

Section 1 - Carry Lookahead Adders

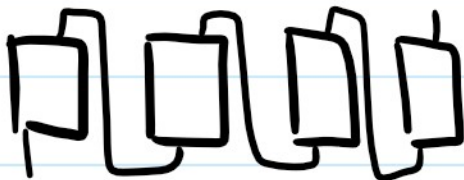
Wednesday, June 19, 2019 12:58 PM

• SECTION 1.

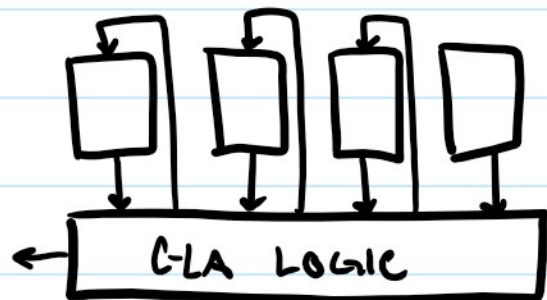
• CARRY-LOOKAHEAD ADDERS •

- A CARRY-RIPPLE ADDER HAS LARGE DELAY DUE TO THE CARRY TRAVELING THROUGH MANY ADDERS
 - A CARRY-LOOKAHEAD ADDER PRE-COMPUTES THE CARRY
 - ↳ LESS DELAY
 - ↳ MUCH LARGER
- } A TRADE-OFF

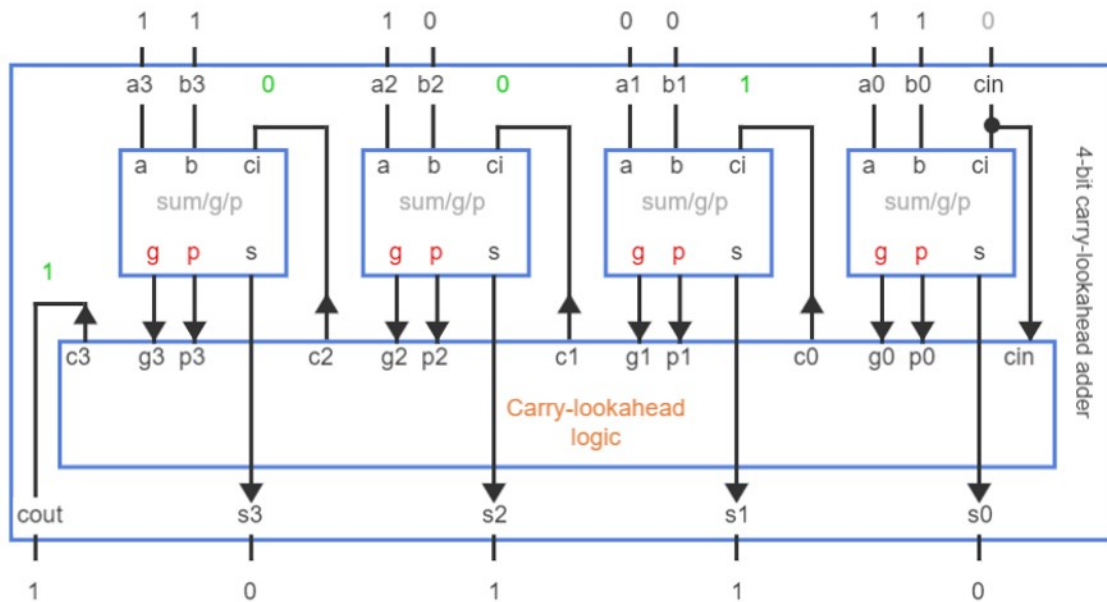
CARRY RIPPLE



CARRY LOOKAHEAD



A CLOSER LOOK



- WHEN a AND b are both 1, the digit **generates** a carry out regardless of the carry-in
- When a OR b is 1, the digit sets carry-out to 1 if carry in is 1
So if $(a \vee b)$ the carry out = carry in
this is **propagating**

So!

$$g = ab \quad p = a + b$$

EACH DIGITS CARRY OUT IS

$$C_0 = ab + (a+b)c_i = g + pc_i$$

EACH CARRY IN IS THE PREVIOUS CARRY IN