



Comparator For two's Complement

For MSB Comparator

Input $\Rightarrow a, b$

Output $\Rightarrow out_gt, out_eq, out_lt$

$$\begin{aligned}
 out_gt &= a'b \\
 out_eq &= a \oplus b \\
 out_lt &= ab'
 \end{aligned}$$

For Other Bits Comparator

$$\begin{aligned}
 out_gt &= in_gt + (in_eq * a * b') \\
 out_lt &= in_lt + (in_eq * a' * b) \\
 out_eq &= in_eq + (a \oplus b)
 \end{aligned}$$

