

Sliding Three



*Designed by the Garbarchuk family; made by Diniar Namdarian 2012, sleeve by J. A. Storer.
(laser cut plastic 3.2" x 5.5" x 3/4", tray and 8 pieces)*

A large piece containing two U-pieces, each covering half a disc, with along the bottom two curved pieces at the left and right and a square in the middle. The discs and bottom three pieces are all 2 units high and wide, the U-pieces are 2 units high by 4 units wide, the big piece is 4 units high by 10 units wide, and the tray interior is 6 units high by 12 units wide.

The puzzle directions show three problems: **Part 1** is to exchange the discs, **Part 2** is to exchange the two U-pieces, and we refer to **Part 3** as going from Part 1 start directly to Part 2 end.

The following pages report solutions for three ways to count moves:

Generalized Rectilinear Moves: One move is *pushing a single piece with one finger*, where that piece may push or drag other pieces with it. A second finger may NOT be used to aid movement, prevent a piece from being dragged to far, etc.

Rectilinear Moves: Generalized rectilinear moves where, except for a group contained by *X*, a piece may not push other pieces.

Restricted Rectilinear Moves: Rectilinear moves with the restriction that for a group contained by *X*, the finger must be placed on *X* and not any of the pieces it contains (further adjustment of a piece inside *X* after the move of *X* is an additional move).

It is worth noting, that Part 2 can be easily solved by employing a combination of rotating and sliding. Slide the discs down, slide the big piece to the right, slide all the other pieces except the two U-pieces to the left and up, and now manipulate the two U-pieces and the right most bottom piece; here are three key positions:



Sliding Three Part 1 Solution

Here is a solution of 31 generalized rectilinear moves, where one move is *pushing a single piece with one finger*, where that piece may push or drag other pieces with it; a second finger may NOT be used to aid movement, prevent a piece from being dragged to far, etc.

If pieces (except for X) are not allowed to push other pieces, move 7 can be replaced by 2 moves and move 26 by three moves for a solution of 34 rectilinear moves. In addition, move 17 can be replaced by two moves for a solution of 35 restricted rectilinear moves.

