

Chapter 3

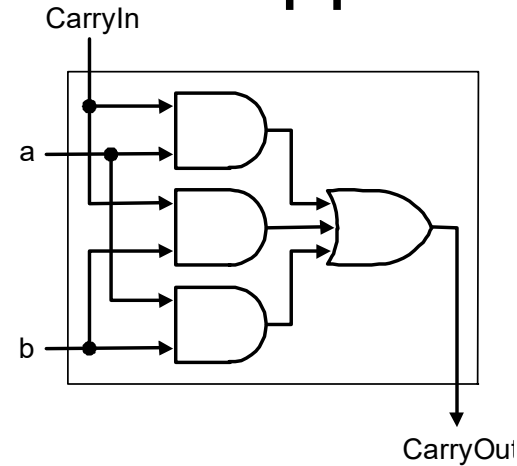
Arithmetic for Computers



Can We Make a Faster Adder?

- Worst case delay for N-bit Ripple Carry Adder

- 2N gate delays
- 2 gates per CarryOut
- N CarryOuts

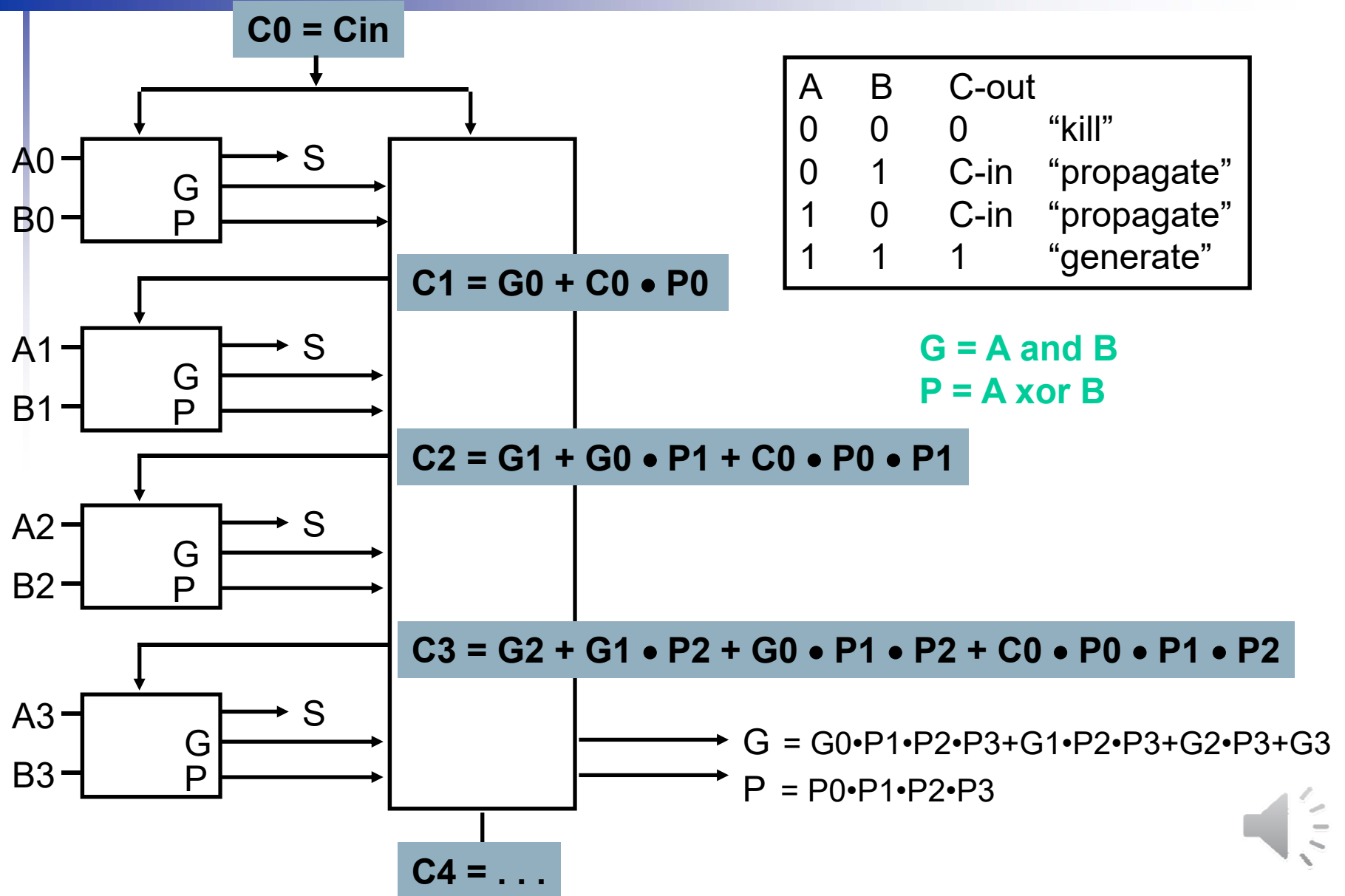


- We will explore the Carry Lookahead Adder

- Generate - Bit i creates new Carry
