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CPE 133 Lab 3

**Summary**

**Rippled-Carry-Adder (RCA):** We designed and implemented a 4-bit RCA made up of one half-adder & three full-adder circuits.

**Reduced-Full-Adder:**

**Reduced-Half-Adder:**

**Verification**

**Questions**

1. In your own words, briefly but completely explain why the circuit in this lab activity is referred to as a ripple carry adder.

It is called a ripple carry adder because the carry out of each adder is the carry in of the next one. So each output is carried or ‘rippled’ to the next adder.

2. If you needed to extend the RCA from this lab activity to an 8-bit RCA by using a structural model with two 4-bit RCAs, what changes would you need to apply to the 4-bit RCA?

Make the second 4 bit RCA start with a full adder and make the carry out of the first 4 bit RCA be the carry in of the first full adder of the second 4 bit RCA.

3. How many rows would there be in the truth table for a 4-bit RCA? How many input and output variables are there? Would it be feasible to design a 32-bit RCA using this technique?

256. There are 8 inputs and 5 outputs. No because there would be 2^64 possible input combinations and 33 outputs.

4. If you were to implement the 4-bit RCA using discrete logic, how many logic gates would be required?