Computer Science Foundation Lab 4

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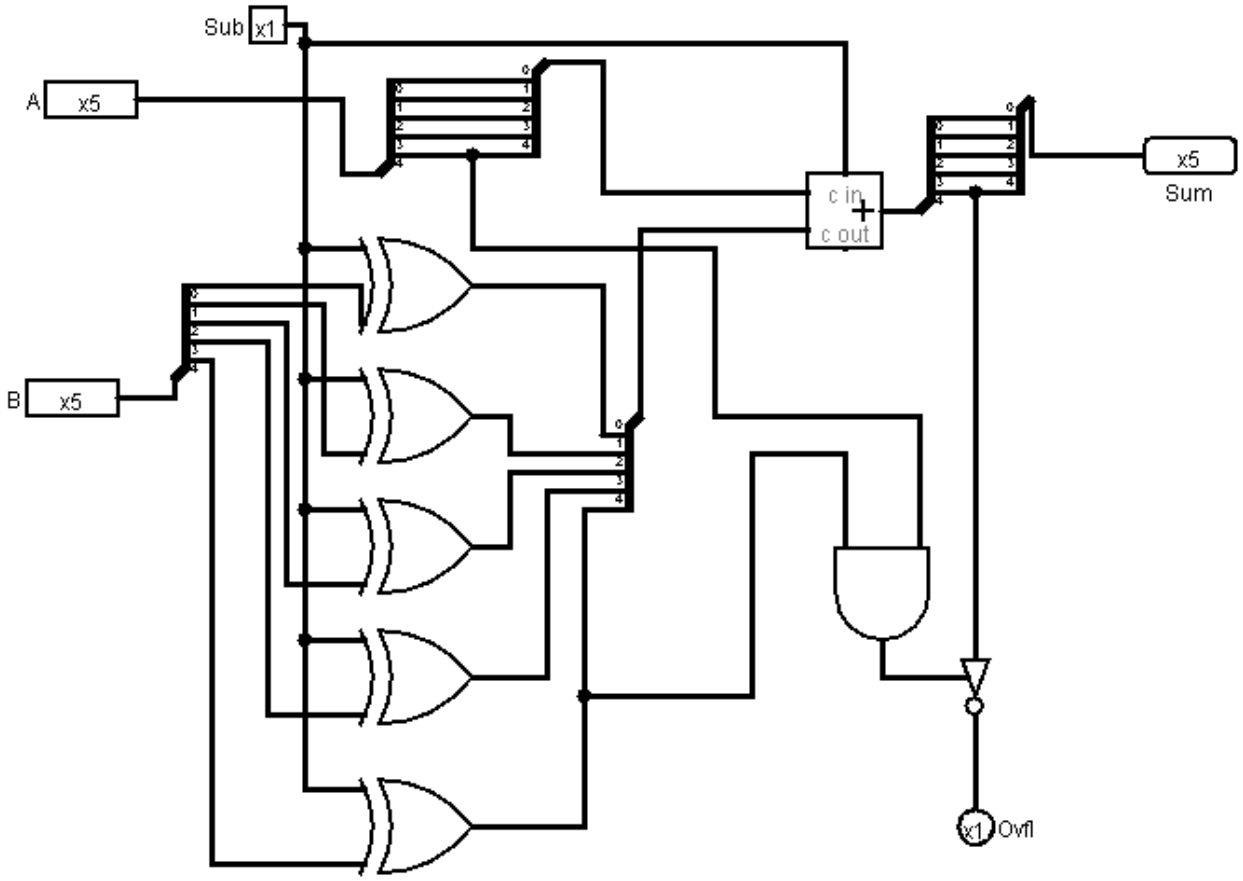
Part 1

1.Adder-Subtracter



2. Why does the Sub signal go into the Cin of the Adder?

So that both inputs from A and B can be impacted by subtraction/addition.

