Week 7 Review

Question #1

- What is the result of the following operation?

Verify!

```
   1010
x  1101
-------
```

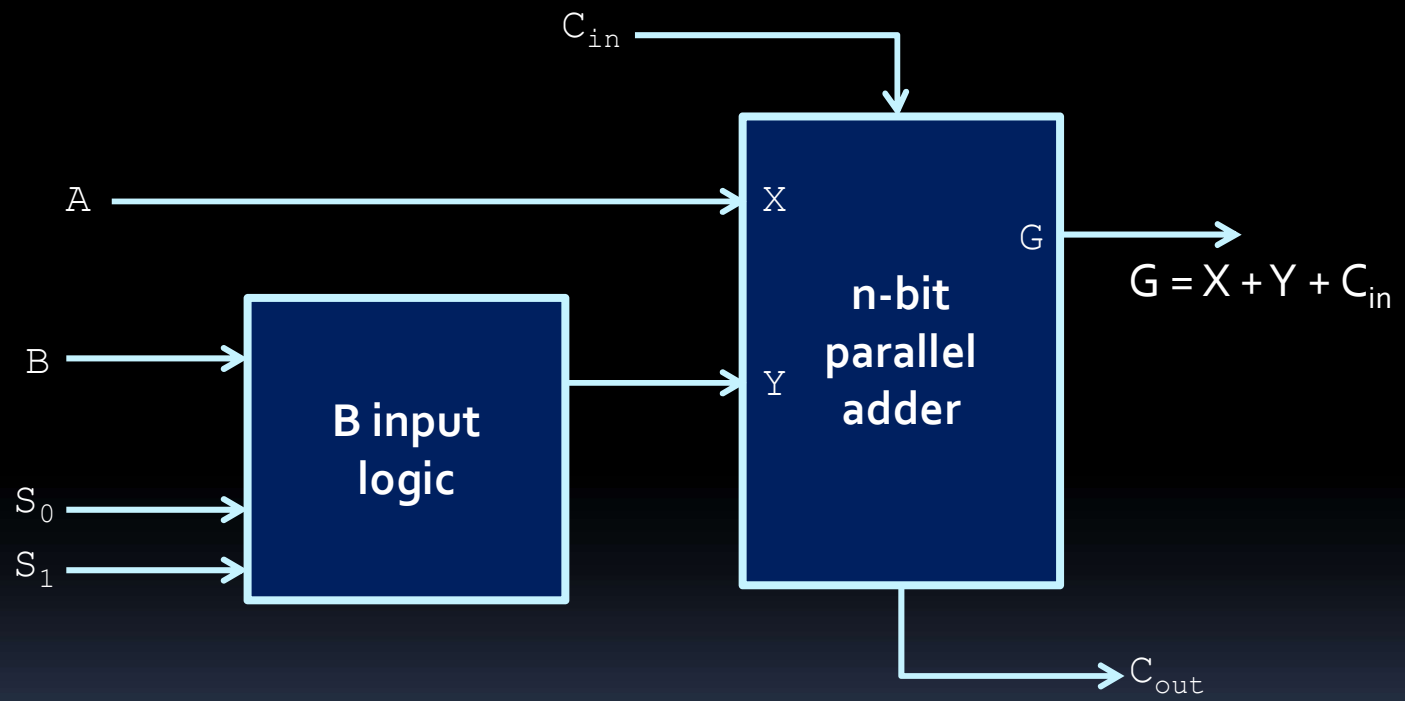
```
     1010
x    1101
---------
     0000
    1101
   0000
  1101
---------
10000010
```

→ 10
→ 13

→ 130

Question #2

- The arithmetic unit of the ALU looks like this:



