COL215: LAB ASSIGNMENT 4
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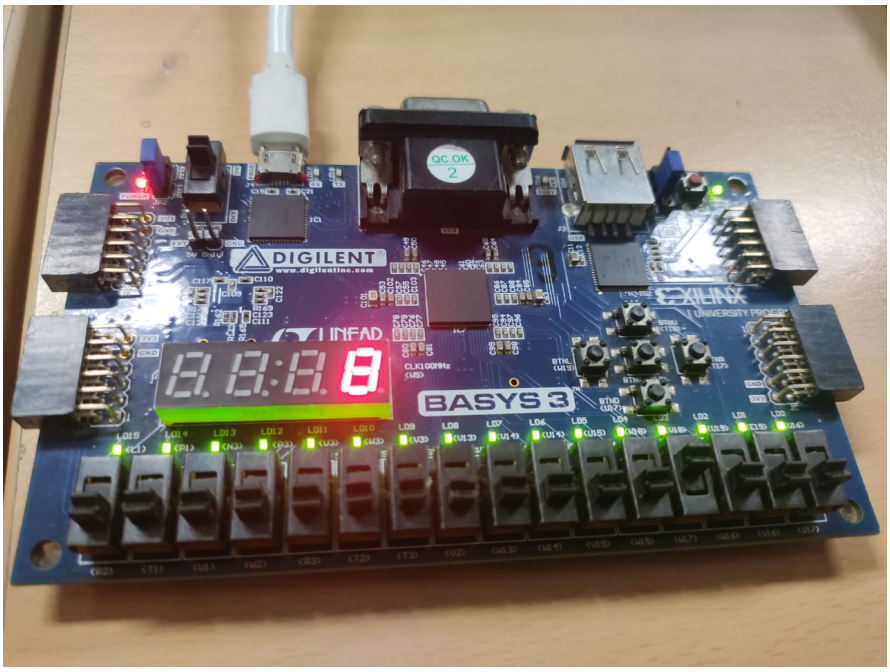
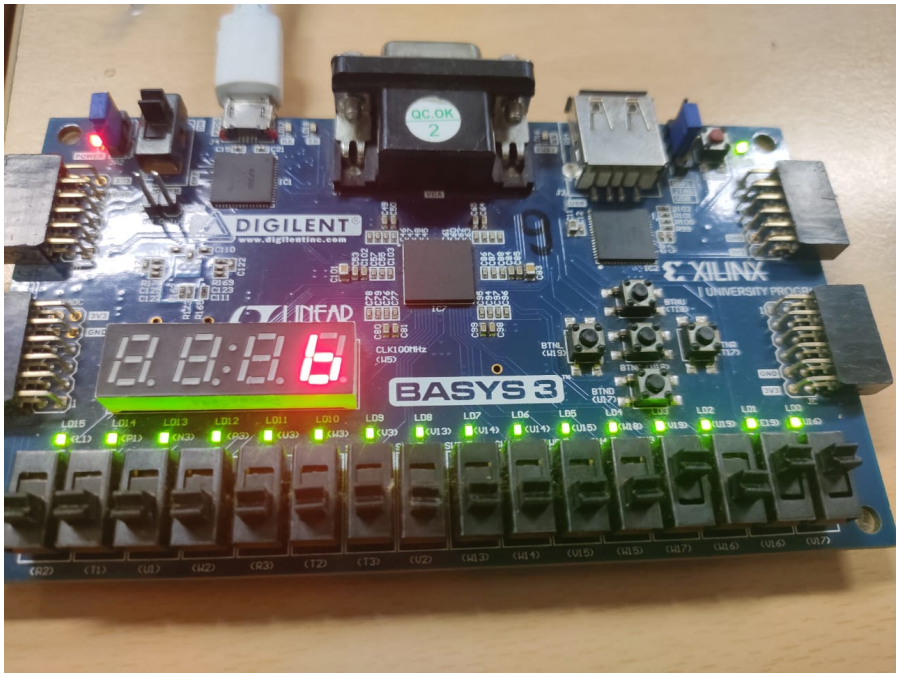
We have created three processes-

1. In our first process we have created two clock of frequency 1KHz and 1Hz with the given input frequency of 100MHz.
2. In our second process we have our up-down Counter which counts from 0 to 15 and then again to 0. This is basically our brightness level in continuous mode i.e. mode='1'.
3. In our third process we have checked the value of mode. If it is 0 then switch mode (brightness determined by input given by us through 4 bit slide switches) else continuous mode where brightness level is determined by up-down counter made in process two. In every 1 sec we are changing the brightness level in continuous mode. We are also displaying the brightness level on BASYS board in hexadecimal number system for 16 different levels.
   Concept involved in PWM was that we have initially set the value of 't'=0 and are increasing its value by one in every 1/1000 second. i.e. with frequency of 1000Hz. When it reaches to 15 it again start from 0 till 15 and so on. If value of 't' is less than the brightness level then LED will glow otherwise not glow. Hence if 't' is 5 then it will glow for 5/16 cycle and hence produce intensity of light accordingly.



Above is when mode is equal to 0 i.e. switch mode. And input brightness level is 8. Brightness level is displayed on seven-segment board.



Above test case is for when mode=0 (switch mode) and input brightness level is 11 i.e. in hexadecimal is ‘b’. displayed on seven-segment board.

Similarly we have checked all test cases for switch mode from brightness level 0 to 15. We got right result.
We have also checked continuous mode for 5 minutes and thighs were running all good. We got right result. We found that brightness level was rising from 0 to 15 and again down from 15 to 0 which was being reflected by LED and its value of brightness level was displayed by seven segment display all right.

Status of our Work:

All tasks are fully completed and also crossed checked.
We here by summit following files along with this Write-up-

1. Assignment6.vhd
2. Assignment6.bit
3. Assignment6.xdc