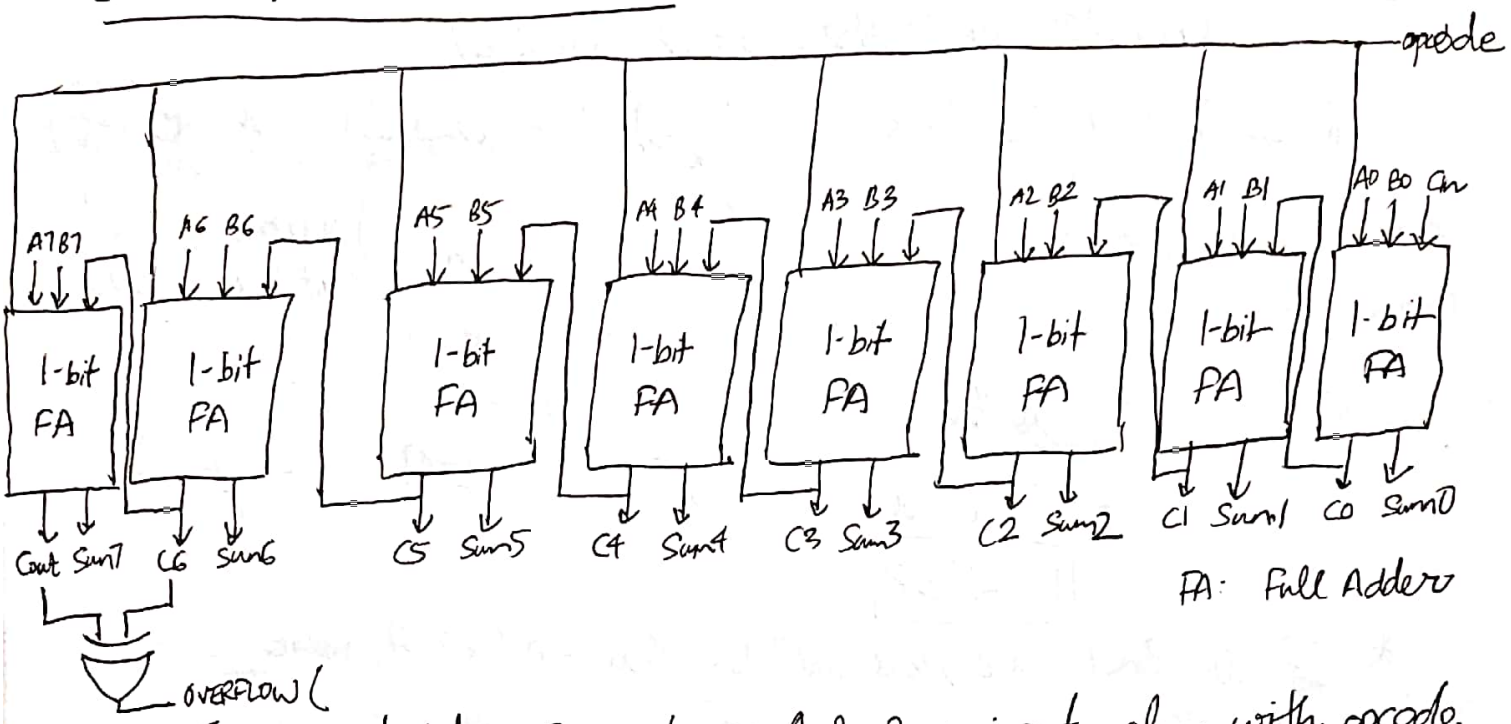
CS220

ASSIGNMENT 4

8 BIT ADDER SUBTRACTOR CIRCUIT:



→ The circuit takes 2 numbers A & B as input along with opcode (which specifies whether to add or subtract) and cin and outputs the result.

→ If opcode is 0, addition takes place taking cin as 0.

→ If opcode is 1, subtraction takes place. For this, we have to take the 2's complement of 2nd number. To achieve this, we invert the 2nd number and take cin as 1.

→ To check the correctness of result, we check for overflow by taking XOR of C6 & Cout. If it is 1, there is an overflow.

→ The logic followed is:

$$Sum = (In1) \wedge (In2) \wedge (Cin)$$

$$Carry = (In1 \& In2) \mid (In1 \& Cin) \mid (In2 \& Cin)$$

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