0: X A A A A B B B B X X A a a A B b b B X L L a a M M b b R R L L M M R R	1. Move a: X A A A A B B B B X X A A A B b b B X L L a a M M b b R R L L a a M M R R	2. Move b: X A A A A B B B B X X A A B B X L L a a M M b b R R L L a a M M b b R R	3. Move X: X A A A A B B B B X X A A B B X L L a a M M b b R R L L a a M M b b R R
4. Move L: L L X X X X X X X X X X L L X X X X X X X X X X X A A A A B B B B X X A A B B X a a M M b b R R a a M M b b R R	5. Move a: L L X X X X X X X X X X L L X X X X X X X X X X a a X A A A A B B B B X a a X A A B B B X M M b b R R M M b b R R	6. Move M: L L X X X X X X X X X X L L X X X X X X X X X X a a X A A A A B B B B X a a X A A B B B X M M b b R R M M b b R R	7. Move R: L L X X X X X X X X X X L L X X X X X X X X X X a a X A A A A B B B B X a a X A A B B B X M M b b R R M M b b R R
8. Move B: L L X X X X X X X X X X L L X X X X X X X X X X a a X A A A A X a a X A A X M M b b R R B B B B M M b b R R B B	9. Move A: L L X X X X X X X X X X L L X X X X X X X X X X a a X A A A A X a a X A A X M M b b R R B B B B M M b b R R B B	10. Move b: L L X X X X X X X X X X L L X X X X X X X X X X a a X b b A A A A X a a X b b A A A X M M R R B B B B M M R R B B	11. Move R: L L X X X X X X X X X X L L X X X X X X X X X X a a X b b R R R A A A A X a a X b b R R R A A X M M B B B B M M B B
12. Move M: L L X X X X X X X X X X L L X X X X X X X X X X a a X b b R R R A A A A X a a X b b R R A A X M M B B B B M M B B	13. Move a: L L X X X X X X X X X X L L X X X X X X X X X X X b b R R R A A A A X X b b R R A A X a a M M B B B B a a M M B B	14. Move L: X b b R R R A A A A X X b b R R A A X L L a a M M B B B B L L a a M M B B	15. Move X: X b b R R R A A A A X X b b R R A A X L L a a M M B B B B L L a a M M B B
16. Move b: X R R A A A A A X X R R A A X L L b b a a M M B B B B L L b b a a M M B B	17. Move X: X R R A A A A A X X R R A A A X L L b b a a M M B B B B L L b b a a M M B B	18. Move L: L L X X X X X X X X X X L L X X X X X X X X X X X R R A A A A A X X R R A A A X b b a a M M B B B B b b a a M M B B	19. Move b: L L X X X X X X X X X X L L X X X X X X X X X X b b X R R A A A A A X b b X R R A A A X a a M M B B B B a a M M B B
20. Move a: L L X X X X X X X X X X L L X X X X X X X X X X b b X a a R R A A A A X b b X a a R R A A X M M B B B B M M B B	21. Move M: L L X X X X X X X X X X L L X X X X X X X X X X b b X a a R R A A A A X b b X a a R R A A A X M M B B B B M M B B	22. Move a: L L X X X X X X X X X X L L X X X X X X X X X X b b X R R A A A A A X b b X R R A A A X M M a a B B B B M M a a B B	23. Move R: L L X X X X X X X X X X L L X X X X X X X X X X b b X R R A A A A A X b b X R R A A A X M M a a R R B B B B M M a a R R B B
24. Move A: L L X X X X X X X X X X L L X X X X X X X X X X b b X A A A A X b b X A A B B X M M a a R R B B B B M M a a R R B B	25. Move B: L L X X X X X X X X X X L L X X X X X X X X X X b b X A A A A B B B B X b b X A A B B X M M a a R R M M a a R R	26. Move M: L L X X X X X X X X X X L L X X X X X X X X X X b b X A A A A B B B B X b b X A A B B X M M a a R R M M a a R R	27. Move b: L L X X X X X X X X X X L L X X X X X X X X X X X A A A A B B B B X X A A A B B X b b M M a a R R b b M M a a R R
28. Move L: X A A A A B B B B X X A A B B X L L b b M M a a R R L L b b M M a a R R	29. Move X: X A A A A B B B B X X A A B B X L L b b M M a a R R L L b b M M a a R R	30. Move a: X A A A A B B B B X X A A B a a B X L L b b M M a a R R L L b b M M R R	31. Move b: X A A A A B B B B X X A b b A B a a B X L L b b M M a a R R L L M M R R

Sliding Three Part 2 Solution (1/2)

Here is a solution of 43 generalized rectilinear moves, where one move is *pushing a single piece with one finger*, where that piece may push or drag other pieces with it; a second finger may NOT be used to aid movement, prevent a piece from being dragged to far, etc.

If pieces (except for X) are not allowed to push other pieces, moves 11, 16, 21, 24, 28, 33 can each be replaced by 2 moves for a solution of 49 rectilinear moves. In addition, moves 14, 30 can each be replaced by two moves for a solution of 51 restricted rectilinear moves.

