- Let $R \subset \mathbb{Z}$ be the sequence of rows and $C \subset \mathbb{Z}$ be the sequence of columns.
- Let K be the domain for modifiers $K = \{\texttt{ADJ}, \texttt{ROW}, \texttt{COL}\}$.
- Let $A_{c,r,k}$ be the solution matrix for column c, row r and modifier k.
- Let X be a set of points (c, r) which are a subset of the points in A. The points represent non-empty cells.
- Let $\mathrm{hcon}(c, r)$ be the set of horizontally connected cells for $c, r \in X$ except for (c, r).
- Let $\mathrm{vcon}(c, r)$ be the set of vertically connected cells for $c, r \in X$ except for (c, r).
- Let $V(c, r) = \{(c-1, r), (c+1, r), (c, r-1), (c, r+1)\} \cap X$ and then $\mathrm{adj}(c, r) = \sum_{(c',r') \in V(c,r)} A_{c',r',\texttt{ADJ}} * 0.4.$
- Let $\mathrm{row}(c, r) = \sum_{(c',r') \,\in\, \mathrm{hcon}(c,r)} A_{c',r',\texttt{ROW}} * 0.25.$
- Let $\mathrm{col}(c, r) = \sum_{(c',r') \,\in\, \mathrm{vcol}(c,r)} A_{c',r',\texttt{COL}} * 0.25.$
- Let $\mathrm{mul}(c, r) = 1 + \mathrm{adj}(c, r) + \mathrm{row}(c, r) + \mathrm{col}(c, r)$.
- Let big $M = 2.8$.
- Let $\mathrm{unmodified}(c, r) = 1 - \left(\sum_{k \in K} A_{c',r',k} \right).$

$$
\begin{array}{lll}
\text{maximize} & \displaystyle\sum_{(c,r)\in X} w_{c,r} & \\
\text{subject to} & \displaystyle\sum_{k\in K} A_{c,r,k} \le 1, & \forall (c,r) \in X \\
& \displaystyle\sum_{k\in K} A_{c,r,k} = 0, & \forall (c,r) \in (C \times R) - X \\
& w_{c,r} \le \mathrm{mul}(c,r), & \forall (c,r) \in X \\
& w_{c,r} \le M(1 - \displaystyle\sum_{k\in K} A_{c,r,k}), & \forall (c,r) \in X \\
& \displaystyle\sum_{(c',r')\in V(c,r)} \mathrm{unmodified}(c',r') \ge 3 * A_{c,r,\texttt{ADJ}}, & \forall (c,r) \in X \\
& \displaystyle\sum_{(c',r')\in \texttt{hcon}(c,r)} \mathrm{unmodified}(c',r') \ge 5 * A_{c,r,\texttt{ROW}}, & \forall (c,r) \in X \\
& \displaystyle\sum_{(c',r')\in \texttt{vcon}(c,r)} \mathrm{unmodified}(c',r') \ge 5 * A_{c,r,\texttt{COL}}, & \forall (c,r) \in X \\
& A_{c,r,k} \in \{0,1\}, & \forall (c,r) \in C \times R \\
& w_{c,r} \in \mathbb{R}, & \forall (c,r) \in X
\end{array}
$$