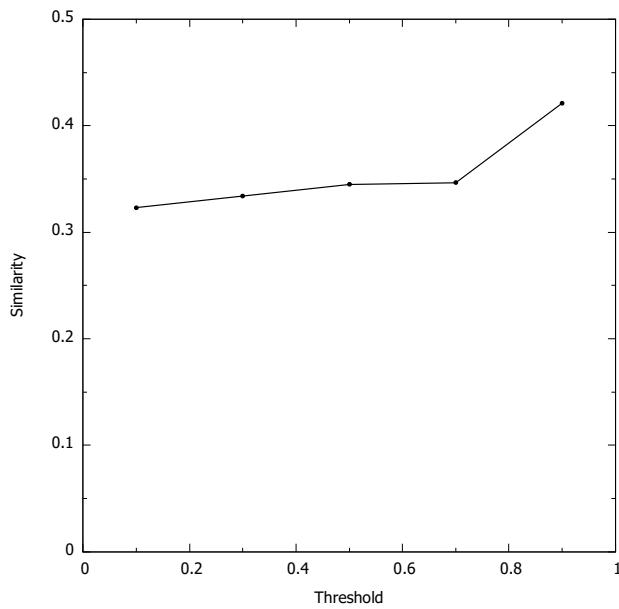


Figure 82: Similarity against threshold.(Experiment condition: average of 20 times, 50 agents, 5 propositions, 2000 iteration, threshold from 0 to 1 with 0.02 step)\*similarity problems

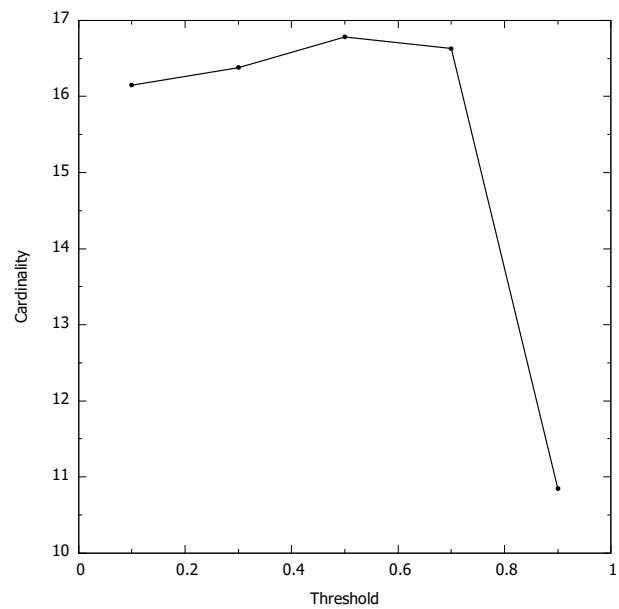


Figure 83: Cardinality against threshold.(Experiment condition: average of 20 times, 50 agents, 5 propositions, 2000 iteration, threshold from 0 to 1 with 0.02 step)

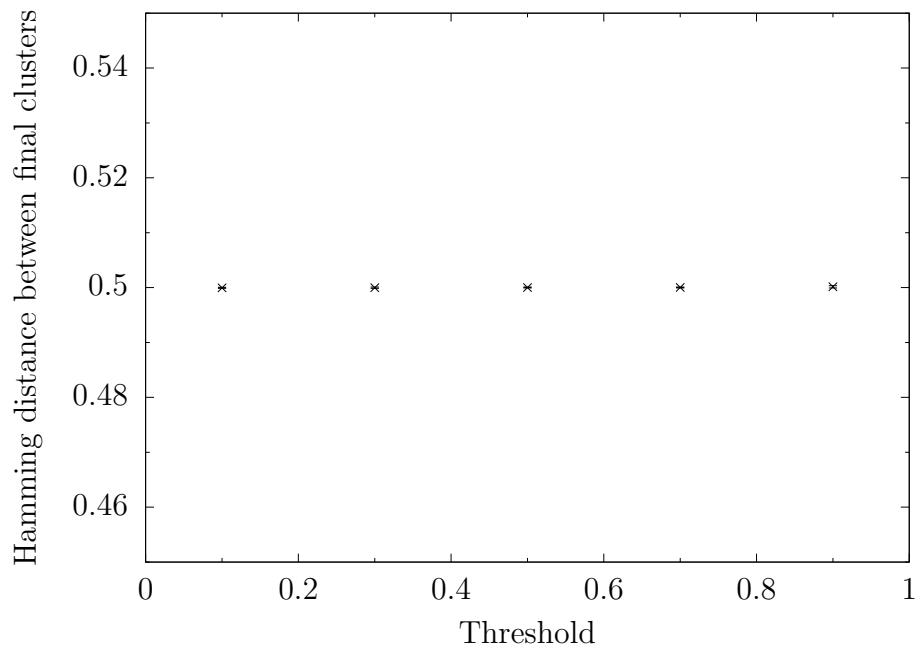


Figure 84: Hamming distance of different final beliefs against threshold.(average of 10 times, 100 agents, 5 propositions, 2000 iteration, threshold from 0 to 1 with 0.2 step **21 June**)