0: X Y Y X X X X Z Z X X Y X X X X X Z Z X X A A A A B B B B X X A b b A B a a B X L L b b M M a a R R L L M M R R	1. Move a: X Y Y X X X X Z Z X X Y X X X X X Z Z X X A A A A B B B B X X A b b A B B X L L b b M M a a R R L L M M a a R R	2. Move L: X Y Y X X X X Z Z X X Y X X X X X Z Z X X A A A A B B B B X X A b b A B B X L L b b M M a a R R L L M M a a R R	3. Move b: X Y Y X X X X Z Z X X Y X X X X X Z Z X X A A A A B B B B X X A A B B X L L b b M M a a R R L L b b M M a a R R
4. Move X: X Y Y X X X X Z Z X X Y X X X X X Z Z X X A A A A B B B B X X A A B B X L L b b M M a a R R L L b b M M a a R R	5. Move R: X Y Y X X X X Z Z X R R X Y X X X X X Z X R R X A A A A B B B B X X A A B B X L L b b M M a a L L b b M M a a	6. Move a: X Y Y X X X X Z Z X R R X Y X X X X X Z X R R X A A A A B B B B X a a X A A B B X a a L L b b M M L L b b M M	7. Move M: X Y Y X X X X Z Z X R R X Y X X X X X Z X R R X A A A A B B B B X a a X A A B B X a a L L b b M M L L b b M M
8. Move B: X Y Y X X X X Z Z X R R X Y X X X X X Z X R R X A A A A X a a X A A X a a L L b b B B B B M M L L b b B B M M	9. Move A: X Y Y X X X X Z Z X R R X Y X X X X X Z X R R X A A A A X a a X A A X a a L L b b B B B B M M L L b b B B M M	10. Move b: X Y Y X X X X Z Z X R R X Y X X X X X Z X R R X b b A A A A X a a X b b A A X a a L L B B B B M M L L B B B M M	11. Move M: X Y Y X X X X Z Z X R R X Y X X X X X Z X R R X b b A A A A X a a X b b A A X a a L L B B B B M M L L B B M M
12. Move a: X Y Y X X X X Z Z X R R X Y X X X X X Z X R R X b b A A A A X X b b A A X L L B B B B M M a a L L B B M M a a	13. Move R: X Y Y X X X X Z Z X X Y X X X X X Z X X b b A A A A X X b b A A X L L B B B B M M a a R R L L B B M M a a R R	14. Move A: X Y Y X X X X Z Z X X Y X X X X X Z X X b b A A A A X X b b A A X L L B B B B M M a a R R L L B B M M a a R R	15. Move L: X Y Y X X X X Z Z X X Y X X X X X Z X L L X b b A A A A X L L X b b A A X B B B B M M a a R R B B M M a a R R
16. Move M: X Y Y X X X X Z Z X X Y X X X X X Z X L L X b b M M A A A A X L L X b b M M A A X B B B B a a R R B B a a R R	17. Move B: X Y Y X X X X Z Z X X Y X X X X X Z X L L X b b M M A A A A X L L X b b M M A A X B B B B a a R R B B a a R R	18. Move L: X Y Y X X X X Z Z X X Y X X X X X Z X X b b M M A A A A X X b b M M A A X L L B B B B a a R R L L B B a a R R	19. Move X: X Y Y X X X X Z Z X X Y X X X X X Z X X b b M M A A A A X X b b M M A A X L L B B B B a a R R L L B B a a R R
20. Move R: X Y Y X X X X Z Z X X Y X X X X X Z X X b b M M A A A A X R R X b b M M A A X R R L L B B B B a a L L B B a a	21. Move B: X Y Y X X X X Z Z X X Y X X X X X Z X X b b M M A A A A X R R X b b M M A A X R R L L B B B B a a L L B B a a	22. Move M: X Y Y X X X X Z Z X X Y X X X X X Z X X b b A A A A X R R X b b A A X R R L L M M B B B B a a L L M M B B a a	23. Move A: X Y Y X X X X Z Z X X Y X X X X X Z X X b b A A A A X R R X b b A A X R R L L M M B B B B a a L L M M B B a a
24. Move a: X Y Y X X X X Z Z X X Y X X X X X Z X X b b A A A A X R R X b b A A X R R L L M M B B B B a a L L M M B B a a	25. Move R: X Y Y X X X X Z Z X X Y X X X X X Z X X b b A A A A X X b b A A X L L M M B B B B a a R R L L M M B B a a R R	26. Move X: X Y Y X X X X Z Z X X Y X X X X X Z X X b b A A A A X X b b A A X L L M M B B B B a a R R L L M M B B a a R R	27. Move a: X Y Y X X X X Z Z X X Y X X X X X Z X X b b A A A A a a X X b b A A a a X L L M M B B B B a a R R L L M M B B R R
28. Move M: X Y Y X X X X Z Z X X Y X X X X X Z X X b b A A A A a a X X b b A A a a X L L M M B B B B R R L L M M B B R R	29. Move b: X Y Y X X X X Z Z X X Y X X X X X Z X X A A A A a a X X A A a a X L L b b M M B B B B R R L L b b M M B B R R	30. Move A: X Y Y X X X X Z Z X X Y X X X X X Z X X A A A A a a X X A A a a X L L b b M M B B B B R R L L b b M M B B R R	31. Move L: L L X Y Y X X X Z Z X L L X Y X X X X Z Z X X A A A A a a X X A A a a X b b M M B B B B R R b b M M B B R R

