Robot with light sensors X74930_en

We are designing a robot that must move towards a light source. The robot has three photosensors mounted at the front of the robot. The three sensors are separated by angles of 45^o pointing at the left, center and right, respectively. Each sensor has a digital output that is 1 when the sensor receives light and 0 otherwise.
The robot also has two wheels at the right and the left. When the right wheel is powered, the robot turns to the left. Similarly, when the left wheel is powered, the robot turns to the right. If both wheels are powered, the robot is propelled forward.
Since the sensors are separated by 45^o-angles, the left and right sensors can never receive light simultaneously. If the left sensor (LS) detects light, the robot should turn to the left. Similarly, if the right sensor (RS) detects light, the robot should turn to the right. When only the central sensor (CS) receives light, the robot should move forward. When no sensor detects light, the robot should turn to the left trying to find light on the back of the robot[1].
Design a circuit that reads the inputs from the sensors and produces the outputs that activate the right wheel (RW) and the left wheel (LW).

Specification

module *robot*(*RS*, *CS*, *LS*, *RW*, *LW*);
  input *RS*, *CS*, *LS*;
  output *RW*, *LW*;

Input

- *LS*, *CS* and *RS* are the inputs coming from the left, center and right photosensor, respectively.

Output

- *RW* and *LW* are the outputs that activate the right and left wheels, respectively.

Problem information

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[1] Another option could have been to turn right. However, we arbitrarily chose to turn left to avoid any ambiguity in the specification of the problem.