IZMIR KATIP CELEBI UNIVERSITY
DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING
EEE458 MICROELECTRONIC CIRCUITS
MID-TERM EXAM OF 2019-2020 SPRING

Design an FPGA-based circuit using VHDL to satisfy following rules:

* There is one LED. Normally, it gives no light.

* There are three buttons: Player1, Player2, and StartStop.

* There are three switches to encode the time: **000:** 1 minute, **001:** 3 minutes, **010:** 5 minutes, **011:** 10 minutes, **100:** 15 minutes, **101:** 30 minutes, **110:** 60 minutes, **111:** 90 minutes.

* There are two switches to encode the additional time: **00:** 0 seconds, **01:** 2 seconds, **10:** 3 seconds, **11:** 5 seconds.

* There are two displays where 4 digits for each. Each display shows the remaining time in minutes (2 digits) and seconds (2 digits) for the corresponding player.

* When the button of StartStop is pressed, the device will start if it is stopped (and both timers will stop), or the device will stop if it is started.

* When the device is started as the first time, the time of the Player1 will start to decrease.

* When the button of Player1 is pressed, the time of the Player1 is stopped but the time of the Player2 will start to decrease.

* When the button of Player2 is pressed, the time of the Player2 is stopped but the time of the Player1 will start to decrease.

* If one of the timers reaches the zero, then buttons of Player1 and Player2 will not work anymore. In addition, the LED will give light.

* When the button of Player1 is pressed, the timer of the Player1 will increase by the pre-configured additional time.

* When the button of Player2 is pressed, similarly, the timer of the Player2 will increase by the pre-configured additional time.

* Use the system clock as 50 MHz.

* You should implement the module itself with a separate top module, simulate your answer as a video. Finally, please upload your answer as a single zip file including VHDL codes and the video file until 23:59 on June 10, 2020. ☺

GOOD LUCK !!!