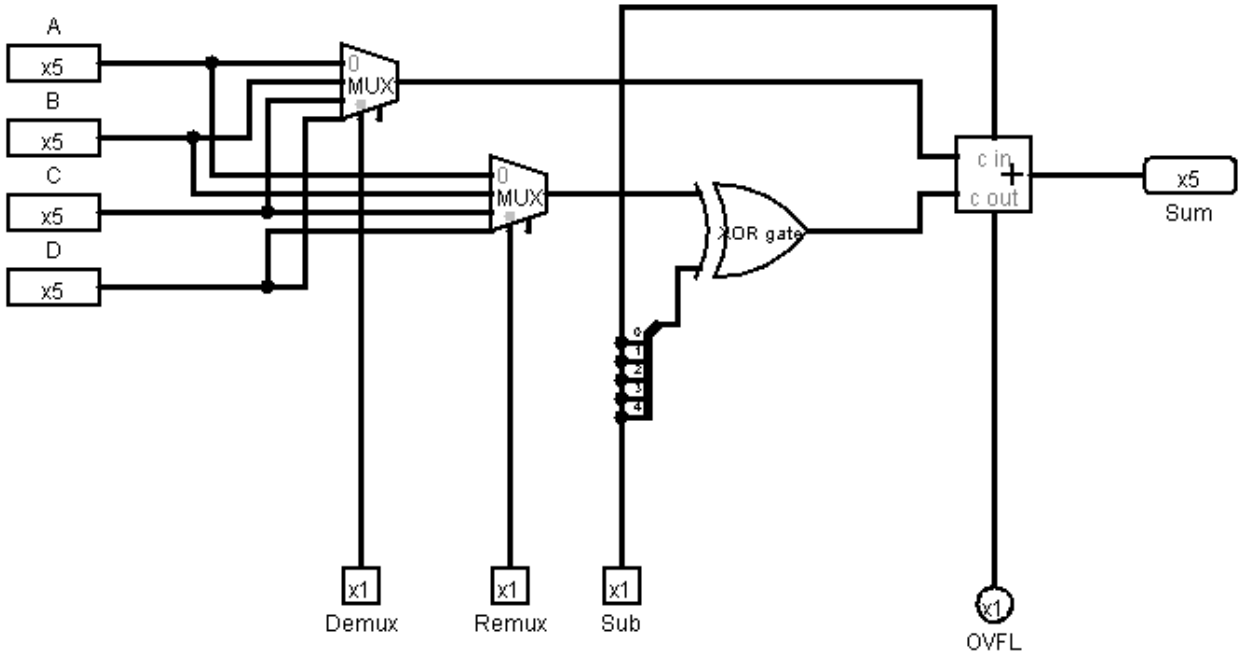
3. Function Table

Sign A	Sign B	Sign Sum	Ovfl
0	0	0	0
0	0	1	1
0	1	0	0
0	1	0	0
1	0	0	0
1	0	0	0
1	1	0	1
1	1	1	0

4. Logic Table

Sign A	Sign B	Sign Sum	Ovfl
$\bar{A}$	$\bar{B}$	$\bar{s}$	~Ss
$\bar{A}$	$\bar{B}$	s	$\bar{S}$A ^$\bar{S}$B^Ss
$\bar{A}$	B	$\bar{s}$	~Ss
$\bar{A}$	B	$\bar{s}$	~Ss
A	$\bar{B}$	$\bar{s}$	~Ss
A	$\bar{B}$	$\bar{s}$	~Ss
A	B	$\bar{s}$	SA^SB^$\bar{S}$s
A	B	s	~Ss

Part 2



1. What is the purpose of the Xor gate?
   It is a decision gate, two inputs only one selected for output.

2. What, specifically, is the wiring of the splitter near the Xor gate?
   The wiring is a bundler where single bits are combined together before entering the 5 bit input to the Xor gate.

3. The control code for the circuit is indicated by pins at the bottom of the circuit. How many control bits are there? **There are three, the Demux, Mux and Sub. The fourth pin is the**

overflow pin which received its input from the Adder depending on the signal initiated at the input pins.

4. How many operations can the circuit perform? **This circuit technically can handle four inputs at once, However there are only two mux limiting parallel processing to until these signals arrive at the adder where both signals are need to allow the sum to be created. The number of sub-ops is six with two outputs, sum and overflow.**

5. Describe in one or two sentences what operations can be performed on the inputs A,B,C,D by the circuit. **Addition and subtraction**