Sudoku project

Group member: Huidi Wang

I believe linear programming (LP) is a powerful tool since we can write a problem as.

$$\begin{aligned} &\text{maximize} && c^T x \\ &\text{Subject to} && Ax \le b \\ &&& x \ge 0 \end{aligned} \quad \Longleftrightarrow \quad \begin{aligned} &\text{minimize} && b^T y \\ &\text{Subject to} && A^T y \ge c \\ &&& y \ge 0 \end{aligned}$$

Then how Sudoku function:

Column, $\sum_{i=1}^{9} x_{ijk} = 1$ for $1 \le j, k \le 9$

Row, $\sum_{j=1}^{9} x_{ijk} = 1$ for $1 \le i, k \le 9$.

Box. $\sum_{j=3p-2}^{3p} \sum_{i=3q-2}^{3q} x_{ijk} = 1$ for $1 \le k \le 9$, and $1 \le p, q \le 3$

Grid. $\sum_{k=1}^{9} x_{ijk} = 1$ for $1 \le i, j \le 9$