Mathematical formulation

Invertible logic formulation

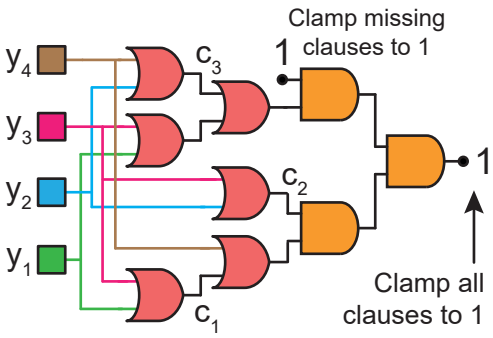
Ising model formulation

Max-SAT

$$\text{maximize} \sum_{c=1}^{N_C} v_c$$

$$\text{with} \quad v_c = y_{c_1} \vee y_{c_2} \vee \ldots \vee y_{c_n}$$

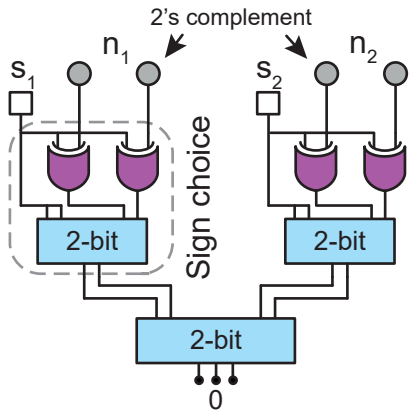
$$v_c \in \{0,1\} \quad y_x \in \{0,1\}$$



Number partitioning

$$\text{minimize} \quad |\sum_{i=1}^{N} s_i n_i|$$

$$\text{with} \quad s_i \in \{-1, +1\}$$



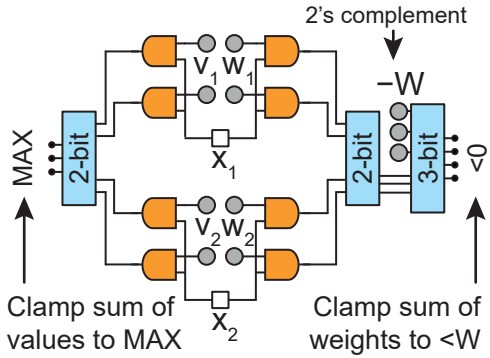
Clamp sum of sets to 0

Knapsack

$$\text{maximize} \sum_{i=1}^{N} v_i x_i$$

$$\text{subject to} \sum_{i=1}^{N} w_i x_i \leq W$$

$$\text{with} \quad \begin{matrix} v_i \geq 0 \\ w_i \geq 0 \end{matrix} \quad x_i \in \{0,1\}$$



Clamp sum of values to MAX

Clamp sum of weights to <W