OSES Final Assignment

Assignment

A tunable lamp shall be developed capable of varying the color and the intensity of the emitted light.

1. The S32K144 evaluation board shall be used for implementing the lamp;
2. The Micrium µC/OS3 operating system shall be used;
3. The S32K144 RGB led shall be used for implementing the lamp;
4. The S32K144 potentiometer shall be used for varying the lamp intensity;
5. The S32K144 SW2 and SW3 user buttons shall be used for changing the lamp color;

The lamp operates as follows:

1. At the start-up the RED color is selected, with an intensity proportional to the potentiometer position. When the potentiometer output is 0V, the RGB is activated by a 10 KHz PWM signal with 0% duty cycle (i.e., the led is always OFF); when the potentiometer output is 5V, the RGB is activated by a 10 KHz PWM signal with 100% duty cycle (i.e., the led is always ON). When the potentiometer output is between 0V and 5V, the RGB is activated by a 10 KHz PWM signal whose duty cycle is proportional to the potentiometer output;
2. Each time SW2 is pressed, the selected color is changed. The sequence in RED→GREEN→BLUE→RED.
3. Each time SW3 is pressed, the selected color is changed. The sequence is RED→BLUE→GREEN→RED.
4. If any of the button (SW2/SW3) remains pressed, the color shall not change.

Constraints

1. The assignment is composed of:
    a. Zip file containing the S32DS Micrium µC/OS3 project you developed;
    b. 2-pages pdf file with a report describing the solution you implemented (describe which resources, e.g., timers, interrupts, …, you used). The report shall have a cover page with the name and ID number of the students who authored the project.
2. The Zip and pdf files must by uploaded through portale della didattica by January, 17th, 2020 17:30.
3. Zip file and pdf must be provided. No ARJ, RAR, doc, odt, or other file format would be allowed.
4. If you do not comply to the file format convention, and to the deadline, your assignment will be evaluated 0 points.
5. The assignment shall be developed in teams of up to 2 persons.