

Binary division for ALU

“Binary [division] is even harder than binary [subtraction]. There is no good iterative combinatorial circuit available, so we must use even heavier artillery. The solution is going to be to use a sequential circuit that computes one addition for every clock pulse. We will discuss this more in a later section since it needs mechanisms we have not discussed yet.”

Source: <https://www.labri.fr/perso/strandh/Teaching/AMP/Common/Strandh-Tutorial/circuits-for-binary-arithmetic.html>

8-Bit Divider complexity:

<https://www.youtube.com/watch?v=RBkNBpylcJk>

Slow Division Concept for ALU:

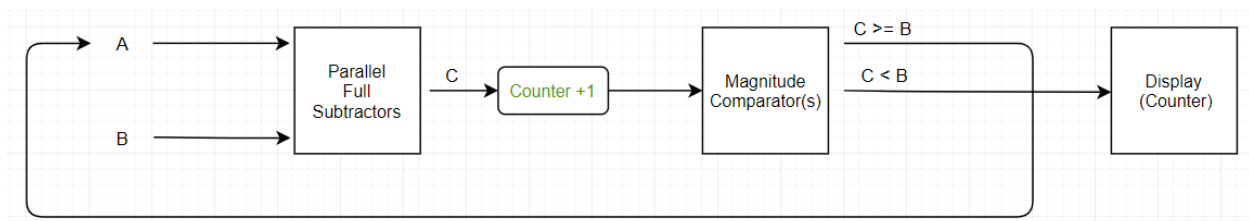


Figure 1: Simplified Concept for Division Using Block Diagrams

Example: 16 divided by 4

Step	Remainder	Divisor	Counter	Subtractor	Comparator	Loop?	Output
0	16	4	0				
1	16	4	1	$16 - 4 = 12$	$12 \geq 4$	Yes	
2	12	4	2	$12 - 4 = 8$	$8 \geq 4$	Yes	
3	8	4	3	$8 - 4 = 4$	$4 \geq 4$	Yes	
4	4	4	4	$4 - 4 = 0$	$0 < 4$	No	4