Design Name : A design that involves timers

Objective :

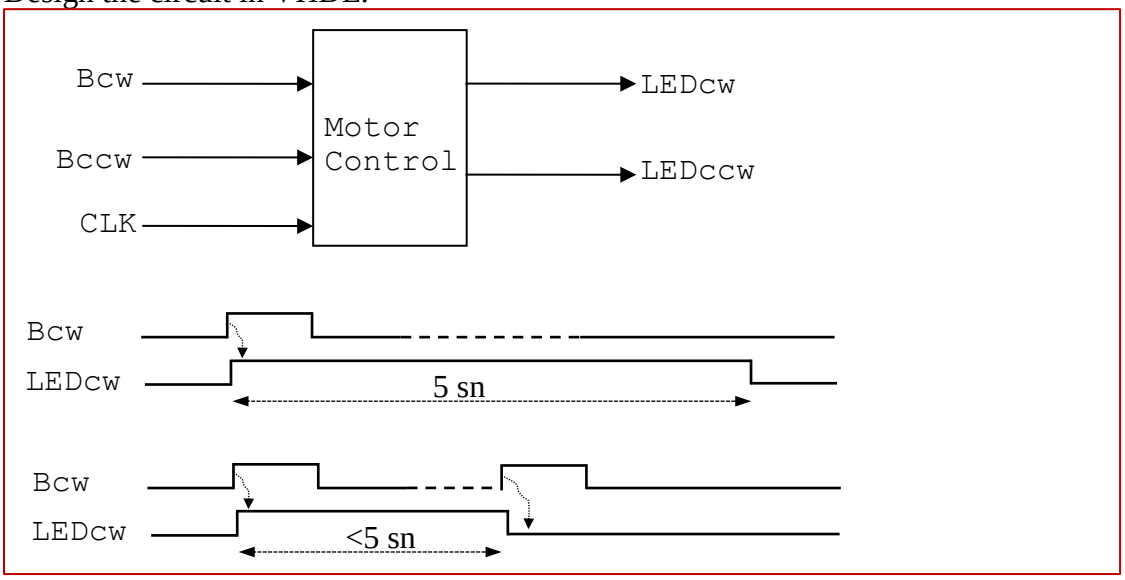
Understand the requirements of a given problem and code the planned control flow.

Assignment 1:

Problem:

A simple motor control (on-off) is sought. Two buttons control the direction of the motor. Let us call them Bcw and Bccw. Pressing and releasing (independent of the hold duration) Bcw once, the motor is activated and rotates clockwise for 5 seconds, then stops. CW rotation is represented by a LED. Bccw button does a similar thing but for counterclockwise rotation and for 3 seconds. It is also represented by another LED. When any button is pressed during the motors rotation, the motor immediately stops and waits for another button press.

Design the circuit in VHDL.



An example key-debouncer module is given with this sheet (if needed);

```
entity KDB is port(
  CLK : in  STD_LOGIC;
  Kin : in  STD_LOGIC;
  Kout: out STD_LOGIC);
end KDB;
```

You need to design your own timing approach.

Assignment 2:

Assume that the motor activates a linear movement and two ends are checked by two limit-switches ; Scw and Sccw. That is, for example, if the movement limit is reached before the motor stops automatically by the timer, the corresponding switch is turned on. Change your design to incorporate these two switch inputs.

Remember that when a switch is on, it must not allow the rotation in the same direction. But the rotation in the opposite direction should be allowed.