COE3DQ5 – Lab #5 Exercise 1 Report
Group 14

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Oct 12th, 2019

a. Compute Y array

In order to get Y array output as expected, an 8 bit signal *y_array* is created. Within a separate *always_comb* block, an if else statement is used to compare the MSB of *read_data_a[0]* (W[i]) and *read_data_a[1]* (X[i]). If the condition is true, *y_array* return the difference between W and X; otherwise, the summation is performed between W and X. The first dual-port DRAM's input *write_data_b[0]* is overwritten with *y_array*.

b. Compute Z array

For this part of exercise that absolute value is involved, a function *abs* is created to take data in and do two's complement then return the absolute value out for signed negative numbers (positive one stays the same as input data). Within the same *always_comb* block stated above, another if else statement is used for checking whether *write_address* has achieved 256. If the condition is true, *z_array* will return the difference of *abs(read_data_a[0])* and *abs(read_data_a[1])* while return the average of summation instead if condition is false. The second dual-port DRAM's input *write_data_b[1]* is overwritten with *z_array*.