Implementing StateMachines in C – a structured approach

SETR 24/25
Lab work 2

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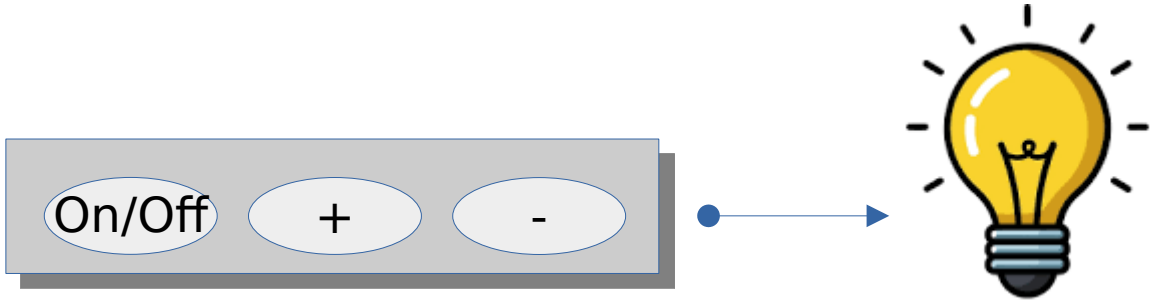
Work description

Goal:

- Implement a state machine to control the intensity of a lamp, using a structured approach and the C language.
- The lamp can be turned on or off, and while on can be set to 5 levels of intensity (1...5).
- The lamp is controlled by a command with 3 buttons: “on/off”, ‘+’ and ‘-’. The “on/off” button toggles the on/off state of the lamp. The buttons ‘+’ and ‘-’ increase/decrease the intensity, respectively.



Work description

Work to carry out:

1. Draw the state machine
2. Analyze the code provided
3. Implement the code necessary to support all the transitions.
4. Implement an event queue (in the code there is no queue – just one event is stored)
5. Extend the machine with further functionality. E.g.:
    1. A “M”ax button to turn the lamp on with the maximum intensity
    2. A timeout function that turns the lamp off automatically after a given time without interaction