

Q6.

P<sub>2</sub>:  
 $\begin{matrix} 2*7 \\ 156 \\ 483 \end{matrix}$

No, the greedy algorithm not always find a best solution.

Check the best solution stile-search.py produced, by using play-stile.py

# move	Position	Inversions	# move	Position	Inversions
0	$\begin{matrix} 2*7 \\ 156 \\ 483 \end{matrix}$	12	11	$\begin{matrix} 162 \\ 5*3 \\ 478 \end{matrix}$	6
1	$\begin{matrix} *27 \\ 156 \\ 483 \end{matrix}$	12	12	$\begin{matrix} 1*2 \\ 563 \\ 478 \end{matrix}$	4
2	$\begin{matrix} 127 \\ *56 \\ 483 \end{matrix}$	10	13	$\begin{matrix} 12* \\ 563 \\ 478 \end{matrix}$	4
3	$\begin{matrix} 127 \\ 5*6 \\ 483 \end{matrix}$	10	14	$\begin{matrix} 123 \\ 56* \\ 478 \end{matrix}$	2
4	$\begin{matrix} 127 \\ 56* \\ 483 \end{matrix}$	10	15	$\begin{matrix} 123 \\ 5*6 \\ 478 \end{matrix}$	2
5	$\begin{matrix} 12* \\ 567 \\ 483 \end{matrix}$	8	16	$\begin{matrix} 123 \\ *56 \\ 478 \end{matrix}$	2
6	$\begin{matrix} 1*2 \\ 567 \\ 483 \end{matrix}$	8	17	$\begin{matrix} 123 \\ 456 \\ *78 \end{matrix}$	0
7	$\begin{matrix} 162 \\ 5*7 \\ 483 \end{matrix}$	10	18	$\begin{matrix} 123 \\ 456 \\ 7*8 \end{matrix}$	0
8	$\begin{matrix} 162 \\ 57* \\ 483 \end{matrix}$	10	19	$\begin{matrix} 123 \\ 456 \\ 78* \end{matrix}$	0
9	$\begin{matrix} 162 \\ 573 \\ 48* \end{matrix}$	8			
10	$\begin{matrix} 162 \\ 573 \\ 4*8 \end{matrix}$	8			

We noticed, from move #6 to move #7, the inversion increase, it chooses another move that not follows the greedy rule. While, it still get the best solution with minimum moves. Therefore, the greedy algorithm not always find a best solution.