## Enjoy Life



Designed and made by Diniar Namdarian, 2016; sleeve made by J. A. Storer. (laser cut plastic, $3+3 / 8^{\prime \prime}$ high by $5.5^{\prime \prime}$ wide x $3 / 8 "$ thick)
The directions ask one to exchange the upper left orange $E$ with the lower right red $E$ so that "ENJOY" is all red and "LIFE" is all orange:


In the theme of the Fifteen puzzle and Panama Canal puzzles, this is a seemingly impossible problem because of puzzle position parity; from any position, half of the other possible positions are reachable and half are not, and the start and end positions are in opposite halves.
However, there is sufficient free space in this puzzle to make moves that are not the straightforward movement of a piece left or right by a piece width or up and down by a piece height, and this allows two adjacent pieces to be exchanged (which reverses the puzzle parity).

The following pages show four ways to solve the puzzle, all of which fix the parity by effectively exchanging two letters that are adjacent to each other.

The first solution uses rotations to exchange $L$ and $I$.
The other three solutions, using strictly rectilinear moves, move letters incrementally vertically; the first exchanges $L$ and $E$, the second $I$ and the orange $E$, and the third $I$ and the red $E$.

## Enjoy Life Solution, Using Rotations

We use $E$ to denote the red letter E and $e$ to denote the orange letter e.

1. Slide LIFE right, $e$ down, and $N$ left to make:

$$
\begin{array}{lllll}
\mathbf{N} & \cdot & J & O & Y \\
\mathbf{e} & \mathrm{~L} & \mathbf{I} & \mathrm{~F} & \mathrm{E}
\end{array}
$$

2. Then exchange the $L$ and $I$ with non-standard movement:
3. $L$ rotates 90 degrees clockwise and slides up.
2.I slides left and rotates 90 degrees counter clockwise.
4. $L$ rotates 90 degrees counter clockwise and fits next to $J$.
5. I rotates 90 degrees clockwise and slides left.
6. $L$ slides down.
7. With parity reversed, 34 moves can finish the solution:

