Practice problems

For Exam 1: HW
Bit addition practice problem

What is the result of the following computation on 8-bit two’s complement numbers?

\[ 0b110100101 + 0b011001111 \]

Does it overflow? Justify your answer without converting to binary numbers.

Consider the same computation on unsigned numbers. What is the result? Does it overflow?
Bit addition practice problem: solution

What is the result of the following computation on 8-bit two’s complement numbers?

\[
\begin{array}{c}
110100101 \\
+ 011001111 \\
\hline
001101000
\end{array}
\]

Does not overflow. Justification:

- Inputs have different sign bits (overflow when sign bits are the same and output sign bit differs)
- OR: Carry in and carry out of the most significant bit are the same

Unsigned: same sum (00110100).
- Overflows because carry out of the most significant bit is dropped.
Draw a circuit to implement a switching network. If S=1, the network is in pass-through mode: C=A and D=B. If S=0, the network is in crossing mode: C=B, and D=A.

Use the most reasonable combinational building blocks or gates.
Draw a circuit to implement a switching network. If S=1, the network is in pass-through mode: C=A and D=B. If S=0, the network is in crossing mode: C=B, and D=A.

Use the most reasonable combinational building blocks or gates.