$\overline{\textbf{Algorithm 4}: \text{H_cal(init,goal,dir)}}$

```
\begin{array}{l} man\_dist = 0 \\ \textbf{for} \ c \ in \ '12345678' \ \textbf{do} \\ x1,y1 = get\_index(init,c) \\ x2,y2 = get\_index(goal,c) \\ man\_dist += abs(x1 - x2) + abs(y1 - y2) \\ \textbf{end for} \\ return \ man\_dist \end{array}
```