

Just Start, ‘Till Right Implementation Solves (.COM)

ANSWER: UMBRELLA

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The puzzle consists only of a YouTube video with the title “A Modern Take”. The video consists of 8 sections with controller inputs, and 8 screenshots of a Tetris board with black and gray pieces in the board and a few pieces with some squares colored in black on the right.

The title of the puzzle acronyms to JSTRIS, which is a modern online Tetris emulator (found at jstris.jezevec10.com). The title of the video clues that although an NES controller is used to show inputs, modern Tetris mechanics should be used. These include:

1. Hold piece: You can hold a piece to use later. Note that because NES Tetris doesn’t have this feature, the Start button on the NES controller is relabeled “hold”.
2. Bag randomizer: The game generates “bags” containing each of the seven Tetrominoes and pieces are randomly drawn from the bag without replacement until it is empty. Then a new bag is generated, and the process repeats (see [Random Generator](#))

Googling NES Tetris, one can find that the buttons pressed on the controller in the video correspond to valid NES Tetris moves (except for the hold button, whose function is explicitly named). Pressing left and right on the D-pad corresponds to moving a piece left and right, respectively. Pressing the A and B buttons correspond to turning a piece 90 degrees clockwise and counterclockwise, respectively. Pressing the hold button corresponds to holding a piece.

Looking at the video, one can note that between key presses there is either a short or long pause. Transcribing controller inputs, with a space denoting a long pause, gives the following:

1. LLL RR ARRR BLL RR L AR BLLLL RRR RRR
2. B LLL BLL BLLLL BL BBRRR RRR AR RRR BLLL
3. BBRR BRRRR BBLL A BLLLL LL LLL BBLL A L ARR hold ARRRR
4. LLL BBRR A RRRR BBRRR RRRR ALLL hold LLLL BL A hold LLL ALLL ARR
5. LL hold AR BRRRRR AR B hold LLL ARRRR BLLLL BB BRRRR hold RRR
6. hold ARR hold LL hold BLLL R LL hold ARRRR hold ALLL BBR BRRRRR ARRR LLL hold BLLLL
7. AL BRRRRR BBRR ARRRR hold ARRRR R hold RRR ARRRR ARRRR LLL L BBRRR
8. L RRR BLLL RR BBLL RR BLLLL B BRRRR BBR ARRRR hold LLL

From the style of the input display, one should infer that these are controller inputs to an actual game of Tetris. Noting that between long pauses, only one of A and B is pressed and only one of L and R is pressed, this suggests that each consecutive sequence of presses corresponds to one piece being placed.

One should note that the screenshots of Tetris boards between controller inputs resemble what the board might look like at different times while playing. The pieces in black are the pieces that were just placed in the previous segment of controller inputs, whereas the gray pieces are those placed previously. While on Jstris, one should note that the default non-multiplayer game mode is 40-line

sprint. A rough estimation given the number of controller inputs confirms that a 40-line sprint is being played out.

If one counts the number of black squares in the first screenshot, they will notice that there are 48, which corresponds to 12 Tetrominoes. However, they should note that there only seems to be 10 pieces given in the first sequence of controller inputs. However, one should note the only moves given in the video are shift, rotation, and hold moves. Allowing a piece to simply fall to the bottom of the board in the default position would then require no controller inputs. Thus, although there is no indication of when these “null” pieces happen in the input display, they exist somewhere in the sequence of moves. The number of null pieces can be calculated after counting the number of squares that would need to be placed to get from one board state to the next, which is always 12 or 13.

From here, one has enough information to reconstruct the game. Some helpful tips:

1. Keep track of where new bags of Tetrominoes begin.
2. Moves are always optimal, which have several implications:
 - a. The O piece is never rotated.
 - b. The only pieces that can be rotated twice are J, L, and T.
 - c. Rotating an I, S, or Z piece also moves it in that direction (see [SRS](#))...
 - i. Therefore, if a piece has opposite rotation and movement, it must be a J, L, or T piece.
 - d. Only some pieces can move four/five units to the left/right.
3. Pieces fit nicely into the spots they are placed (with only a few exceptions).
4. Piece order is not always significant: it is possible to skip around and build multiple pieces on the left first before tackling those on the right, and vice versa.
5. The final board has no leftover pieces, which means the 40-line sprint ended in a perfect clear, and exactly 100 pieces were placed.

Full reconstructions can be found [here](#). Some things to note:

1. Null pieces have a small range of locations they can belong in.
2. New bags are indicated with a solid line.
3. The piece being placed is indicated next to its moves.
4. The piece being held is indicated next to a hold move, and the piece following is the one that was being held. Thus, the piece following a hold is not always from the current bag.

After reconstructing all the boards, one should keep track of the locations of the pieces placed, including those that were removed during line clears. For each screenshot, one should locate all the pieces that are indicated to the right and color the corresponding squares black. Notice that the pieces are given in default orientation, and the corresponding squares to color should be the same as if performing the moves on the piece. For example, in sequence 2, the top middle square of the S piece is colored black. The first S piece placed was rotated 90 degrees counterclockwise with a B move. This rotation causes the black square to end up on the left.

After coloring in the black squares, a single number (as well as other debris) will appear on each board. The numbers give the sequence 18402477. Browsing Jstris will reveal that eight-digit numbers correspond to replay IDs. Using this sequence, one gets [this replay](#).

At first, the replay appears to be a normal game of Tetris. However, after the first ten pieces result in a perfect clear, the player stops playing normally and begins to move strangely. The next eight pieces are moved with the following sequence of left and right moves:

LLR, RR, RLLL, LRL, L, LRLL, LRLL, LR

After this, a piece is moved from one side of the screen to the other multiple times, then he resumes normal play and finishes the game.

The short sequences of two different symbols remind one of Morse code. Interpreting L's as dots and R's as dashes, one gets UMBRELLA, the solution to this puzzle.