Minimization

not always the way to go.

1. Adder
2. Multiplexer
3. De-multiplexer
4. Encoder
5. Decoder

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\[ \text{Sum}_i = A_i \oplus B_i \oplus C_i \]

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\[ A_i, B_i, C_i \]
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If Add → \( A + B + (\overline{\text{Sub}}) \)
If Sub → \( A + \text{comp}(B) + (\overline{\text{Sub}}) \)
Binary coded decimal (BCD)

\[ 0 \rightarrow 0000 \]
\[ 1 \rightarrow 0001 \]
\[ 9 \rightarrow 1001 \]

Out of range
\[ \sum 10, 11, 12, 13, 14, 15 \]

\[ S_3(S_2 + S_1) + C_4 \]