EGR 2700 Project: 8-Bit Signed Calculator

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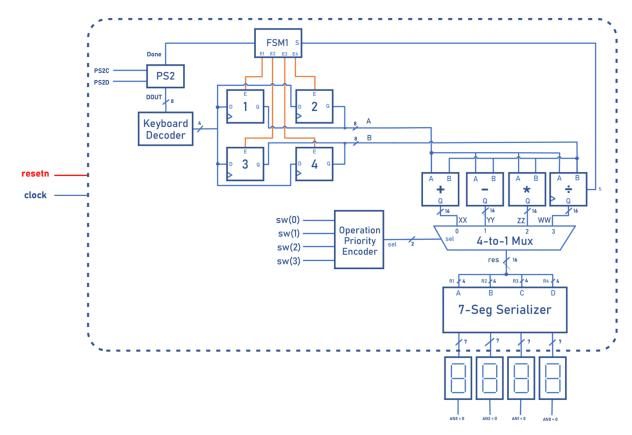
Functionality

The functionality of our calculator includes:

- Entering a two-digit hex number
- Selecting an operator with a switch
- Entering another two-digit hex number
- Outputting the answer with respect to the selected operator



Block Diagram



Reading Keyboard Input:

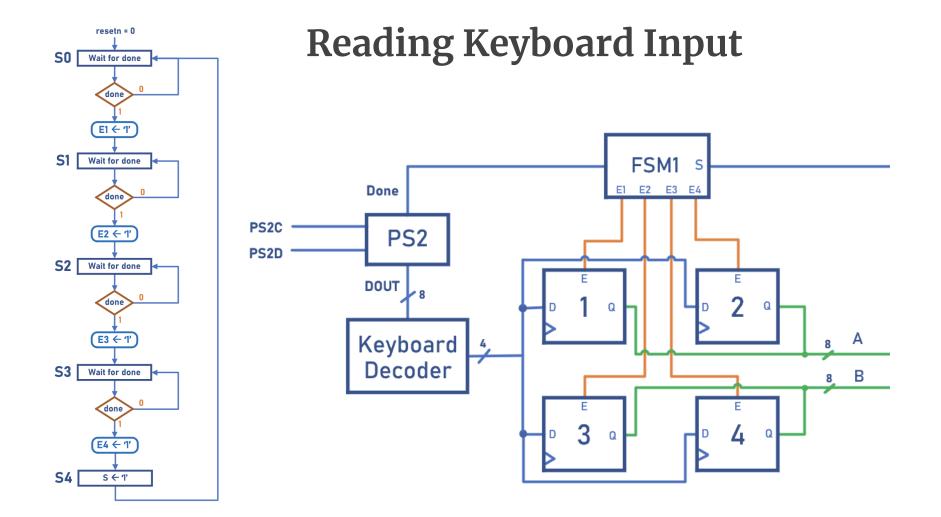
- FSM
- Four Registers
- Keyboard Decoder
- PS2

Arithmetic/Switches

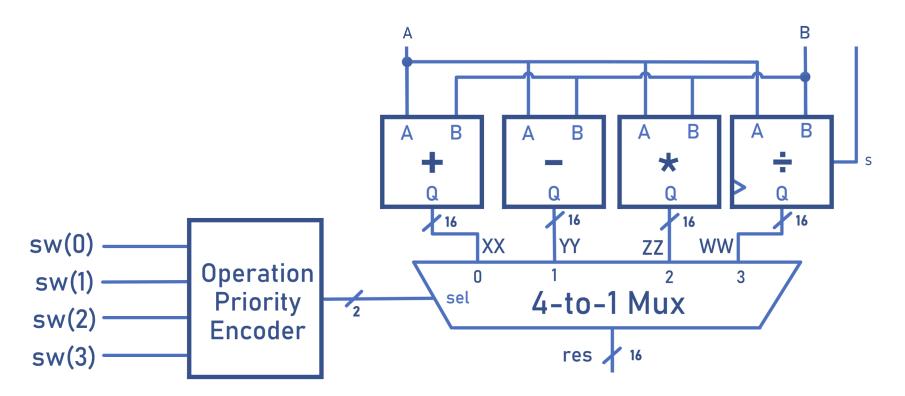
- Adder, Subtractor, Multiplier, Divider
- 4-to-1 Mux
- Operation Priority Encoder