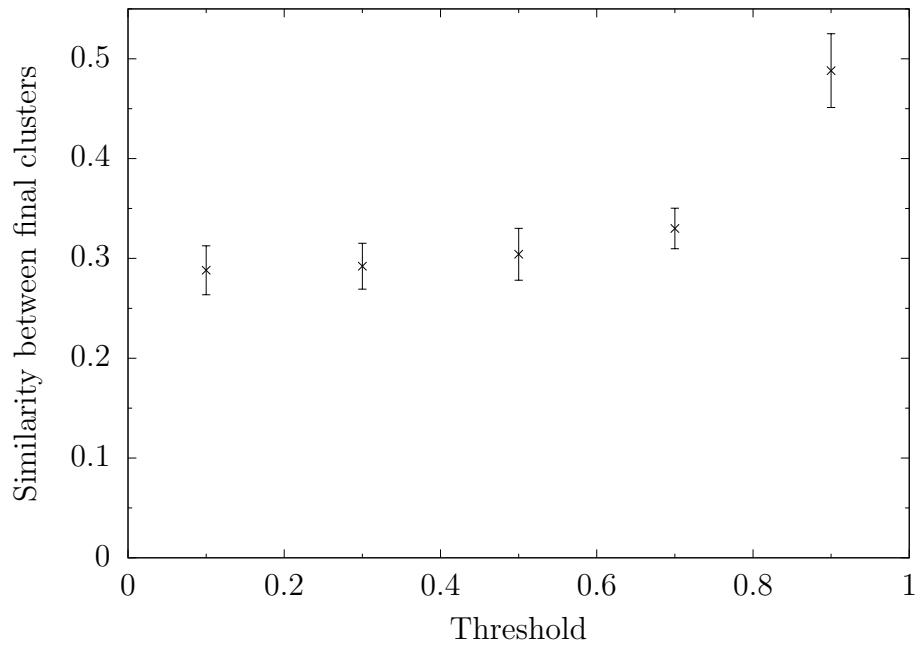


Figure 85: Similarity of different final beliefs against threshold.(average of 10 times, 100 agents, 5 propositions, 2000 iteration, threshold from 0 to 1 with 0.2 step **21 June**)

### 5.3 with Similarity base \*similarity problems

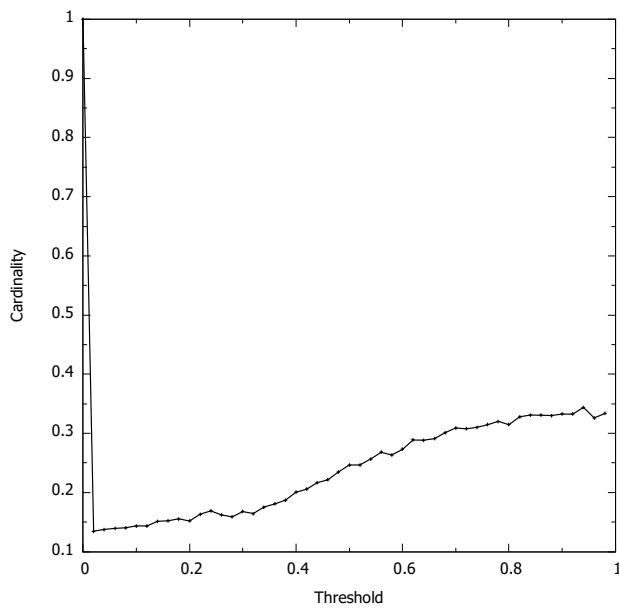


Figure 86: Similarity against threshold.(Experiment condition: average of 50 times, 50 agents, 5 propositions, 2000 iteration, threshold from 0 to 1 with 0.02 step)

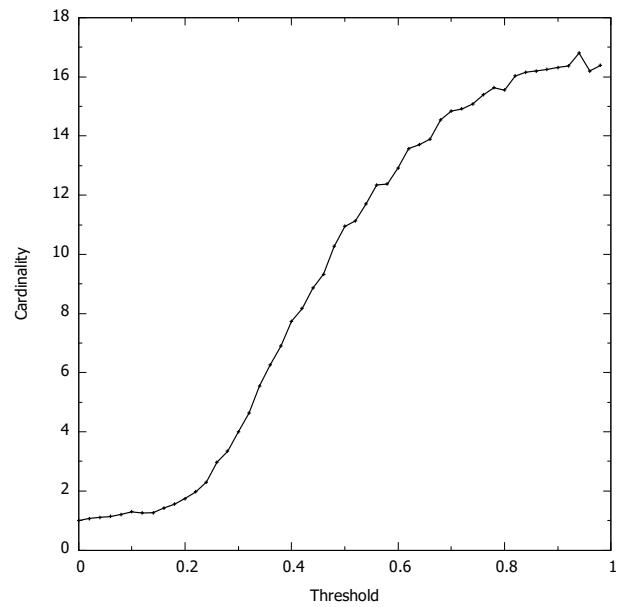


Figure 87: Cardinality against threshold.(Experiment condition: average of 50 times, 50 agents, 5 propositions, 2000 iteration, threshold from 0 to 1 with 0.02 step)