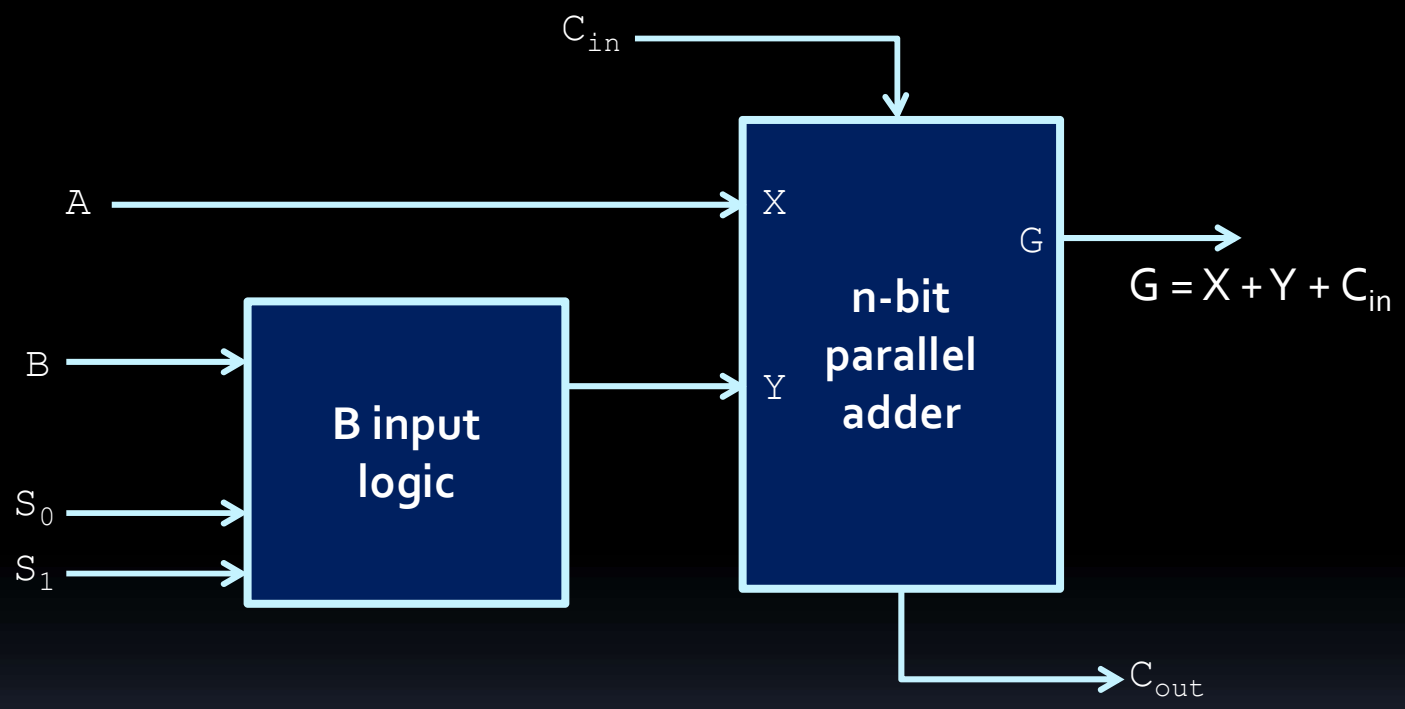
- What values for S_0, S_1 and C_{in} do we need in order to subtract B from A?

Question #2 (cont'd)

- Kind of an unfair question, in that there's a table that fills in some necessary details:

Select		Input	Operation	
S_1	S_0	Y	$C_{in}=0$	$C_{in}=1$
0	0	All 0s	G = A (transfer)	G = A+1 (increment)
0	1	B	G = A+B (add)	G = A+B+1
1	0	$\overline{B}$	G = A+$\overline{B}$	G = A+$\overline{B}$+1 (subtract)
1	1	All 1s	G = A-1 (decrement)	G = A (transfer)

Question #2 (cont'd)



- To subtract B from A, you must set S_0=0, S_1=1 and C_{in}=1.

Question #3

- In an ALU, S_0 and S_1 determine which kind of arithmetic or logical function to perform. But there are 3 select signals that go into the ALU.

  What does S_2 do?

Question #3 (cont'd)