

Lab 5: MIPS Datapath for R and I-type Instructions

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Introduction: The purpose of this lab is to construct a Datapath that can accept R, I and J-type instructions. The idea is to build onto the Datapath that was made in lab 4.

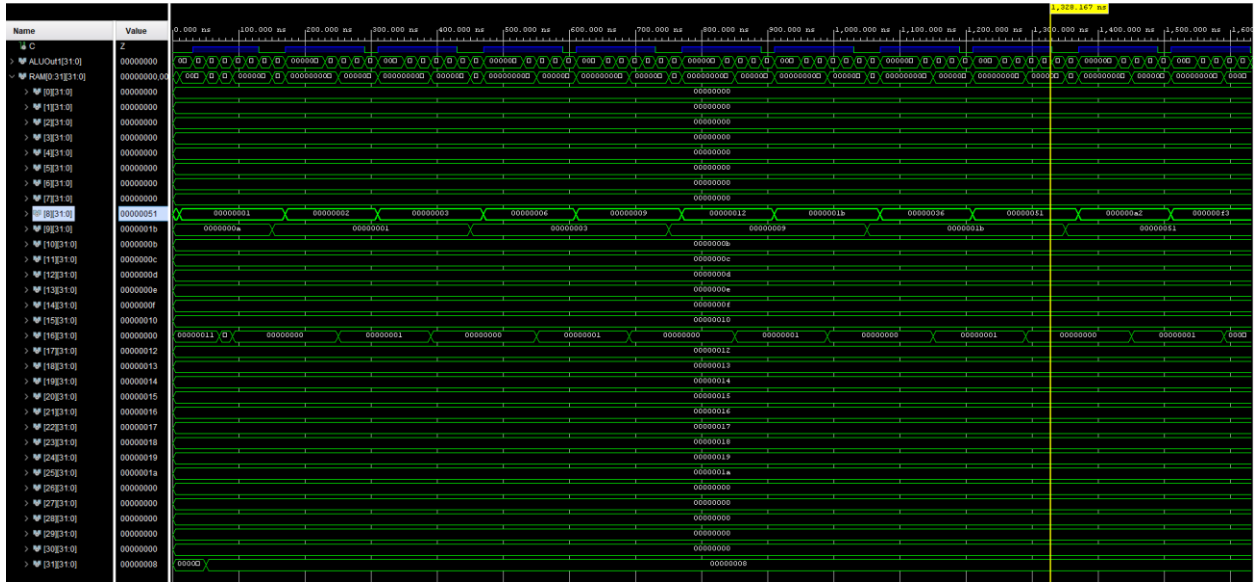
Problem Logic & Solution: I used Vivado's block design tool to add the extra components needed to support the J-type instructions. Also, I modified some components to allow for J-type instructions.

Logic Utilization	Used		
	R-type	R and I-type	R, I, and J-type
# of LUTs	519	599	599
# of Flip-Flops	43	43	43
# of Slices	836	836	836
Max Frequency (MHz)	100	100	100