 - $g_i = A_i \& B_i$

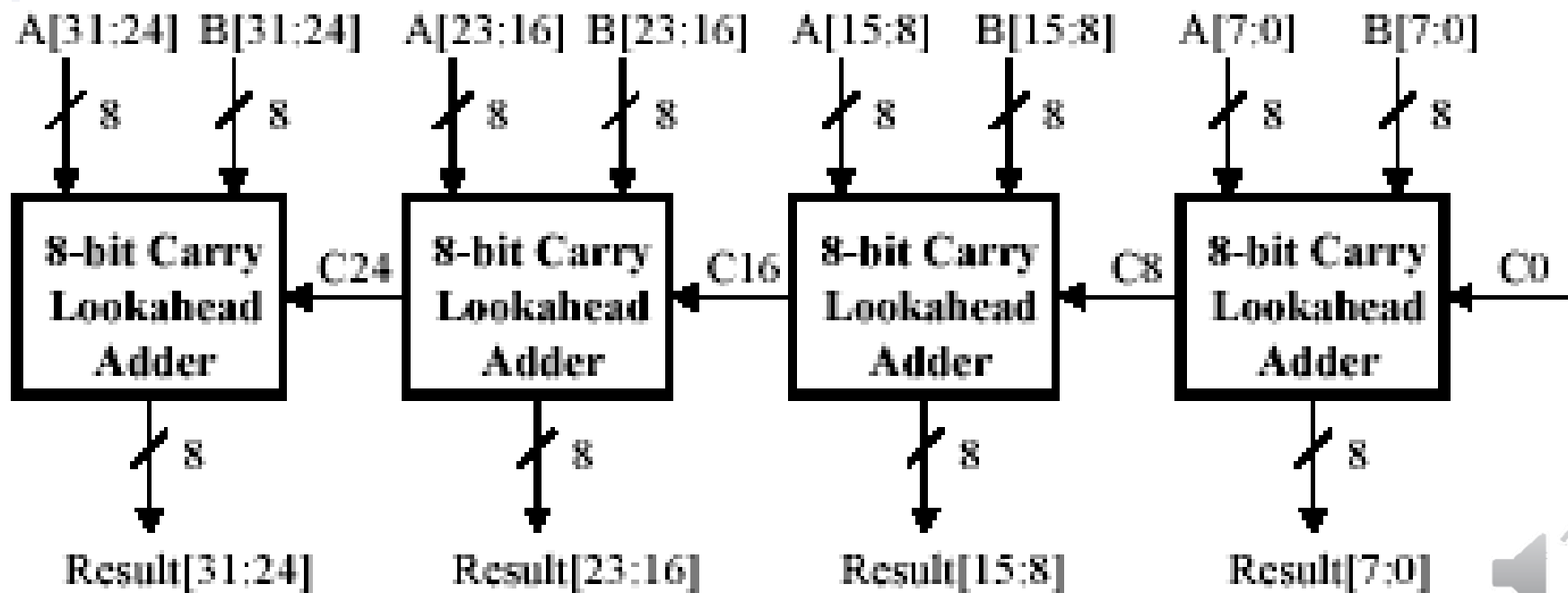


Carry Look Ahead

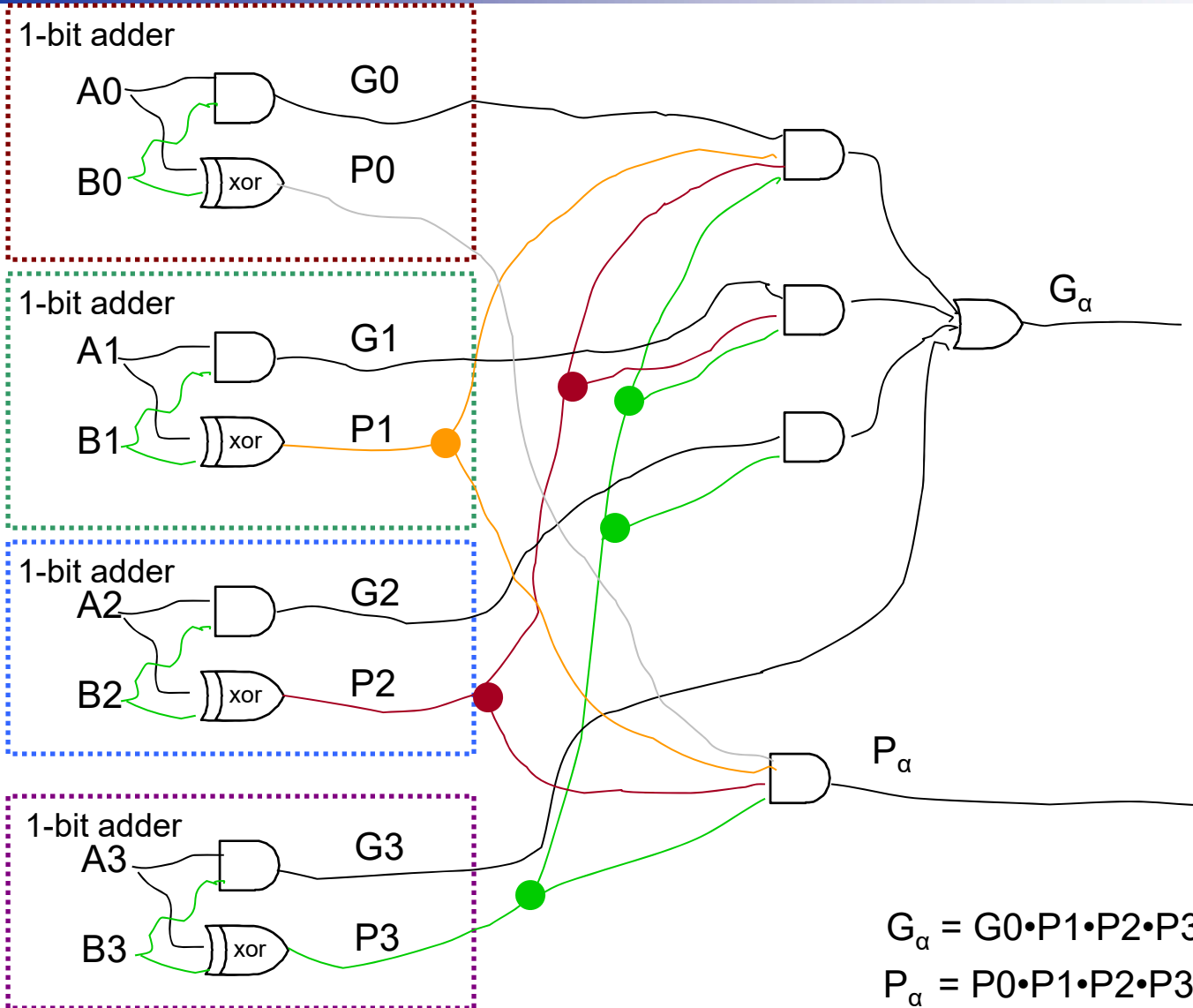


Partial Carry Lookahead Adder

