Distributed Algorithms

Implementation of Election in Asynchronous Complete Networks

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TESTS

To guarantee the quality of our implementation we ran multiple test, a summary of those tests is present in Table 1.

For each test we measured a series of parameters to evaluate the output of algorithm. The parameters where:

- **Number of Level Increases:** Sum of the levels of all processes
- **Number of Capture Messages:** Number of capture messages sent by all candidate nodes
- **Number of Captures:** Number of captures that were successful, measured by the ordinary nodes
- **Number of Kill messages:** Number of messages sent by ordinary nodes to kill their previous owner
- **Number of Acknowledgment messages:**
- **Number of Capture/Level Discrepancies:** The difference between the number of captures and number of level increases

Test #	# Machines	Total # Processes	#Level increases	# Captures	# Kills	# Acks	#Capture/Level Discrepancies
1	1	10					
2	2	10					
3	1	10					
4	1	20					
5	1	50					
6	1	100					
7	1	250					
8	1	500					
9	1	1000					

Table 1

As you can see there is a difference between the number

```
[Process: 3]        [C]        Is now a Candidate.
[Process: 4]        [O]        Captured by Candidate Process: 3.
[Process: 2]        [O]        Captured by Candidate Process: 3.
[Process: 1]        [O]        Captured by Candidate Process: 3.
[Process: 5]        [O]        Captured by Candidate Process: 3.
[Process: 3]        [C]        Elected!!
[Process: 1]        [C]        Level = 0.        Times Captured = 1.
[Process: 2]        [C]        Level = 0.        Times Captured = 1.
[Process: 3]        [C]        Level = 5.        Times Captured = 0.
[Process: 4]        [C]        Level = 0.        Times Captured = 1.
[Process: 5]        [C]        Level = 0.        Times Captured = 1.
[INFO]                [ ]        Level Sum = 5.        Captures Sum = 4.
```