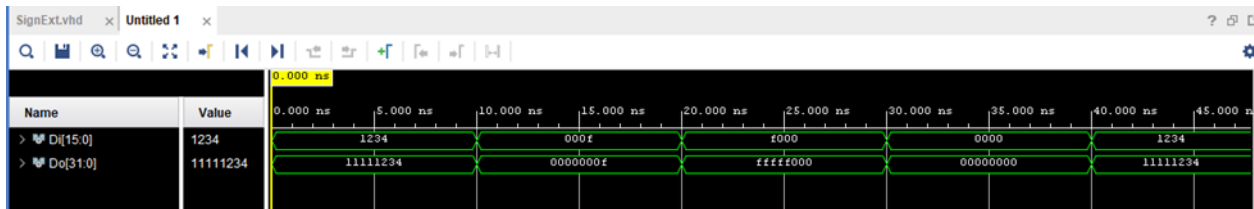
Simulation Results

- Datapath

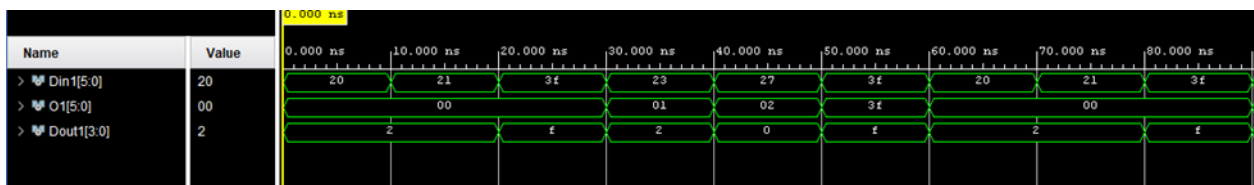
- MIPs



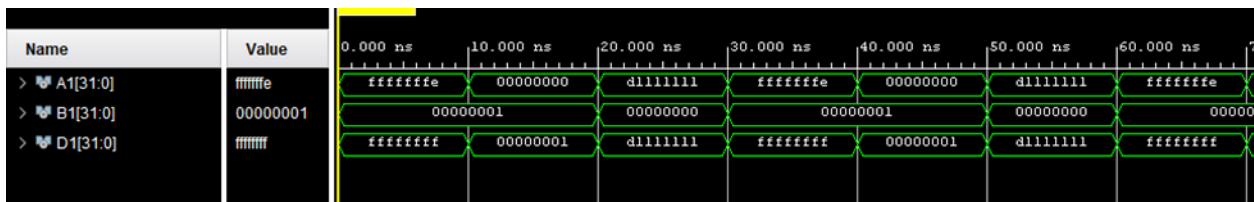
- SignExt



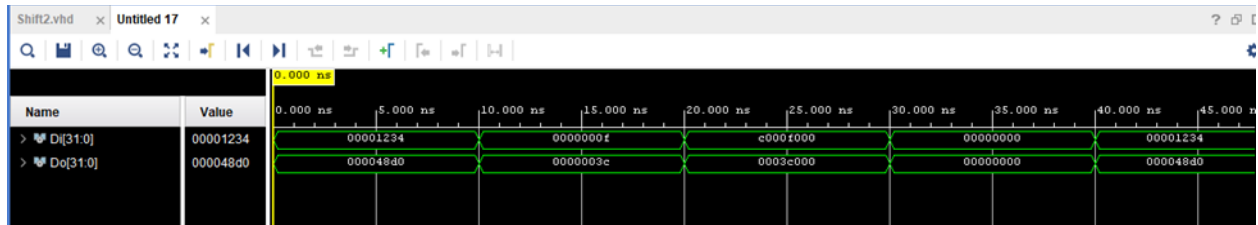
- ALUCNTL



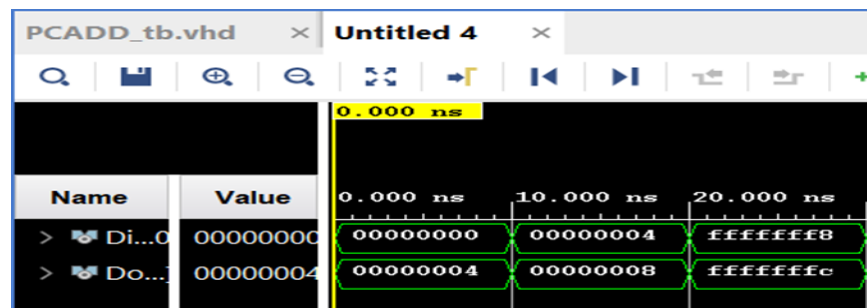
- ADD