| $\begin{array}{lllll} \text { \#O } & & & & \\ \mathrm{N} & & \mathrm{~J} & \mathrm{O} & \mathrm{Y} \\ \mathrm{e} & \mathrm{I} & \mathrm{~L} & \mathrm{~F} & \mathrm{E} \end{array}$ | \#1. Move I: N I J O Y e L F E | \#2. Move L: N I J O Y e L F E | \#3. Move F : <br> N I J O Y <br> e L F E | $\begin{array}{\|llll} \hline \# 4 & \text { Move E: } \\ \text { N I } & \text { J O Y Y } \\ \text { e } & \text { L } & \text { F } & \text { E } \\ \hline \end{array}$ |
| :---: | :---: | :---: | :---: | :---: |
| \#5. Move Y : N I J O e L F E Y | \#6. Move 0 : N I J O <br> e L F E Y | \#7. Move E: N I J E O e L F | $\begin{array}{llll} \hline \text { \#8. } & \text { Move } \mathrm{F}: \\ \text { N I } & \text { J E O } \\ \text { e L } & \text { F } Y \end{array}$ | $\begin{array}{\|ccccc} \hline \text { \#9 } & \text { Move J: } \\ \text { N } & I & & E & O \\ \text { e } & \text { L } & \text { J } & \text { F } & Y \\ \hline \end{array}$ |
| $\begin{array}{lllll} \hline \text { \#10. } & \text { Move } & \text { I: } \\ \text { N } & & \text { I } & \text { E } & \text { O } \\ \text { e } & \text { L } & \text { J } & \text { F } & \mathrm{Y} \\ \hline \end{array}$ | $\begin{array}{\|lllll} \hline \text { \#11. } & \text { Move } & \text { L: } \\ \text { N } & \text { L } & \text { I } & \text { E } & \text { O } \\ \text { e } & \text { J } & \text { F } & \text { Y } & \\ \hline \end{array}$ | $\begin{array}{\|rrrrr} \hline \# 12 & \text { Move e: } \\ \text { N L I E O } \\ \text { e J F } & \text { F } & \\ \hline \end{array}$ | $\begin{array}{\|l} \hline \text { \#13. } \\ \hline \text { L I E E O } \\ \text { N } \mathrm{e} \text { J } \mathrm{J} \text { F } \mathrm{Y} \\ \hline \end{array}$ | $\begin{array}{\|lllll} \hline \text { \#14. } & \text { Move } & \text { L: } \\ \text { L } & & \text { I } & \text { E } & \text { O } \\ \text { N } & \text { e } & \text { J } & \text { F } & \text { Y } \\ \hline \end{array}$ |
| $\begin{array}{lllll} \text { \#15 } & \text { Move I: } \\ \text { L I } & \text { E O } & \\ \text { N } & \text { e } & \text { J } & \text { F } & \text { Y } \\ \hline \end{array}$ | $\begin{array}{\|llllll} \hline & \# & 6 & & \text { Move } & \text { E: } \\ \text { L } & \text { I } & \text { E } & & \text { o } & \\ \text { N } & \text { e } & \text { J } & \text { F } & \mathrm{Y} & \\ \hline \end{array}$ | \#17. Move F: <br> LIE F O <br> N e J Y | $\begin{array}{\|lllll} \hline \text { \# 18. } & \text { Move J: } \\ \text { L I E F O } \\ \text { N } & \text { e } & \text { J } & \\ \hline \end{array}$ | $\begin{array}{\|lllll} \hline \text { \#19. Move } & \text { e: } \\ \text { L } & \text { I } & \text { E } & \text { F } & \text { O } \\ \text { N } & \text { e } & \text { J } & \mathrm{Y} \\ \hline \end{array}$ |
| $\begin{array}{llll} \hline \text { \#20. Move I: } \\ \text { L } & \text { E F O } & \\ \text { N I } & \text { e J Y } & \\ \hline \end{array}$ | $\begin{array}{lllll} \text { \#21. } & \text { Move } & \text { E: } \\ \text { L E } & \text { F O } & \\ \text { N I } & \text { e } & \text { J } & \\ \hline \end{array}$ | \#22. Move F: <br> LEF O <br> N I e J Y | \#23. Move J: <br> LEFJO <br> N I e Y | \#24. Move e: <br> LEF J O <br> N I e Y |
| $\begin{aligned} & \text { \#25. Move I: } \\ & \text { L E F J o } \\ & \text { N I e Y } \\ & \hline \end{aligned}$ | $\begin{aligned} & \text { \#26. Move N: } \\ & \text { L E F J o } \\ & \text { N I e Y } \end{aligned}$ | \#27. Move L: <br> E F J O <br> L N I e Y | \#28. Move E: <br> E F J O <br> L N I e Y | $\begin{array}{\|l\|lll} \hline \text { \#29. Move } & \text { N: } \\ \text { E N F J O } \\ \text { L } & \text { I e Y } \\ \hline \end{array}$ |
| $\begin{array}{llll} \hline \text { \#30. } & \text { Move } & \text { I: } \\ \text { E N F J o } \\ \text { L I } & \text { e Y } \\ \hline \end{array}$ | $\begin{array}{llll} \hline \text { \#31. } & \text { Move } & \text { F: } \\ \text { E N } & \text { J o } & \\ \text { L I F e } \mathrm{Y} & \\ \hline \end{array}$ | \#32. Move J: <br> E N J O <br> L I F e Y | \#33. Move O: <br> EN J O <br> LIFeY | \#34. Move Y: <br> E N J O Y <br> LIFe |

## Enjoy Life Solution, Rectilinear Movement Version A (1/2)

Here is a solution of 43 rectilinear moves ( 46 straight-line moves). Positions 23 to 30 change parity by exchanging $L$ and $E$. Notice that moving $e$ down in Position 22 gives a position identical to Position 30, except with $L$ and $E$ exchanged.


## Enjoy Life Solution, Rectilinear Movement Version A (2/2)



## Enjoy Life Solution, Rectilinear Movement Version B (1/2)

Here is another solution of 43 rectilinear moves ( 48 straight-line moves). Positions 26 to 30 change parity by exchanging $I$ and $e$. Notice that moving e up and then $I$ left in Position 25, and moving $I$ left in Position 30, gives identical positions except with $I$ and $e$ exchanged.


## Enjoy Life Solution, Rectilinear Movement Version B (2/2)



## Enjoy Life Solution, Puzzle Directions Solution (1/3)

This solution shown here, provided and copyright by the puzzle maker, uses 43 rectilinear moves (48 straight-line moves). The $I$ is exchanged with the red $E$ in steps 14 to 18 (in Step 18 , if $E$ is move up and $I$ moved left, the position is identical to step 13 with $I$ moved left and $J$ moved up, except with $I$ and $E$ exchanged).


## Enjoy Life Solution, Standard Rectilinear Movement (2/3)



## Enjoy Life Solution, Standard Rectilinear Movement (3/3)



