COE3DQ5 – Lab # 3 Report
Group # 33
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Exercise 1:

In this exercise, we first create an always comb block to display top left, top right, bottom left and bottom right. This is done by setting the exact range of X pixel position and Y pixel position, so it will display RGB color on the screen. We also have a frame counter in the always ff block that will always increment the frame 50 times and back to zero and repeat over and over. And we have four counters for RGB, if certain switch is on it will counts up and if its off it will counts down. We also use another always ff block for the PS2 code and make buffers for key L, A, Q, W and S. everything starts loading after key L is pressed and it will not load until key L is pressed again. When we want to freeze certain part of the screen, we will press certain key button and we will make the frame counter to stop counting for that part. It will continue to freeze until we press key L, and everything will restart to the switches order. The only problem that we cannot fix is that, the switches can still change the color for the screen before the L key is loaded. Everything else works perfectly.

Exercise 2:

Firstly, we extended our experiment 5.v file and created a game id that incremented every time we play a game and pressed the push button 3. We used that game id to check how many games we played and accordingly assigned game score to corresponding register that stored the game score. For the first game we assigned score to two registers, one to display previous game score and another to display the best score. For game two we created another register to store second best score by comparing best score with score in the new game. Similarly, we used this concept for the third game and all the games after that. To display the score on the screen, we used game over flag. When game over flag indicated game ended we turned the display for the game off and went to next state where we displayed score for the next game. To make sure we display one line, two lines and three lines for games one, two and three, we used game id to see how many games we played and used an if statement to show the GAME XX, SCORE XX on the screen. The game didn't restart until we pressed the push button 3, which reset the game score and lives. To make sure lives, score and games were 2-bit we increased the bits in the definition and displayed [7:4] and [3:0] on the x-axis.