- Shift2



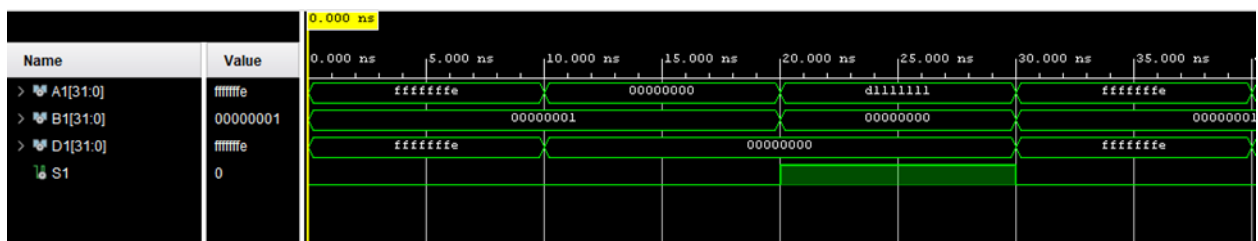
- PCADD



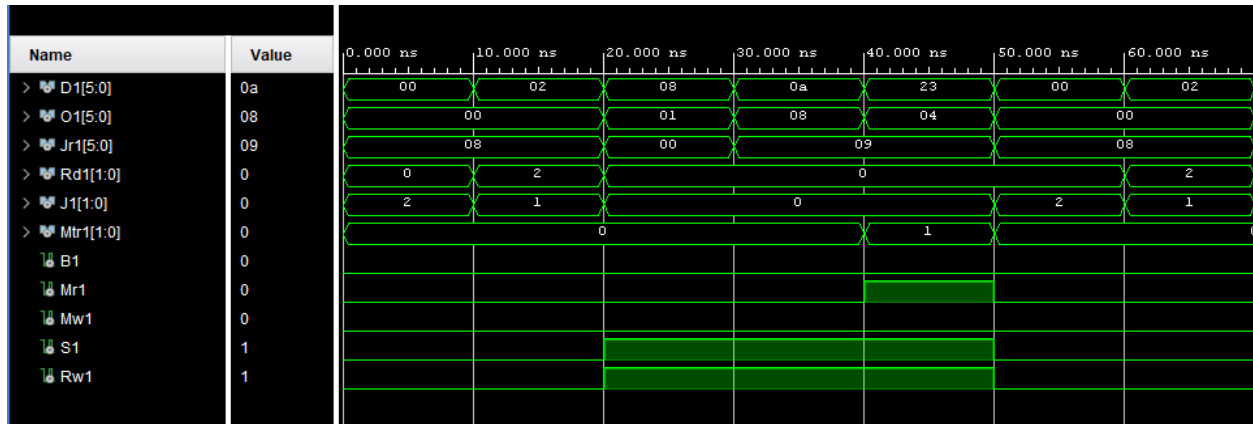
- PC



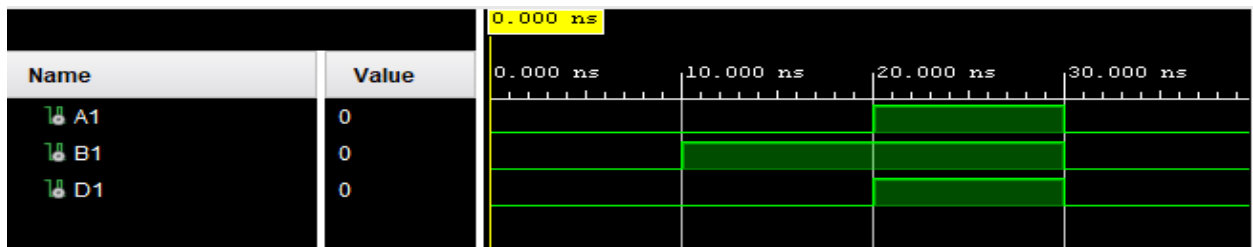
- Mux32b



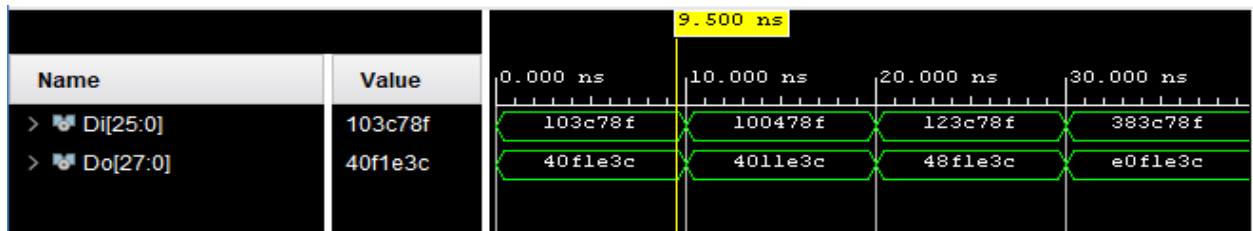
- Control



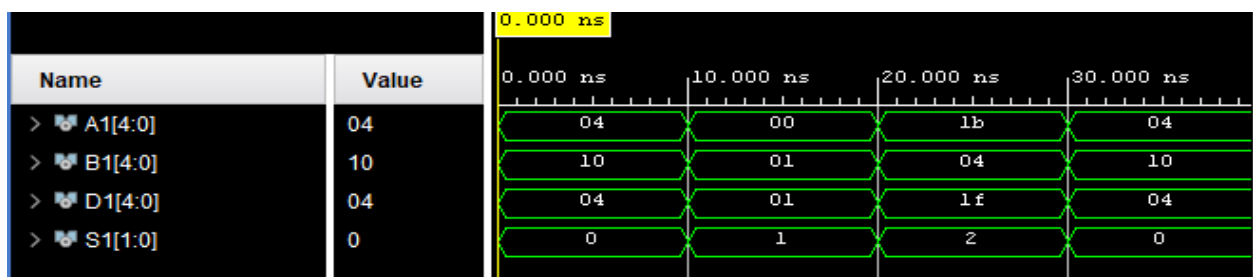
- GAND



