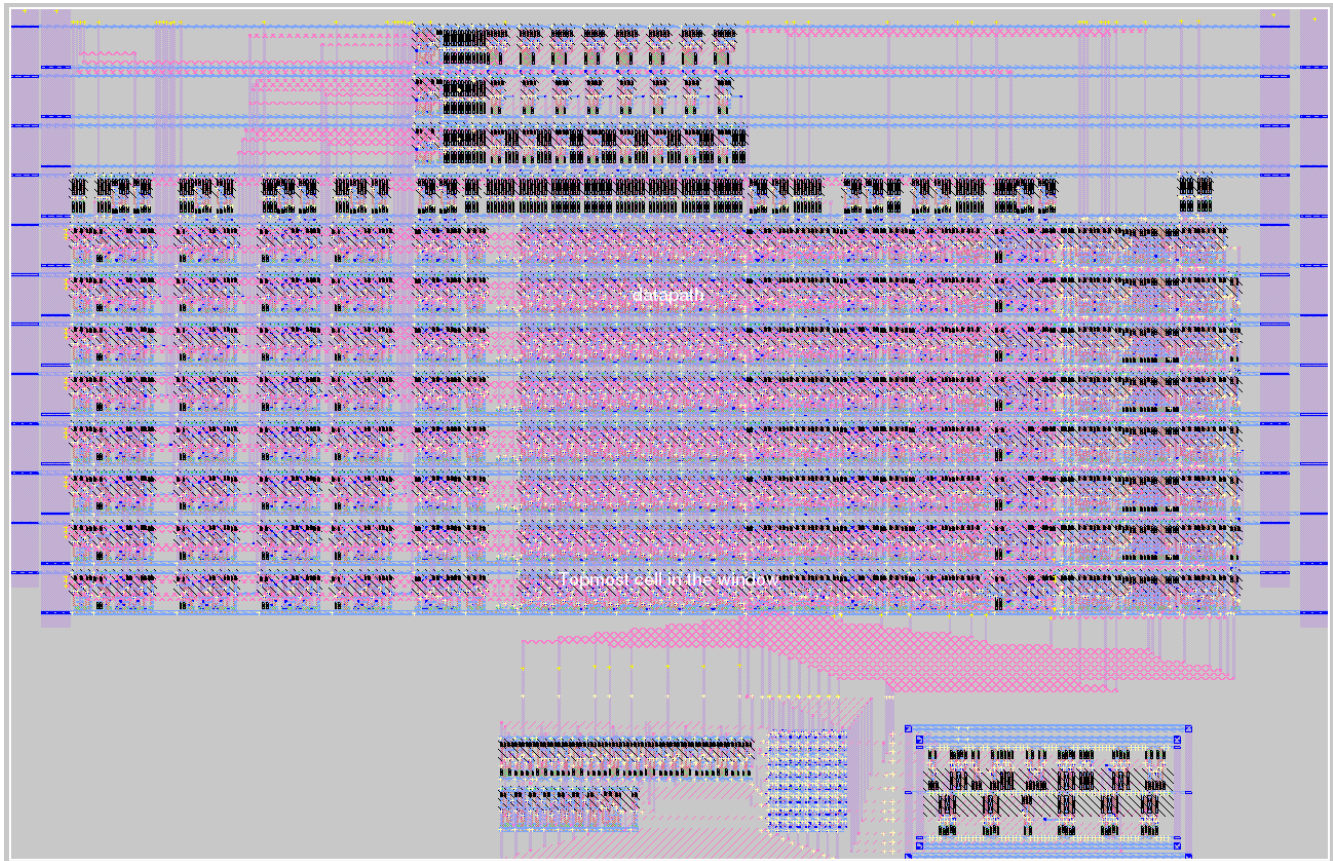
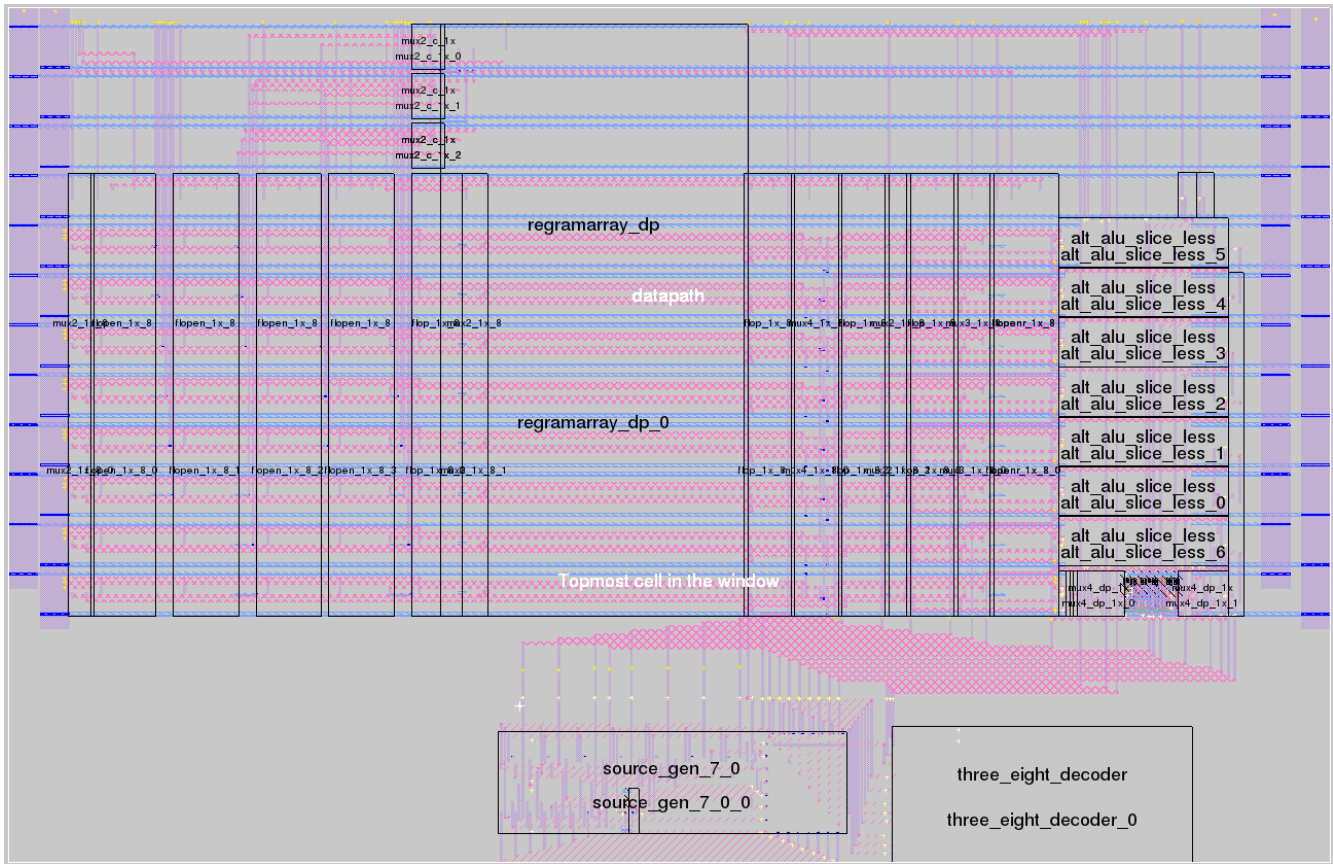