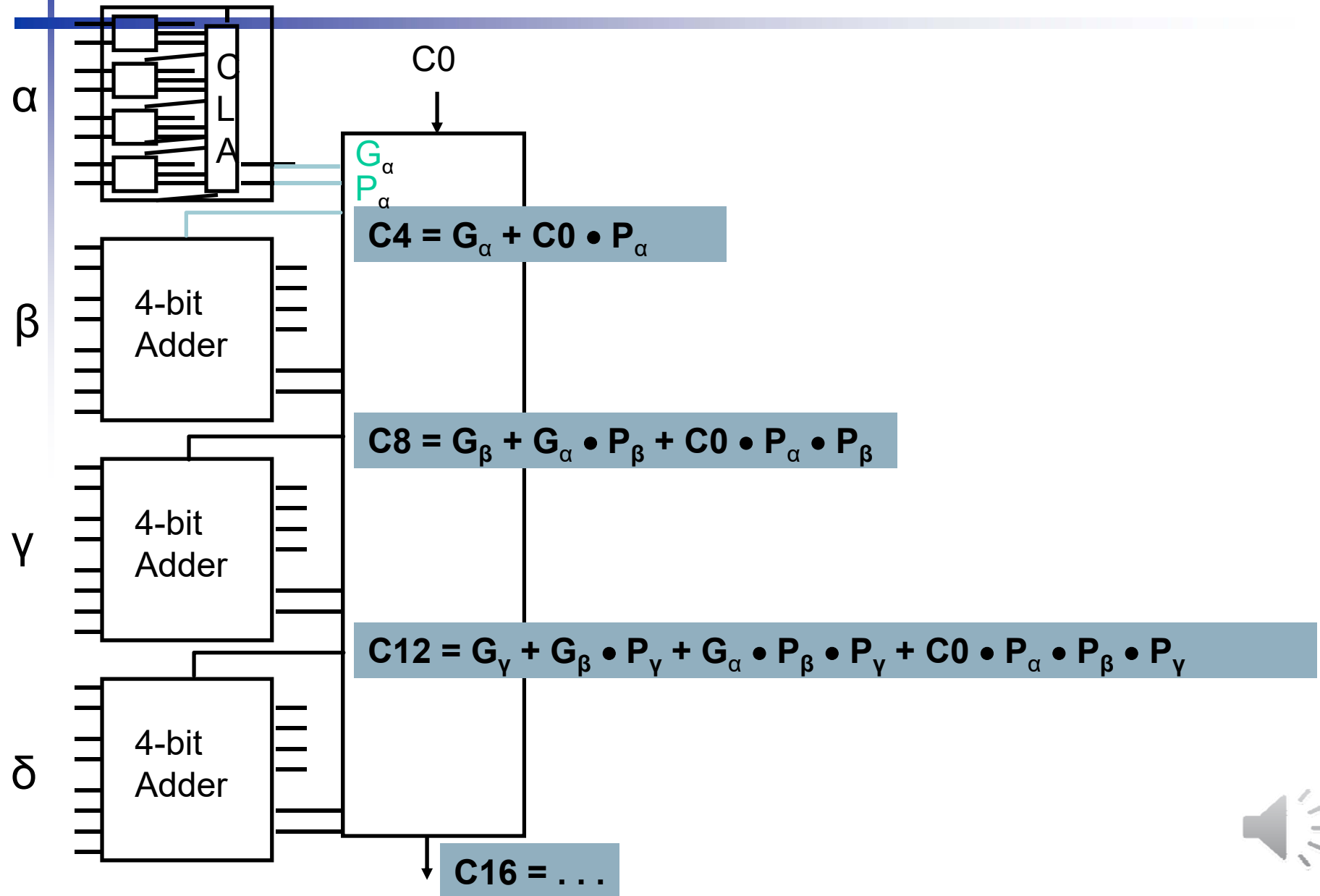
- Connect several N-bit Lookahead Adders together
- Four 8-bit carry lookahead adders can form a 32-bit partial carry lookahead adder



