CESC 574
Assignment 1: Leader Election

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Due date Oct 2

1 Task

In this assignment you have to implement a leader election protocol on a ring. In a leader election protocol, there is at least one initiator that starts the protocol. The problem is solved when every node chooses the node with the minimum id as the leader.

When a robot becomes the leader, it sets the color of the led as 1 (red=1, green = 1 blue=1), otherwise it sets the color to red. The protocol is executed everytime that a new node joins. In other words, the node that is joining becomes the initiator.

Clockwise Leader Election Protocol

Each node v executes the following code:
1. v sends a $ELECTING(v)$ to its successor.
2. v sets $m := v$ the smallest identifier seen so far
3. **if** v receives a message $ELECTING(w)$
4.   **if** v with $w < m$ **then**
5. v forwards $ELECTING(w)$ to its clockwise neighbor and sets $m := w$
6. v decides not to be the leader, if it has not done so already.
7.   **else if** $w > m$ and v has not been participating **then**
8. v sends message $ELECTING(m)$ to its successor
9.   **else if** $v = w$ **then**
10. v sends message $ELECTED(v)$ to its clockwise neighbor
11. **end if**
12. **if** v receives a message $ELECTED(w)$ with $w \neq v$ then
13. v forwards $ELECTED(w)$ to its clockwise neighbor and sets $leader = w$
14. **end if**