Cohen-Sutherland Line Clipping

In this problem, you are given a clipping window (defining the "viewport") and an example line, and asked to perform the steps of the line clipping algorithm we learned in class (see whiteboard notes on the website). Assume the origin is at the top left and y is increasing going down (like raster).

Input: viewport defined by the lines $x_{min} = 2$, $x_{max} = 10$, $y_{min} = 3$, $y_{max} = 8$.
   line defined by the points $p_1 = (1, 5)$ and $p_2 = (11, 1)$.
Output: p'_1 and p'_2, the points defining the line that should actually be drawn.

1. Draw out the viewport and the example line, labeling p_1, p_2, x_{min}, etc.

2. Write out the binary 4-digit codes for p_1 and p_2.

3. Write out what case each point falls under and show how the algorithm would update the points. What are the final p'_1 and p'_2?

4. Label p'_1 and p'_2 on your picture and make sure they agree visually with your calculations.

5. How many "rounds" of clipping are required to make this example line within the viewport?

(0,0)

x

y