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Sliding Three Part 2 Solution (2/2)

<p>32. Move b:</p> <pre>L L X Y Y X X X X Z Z X L L X Y X X X X X Z Z X b b X A A A A a a X b b X A A a a X M M B B B B R R M M B B R R</pre>	<p>33. Move B:</p> <pre>L L X Y Y X X X X Z Z X L L X Y X X X X X Z Z X b b X A A A A a a X b b X A A a a X M M B B B B R R M M B B R R</pre>	<p>34. Move a:</p> <pre>L L X Y Y X X X X Z Z X L L X Y X X X X X Z Z X b b X A A A A X b b X A A X M M B B B B a a R R M M B B a a R R</pre>	<p>35. Move A:</p> <pre>L L X Y Y X X X X Z Z X L L X Y X X X X X Z Z X b b X A A A A X b b X A A X M M B B B B a a R R M M B B a a R R</pre>
<p>36. Move B:</p> <pre>L L X Y Y X X X X Z Z X L L X Y X X X X X Z Z X b b X B B B B A A A A X b b X B B A A X M M a a R R M M a a R R</pre>	<p>37. Move M:</p> <pre>L L X Y Y X X X X Z Z X L L X Y X X X X X Z Z X b b X B B B B A A A A X b b X B B A A X M M a a R R M M a a R R</pre>	<p>38. Move b:</p> <pre>L L X Y Y X X X X Z Z X L L X Y X X X X X Z Z X X B B B B A A A A X X B B A A X b b M M a a R R b b M M a a R R</pre>	<p>39. Move L:</p> <pre> X Y Y X X X X Z Z X X Y X X X X X Z Z X X B B B B A A A A X X B B A A X L L b b M M a a R R L L b b M M a a R R</pre>
<p>40. Move R:</p> <pre> X Y Y X X X X Z Z X X Y X X X X X Z Z X X B B B B A A A A X X B B A A X L L b b M M a a R R L L b b M M a a R R</pre>	<p>41. Move X:</p> <pre> X Y Y X X X X Z Z X X Y X X X X X Z Z X X B B B B A A A A X X B B A A X L L b b M M a a R R L L b b M M a a R R</pre>	<p>42. Move a:</p> <pre> X Y Y X X X X Z Z X X Y X X X X X Z Z X X B B B B A A A A X X B B A a a A X L L b b M M a a R R L L b b M M R R</pre>	<p>43. Move b:</p> <pre> X Y Y X X X X Z Z X X Y X X X X X Z Z X X B B B B A A A A X X B b b B A a a A X L L b b M M a a R R L L M M R R</pre>

Sliding Three Part 3 Solution (1/2)

Here is a solution of 51 generalized rectilinear moves, where one move is *pushing a single piece with one finger*, where that piece may push or drag other pieces with it; a second finger may NOT be used to aid movement, prevent a piece from being dragged to far, etc.

If pieces (except for X) are not allowed to push other pieces, moves 11, 16, 21, 23, 28, 41 can each be replaced by 2 moves for a solution of 57 rectilinear moves. In addition, moves 14, 25, 38 can each be replaced by two moves for a solution of 60 restricted rectilinear moves.