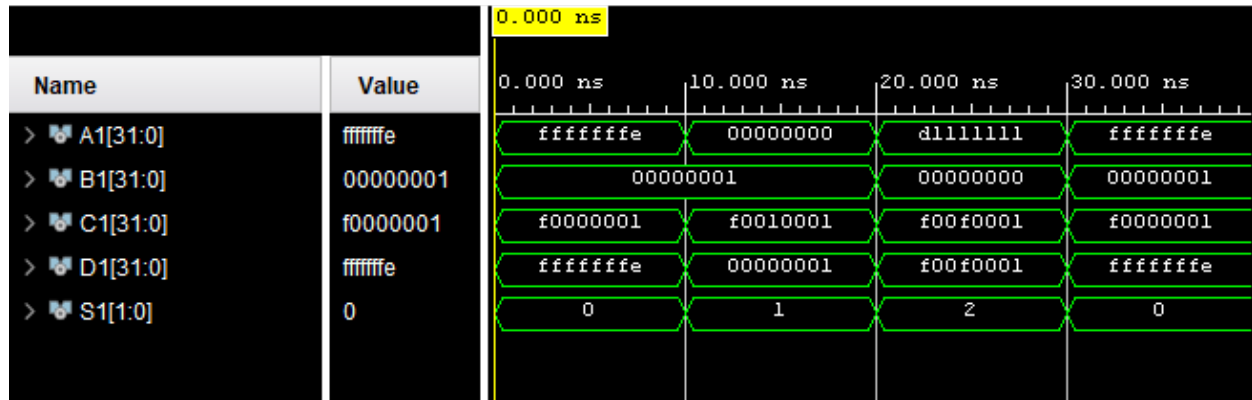
- Shift28



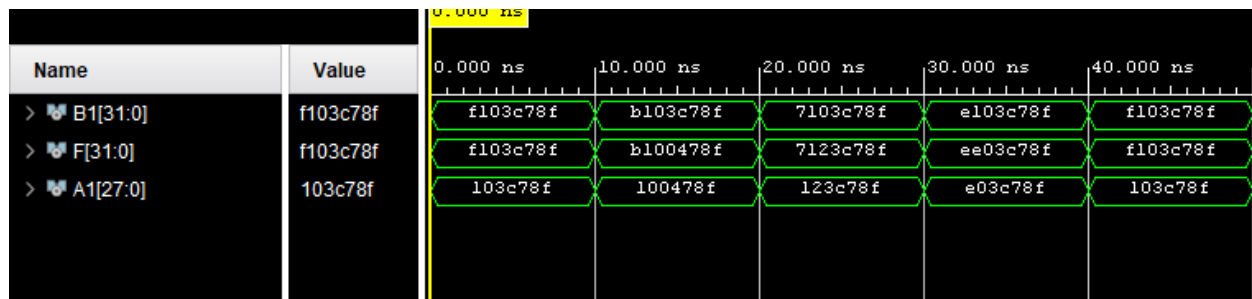
- Mux5b



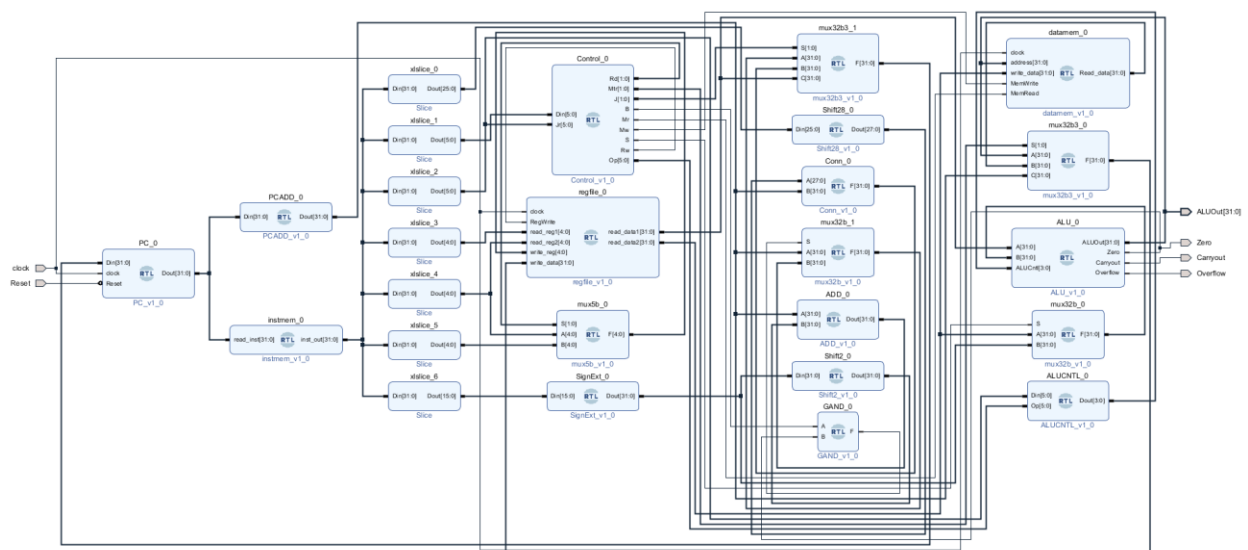
- Mux32b3



- Conn



Block Diagram



Conclusion: This lab was fairly simple I struggled to get jal working but quickly discovered the bug.