ECE311 Hardware Design

Week 4: Adder Comparison Report

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The carry look-ahead adder is faster than the ripple carry adder due to the error propagation that the ripple carry adder exhibits. In the ripple adder, the carry inputs are wired from one adder to the other, which causes the delays of each adder to accumulate. To circumvent this, the carry look-ahead adder uses hardware that calculates the carry-on from the inputs (4 bits of a, 4 bits of b, and cin) and inputs them into the adders.

If one were to simulate the two circuits, they could observe that the delays of the ripple adder builds up as a result of multiple carry-on's. However, the carry look-ahead circuit would only have the delays from the carry on calculator and adder (adder delays should occur simultaneously).