0: X Y Y X X X X Z Z X X Y X X X X X Z X X A A A A B B B B X X A a a A B b b B X L L a a M M b b R R L L M M R R	1. Move a: X Y Y X X X X Z Z X X Y X X X X X Z X X A A A A B B B B X X A A A B b b B X L L a a M M b b R R L L a a M M R R	2. Move R: X Y Y X X X X Z Z X X Y X X X X X Z X X A A A A B B B B X X A A B b b B X L L a a M M b b R R L L a a M M R R	3. Move b: X Y Y X X X X Z Z X X Y X X X X X Z X X A A A A B B B B X X A A B B X L L a a M M b b R R L L a a M M b b R R
4. Move X: X Y Y X X X X Z Z X X Y X X X X X Z X X A A A A B B B B X X A A A B B B X L L a a M M b b R R L L a a M M b b R R	5. Move L: L L X Y Y X X X X Z Z X L L X Y X X X X X Z X X A A A A B B B B X X A A B B X a a M M b b R R a a M M b b R R	6. Move a: L L X Y Y X X X X Z Z X L L X Y X X X X X Z X a a X A A A A B B B B X a a X A A B B X M M b b R R M M b b R R	7. Move M: L L X Y Y X X X X Z Z X L L X Y X X X X X Z X a a X A A A A B B B B X a a X A A B B X M M b b R R M M b b R R
8. Move A: L L X Y Y X X X X Z Z X L L X Y X X X X X Z X a a X B B B B X a a X B B X M M A A A A b b R R M M A A b b R R	9. Move B: L L X Y Y X X X X Z Z X L L X Y X X X X X Z X a a X B B B B X a a X B B X M M A A A A b b R R M M A A b b R R	10. Move b: L L X Y Y X X X X Z Z X L L X Y X X X X X Z X a a X B B B B b b X a a X B B b b X M M A A A A R R M M A A R R	11. Move M: L L X Y Y X X X X Z Z X L L X Y X X X X X Z X a a X B B B B b b X a a X B B b b X M M A A A A R R M M A A R R
12. Move a: L L X Y Y X X X X Z Z X L L X Y X X X X X Z X X B B B B b b X X B B b b X a a M M A A A A R R a a M M A A R R	13. Move L: X Y Y X X X X Z Z X X Y X X X X X Z X X B B B B b b X X B B b b X L L a a M M A A A A R R L L a a M M A A R R	14. Move B: X Y Y X X X X Z Z X X Y X X X X X Z X X B B B B b b X X B B b b X L L a a M M A A A A R R L L a a M M A A R R	15. Move R: X Y Y X X X X Z Z X X Y X X X X X Z X X B B B B b b X R R X B B b b X R R L L a a M M A A A A L L a a M M A A
16. Move M: X Y Y X X X X Z Z X X Y X X X X X Z X X B B B B M M b b X R R X B B M M b b X R R L L a a A A A A R R L L a a A A A	17. Move A: X Y Y X X X X Z Z X X Y X X X X X Z X X B B B B M M b b X R R X B B M M b b X R R L L a a A A A A R R L L a a A A A	18. Move R: X Y Y X X X X Z Z X X Y X X X X X Z X X B B B B M M b b X X B B M M b b X L L a a A A A A R R L L a a A A A R R	19. Move X: X Y Y X X X X Z Z X X Y X X X X X Z X X B B B B M M b b X X B B M M b b X L L a a A A A A R R L L a a A A A R R
20. Move L: X Y Y X X X X Z Z X X Y X X X X X Z X L L X B B B B M M b b X L L X B B M M b b X a a A A A A R R a a A A R R	21. Move A: X Y Y X X X X Z Z X X Y X X X X X Z X L L X B B B B M M b b X L L X B B M M b b X a a A A A A R R a a A A R R	22. Move M: X Y Y X X X X Z Z X X Y X X X X X Z X L L X B B B B b b X L L X B B b b X a a A A A A M M R R a a A A M M R R	23. Move a: X Y Y X X X X Z Z X X Y X X X X X Z X L L X B B B B b b X L L X B B b b X a a A A A A M M R R a a A A M M R R
24. Move L: X Y Y X X X X Z Z X X Y X X X X X Z X X B B B B b b X X B B b b X L L a a A A A A M M R R L L a a A A M M R R	25. Move B: X Y Y X X X X Z Z X X Y X X X X X Z X X B B B B b b X X B B b b X L L a a A A A A M M R R L L a a A A M M R R	26. Move R: X Y Y X X X X Z Z X R R X Y X X X X X Z X R R X B B B B b b X X B B b b X L L a a A A A A M M L L a a A A M M	27. Move M: X Y Y X X X X Z Z X R R X Y X X X X X Z X R R X B B B B b b X M M X B B b b X M M L L a a A A A A L L a a A A
28. Move a: X Y Y X X X X Z Z X R R X Y X X X X X Z X R R X B B B B b b X M M X B B b b X M M L L a a A A A A L L a a A A	29. Move B: X Y Y X X X X Z Z X R R X Y X X X X X Z X R R X b b X M M X b b X M M L L B B B B a a A A A A L L B B a a A A	30. Move b: X Y Y X X X X Z Z X R R X Y X X X X X Z X R R X b b X M M X b b X M M L L B B B B a a A A A A L L B B a a A A	31. Move a: X Y Y X X X X Z Z X R R X Y X X X X X Z X R R X b b a a X M M X b b a a X M M L L B B B B a a A A A A L L B B A A A A