4/25/17 – MIPS Project Milestone 3

Overall datapath including new alu and shifter:



Simulation:

The datapath was tested in irsim, using exhaustive testing on the shifter (demonstrating all possible input values for b and k). The alu operation was also tested the same way as in lab 4. The design passes all tests. Below are a few selected test waveforms:

Complete exhaustive waveform:

op	9	57	65	49	40	84	86	3	11	15
a								255		
b										
k	000									
result								0		

add:

op	40										
a	00010010						00010011				
b	00000100	00001000	00010000	00100000	01000000	10000000	00000001	00000010	00000100	00001000	00010000
k	000										
result	00010110	00011010	00100010	00110010	01010010	10010010	00010100	00010101	00010111	00011011	

and

op	9										
a	00101101						00101110				
b	00000010	00000100	00001000	00010000	00100000	01000000	10000000	00000001	00000010	00000100	00001000
k	000										
result	00000000	00000100	00001000	00000000	00100000	00000000		00000010	00000100	00001000	

nor:

op	65										
a	11000011						11000100				
b	00000010	00000100	00001000	00010000	00100000	01000000	10000000	00000001	00000010	00000100	
k	000										
result	00111100	00111000	00110100	00101100	00011100	00111100		00111010	00111001	00111011	

or:

op	57										
a	00110010						00110011				
b	00000010	00000100	00001000	00010000	00100000	01000000	10000000	00000001	00000010	00000100	00001000
k	000										
result	00110010	00110110	00111010	00110010		01110010	10110010	00110011		00110111	00111011

sll:

op	3										
a	11111111										
b	01001011			01001100							
k	101	110	111	000	001	010	011	100	101	110	111
result	01100000	11000000	10000000	01001100	10011000	00110000	01100000	11000000	10000000	00000000	

slt:

op	86										
a	01100000					01100001					
b	00000100	00001000	00010000	00100000	01000000	10000000	00000001	00000010	00000100	00001000	00010000
k	000										
result	00000000				00000001	00000000					

sra:

op	15										
a	11111111										
b	01010110								01010111		
k	000	001	010	011	100	101	110	111	000	001	010
result	01010110	00101011	00010101	00001010	00000101	00000010	00000001	00000000	01010111	00101011	

srl:

op	11										
a	11111111										
b	00110101						00110110				
k	001	010	011	100	101	110	111	000	001	010	011
result	00011010	00001101	00000110	00000011	00000001	00000000		00110110	00011011	00001101	00000110

sub:

op	84										
a	01001000					01001001					
b	00001000	00010000	00100000	01000000	10000000	00000001	00000010	00000100	00001000	00010000	00100000
k	000										
result	01000000	00111000	00101000	00001000	11001000	01001000	01000111	01000101	01000001	00111001	00101001

xor:

op	49										
a	01100101					01100110					
b	00000100	00001000	00010000	00100000	01000000	10000000	00000001	00000010	00000100	00001000	00010000
k	000										
result	01100001	01101101	01110101	01000101	00100101	11100101	01100111	01100100	01100010	01101110	01101110