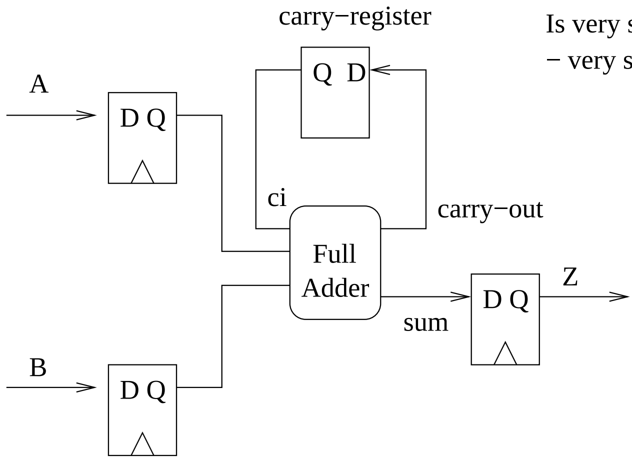
Bit Serial Adder



Is very suitable when the data is coming in/going out serially.
− very small and can deal with data streams at ~ 1Ghz (0.18um)

Carry−Save Adder (CSA) and Carry Save Trees

Regular Way

- add each column and bring carries over to the next column
- the Cn + An + Bn = {Cn+1, SUMn}

	carry−bits	
	00110	
A	10011	19
+ B	+ 00110	6
	011001	25

This calculation can also be done if we seperately produce the sum and carry bits and add them at the end!

	10011	19
	+ 00110	6
(A xor B) IntSum	10101	21
Carry	00010	2*2
	011001	25

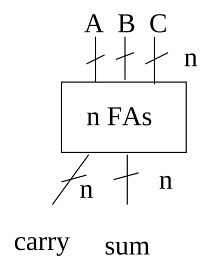
So far this isn't particularly usefull, but if we look at a 3 input adder:

A	0 1 1 0 0	12
+ B	1 0 0 1 1	19
+ C	0 0 1 1 0	6
Sum bits	1 1 0 0 1	25
Carry bits	0 0 1 1 0	6*2
Final Result	1 0 0 1 0 1	37

INDEPENDENTLY, for each column produce a sum and carry bit with a normal full−adder

Eventually add them up for the final result.

A CSA adder representation



A 3 to 2 reduction of terms!

We can build a tree and get a logarithmic circuit!