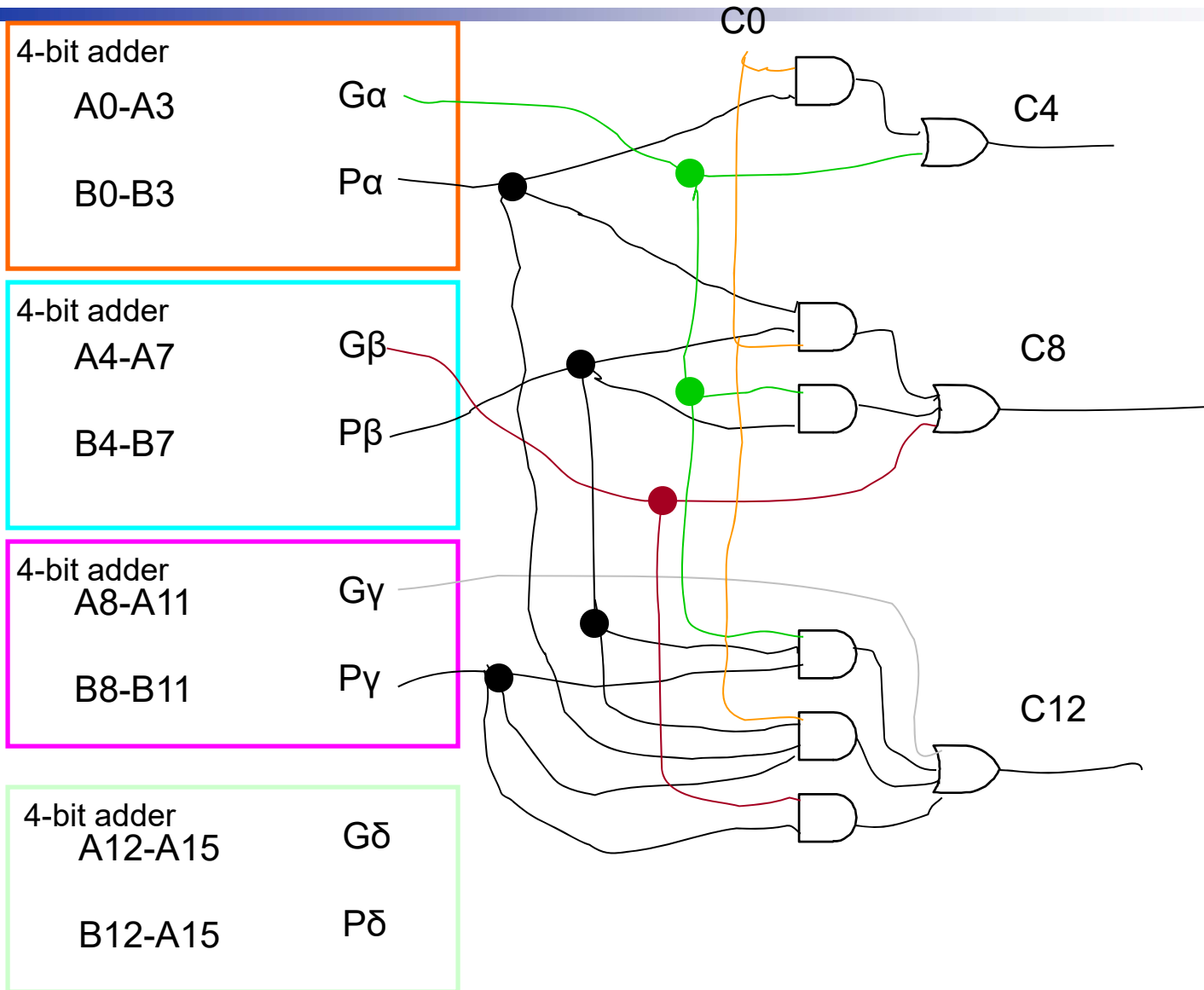
Generate and Propagate



Hierarchical CLA



Generate and Propagate



Carry Select Adder