Display:

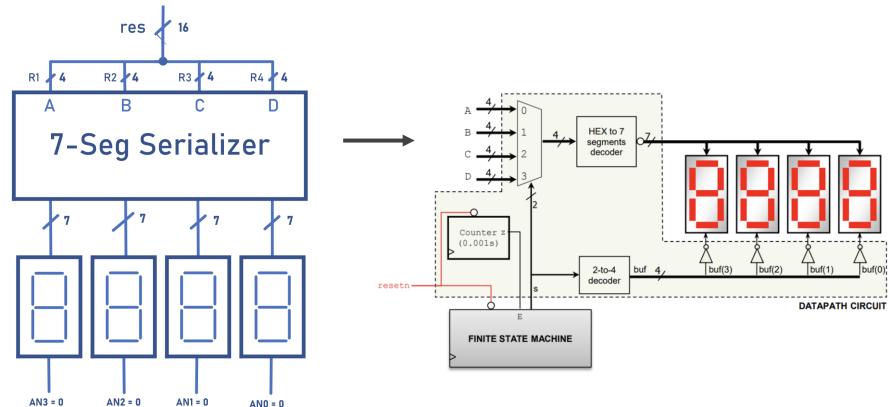
• 7-Segment Serializer



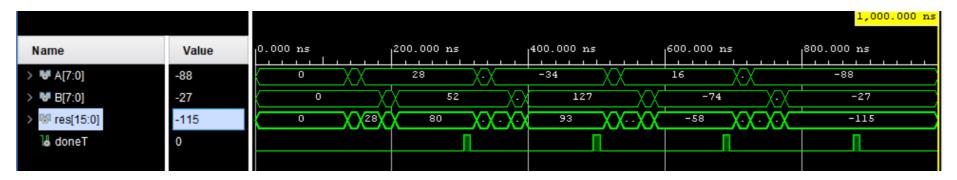
Arithmetic/Switches



Display

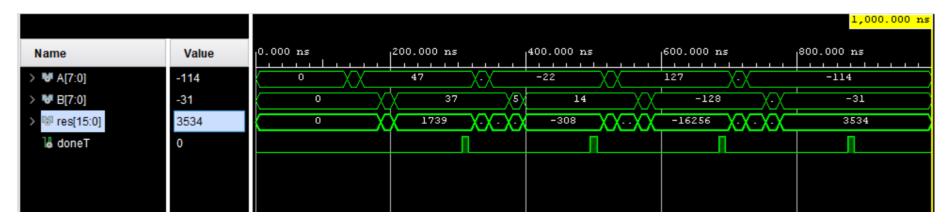


Simulations (Add/Subtract)



Name	Value	0.000 ns 200.000 ns 400.000 ns 600.000 ns 800.000 ns
> 😼 A[7:0]	-39	
> 😼 B[7:0]	-79	0 17 90 -42 -79
> 😽 res[15:0]	40	
🐻 doneT	0	

Simulations (Multiply/Divide)



		209.430 ns														
Name	Value		250.000 ns	300.000 ns	350.000 ns	400.000 ns	450.000 ns	500.000 ns	550.000 ns	600.000 ns	650.000 ns	700.000 ns	750.000 ns	800.000 ns	850.000 ns	900.000
> 😼 A[7:0]	115		115	X-125	X	-127		97		104		X -56 X		-57		
> 😻 B[7:0]	5			5		X	6				-8		-24		-21	
> 😽 res[15:0]	0		$\infty \infty \infty \infty$	23	-23			-21 21	21 X	XXXXXX	- X-X-X-X-1	1	3			2
🐻 doneT	0															

Video

https://www.youtube.com/watch?v=lcjVxKpi5EU