Brightness control of LEDs

Components

FeqGen1Hz :
In this code , the frequency of 100 MHz clock is changed to 1 Hz. According to this code the frequency of the given clock is divided by 2 × count.
In this case count= 50×10^6

FeqGen1kHz :
Code is same as FeqGen1Hz except for the fact that here count is 50,000.

m**ultiplexer2_1 :**
The multiplexer here has an input "mode".When mode = 0 then the given system is manually controlled and when it is 1 then it will show cycles of brightness from 0 to 15. The output of the multiplexer2_1 will give the brightness level in binary digits.

Upcounter :
The code gives the functioning of a normal counter which again returns 0 after 15 means it will travel from 0-15 then again repeat the same cycle.

PWM :
Pulse With Modulation
In this the code alters the duty cycle of the signal. A duty cycle is the fraction of one period in which the signal or system is active.
The total time of a cycle is represented as T, and it is divided by 16 and will have 16 counters which refer to all parts from 0 to 15.
The value to clock cycle will be 1 for the time the counter traverses from 0 to decimal value of output of multiplexer. And this clock with a modified duty cycle is transferred to all the 16 LEDs.

MAIN:
This main circuit will combine all the components together and will produce a

brightness control circuit of the LEDs . The input of this main circuit are a 100 MHz clock, a 4-bit input and mode.
The output is the brightness level to the LEDs and the anode on which the cathodes will show the variation of the brightness levels.

LIMITATIONS:
when the brightness level goes to the higher values then we can’t recognize the change in two consecutive brightness levels precisely.

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