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Sliding Three Part 3 Solution (2/2)

<p>32. Move B: X Y Y X X X X Z Z X R R R X Y X X X X X X Z X R R R X b b B B B B a a X M M X b b B B a a X M M L L A A A A A L L A A A</p>	<p>33. Move A: X Y Y X X X X Z Z X R R R X Y X X X X X X Z X R R R X b b B B B B a a X M M X b b B B a a X M M L L A A A A A L L A A A</p>	<p>34. Move M: X Y Y X X X X Z Z X R R R X Y X X X X X X Z X R R R X b b B B B B a a X X b b B B a a X L L A A A A M M L L A A M M</p>	<p>35. Move R: X Y Y X X X X Z Z X X Y X X X X X Z X X b b B B B B a a X X b b B B a a X L L A A A A M M R R L L A A M M R R</p>
<p>36. Move X: X Y Y X X X X Z Z X X Y X X X X X X Z X X b b B B B B a a X X b b B B a a X L L A A A A M M R R L L A A M M R R</p>	<p>37. Move a: X Y Y X X X X Z Z X X Y X X X X X X Z X X b b B B B B X X b b B B X L L A A A A M M a a R R L L A A M M a a R R</p>	<p>38. Move B: X Y Y X X X X Z Z X X Y X X X X X X Z X X b b B B B B X X b b B B X L L A A A A M M a a R R L L A A M M a a R R</p>	<p>39. Move R: X Y Y X X X X Z Z X R R R X Y X X X X X X Z X R R R X b b B B B B X X b b B B X L L A A A A M M a a L L A A M M a a</p>
<p>40. Move a: X Y Y X X X X Z Z X R R R X Y X X X X X X Z X R R R X b b B B B B X a a X b b B B X a a L L A A A A M M L L A A M M</p>	<p>41. Move A: X Y Y X X X X Z Z X R R R X Y X X X X X X Z X R R R X b b B B B B X a a X b b B B X a a L L A A A A M M L L A A M M</p>	<p>42. Move b: X Y Y X X X X Z Z X R R R X Y X X X X X X Z X R R R X B B B B X a a X B B X a a L L b b A A A A M M L L b b A A M M</p>	<p>43. Move B: X Y Y X X X X Z Z X R R R X Y X X X X X X Z X R R R X B B B B X a a X B B X a a L L b b A A A A M M L L b b A A M M</p>
<p>44. Move A: X Y Y X X X X Z Z X R R R X Y X X X X X X Z X R R R X B B B B A A A A X a a X B B A A X a a L L b b M M L L b b M M</p>	<p>45. Move L: X Y Y X X X X Z Z X R R R X Y X X X X X X Z X R R R X B B B B A A A A X a a X B B A A X a a L L b b M M L L b b M M</p>	<p>46. Move M: X Y Y X X X X Z Z X R R R X Y X X X X X X Z X R R R X B B B B A A A A X a a X B B A A X a a L L b b M M L L b b M M</p>	<p>47. Move a: X Y Y X X X X Z Z X R R R X Y X X X X X X Z X R R R X B B B B A A A A X X B B A A X L L b b M M a a L L b b M M a a</p>
<p>48. Move R: X Y Y X X X X Z Z X X Y X X X X X X Z X X B B B B A A A A X X B B A A X L L b b M M a a R R L L b b M M a a R R</p>	<p>49. Move X: X Y Y X X X X Z Z X X Y X X X X X X Z X X B B B B A A A A X X B B A A X L L b b M M a a R R L L b b M M a a R R</p>	<p>50. Move a: X Y Y X X X X Z Z X X Y X X X X X X Z X X B B B B A A A A X X B B A a a A X L L b b M M a a R R L L b b M M R R</p>	<p>51. Move b: X Y Y X X X X Z Z X X Y X X X X X X Z X X B B B B A A A A X X B b b B A a a A X L L b b M M a a R R L L M M R R</p>