CDA 4253/EEL 4935 FPGA System Design
Assignment #4

1   Description

Design a count-down timer with preset time with the following requirements.

1. Use the 7-segment display to show the remaining time `MM.SS` where `MM` are minutes and `SS` are seconds.

2. Use switches `sw15 - sw8` to set time in minutes. The number set by these switches is a 2 digit BCD number.

3. Use switches `sw7 - sw0` to set time in seconds. The number set by these switches is a 2 digit BCD number.

4. The range of minutes and seconds is from 0 to 59. If the inputs from switches are larger than 59, then those inputs should be treated as 59.

5. Use the button `BTNC` to reset the circuit.

6. Upon power-up/reset, the circuit reads the preset time from the switches and show it on the display. All LEDs light off.

7. When time is up where the display shows `00.00`, all LEDs should light on.

8. Make additional adjustment if necessary.

Note: This design requires a clock divider that can produce ticks with a period of one second. To know how to implement such a clock divider, study the `Stopwatch` *example in section 4.5.2 in Chu's book.*

Design that does not work correctly on Basys3 FPGA boards will get no more than 70/100 points.

2   Requirements

1. Create a folder `hw4-your-name` for this assignment, which holds design project files.

2. Create a README file to explain your work if necessary.

3. To submit, zip the entire folder `hw4-your-name`, and upload `hw4-your-name.zip` file to Canvas.

   Note: Make sure that your zipped file is in the ZIP format to avoid any potential issues in opening your files.

   Note: Make sure that you copy all necessary files into the projects.

4. *Make sure that you do NOT modify your work before the HW grading is finished in case that your original work needs to be examined.*