Question 1: Projections

1) Define the horizontal and vertical projection vectors $H$ and $V$ mathematically for a binary image $B(x,y)$.

\[ H = \sum_x B(x,y) \]
\[ V = \sum_y B(x,y) \]

2) Draw the projection vectors $H$ and $V$ for the following image:
Question 2: Flood Fill Vs. Sequential Labeling

An 8x8 binary image is shown below. Each white block represents an object pixel, each back block a background pixel. Start off with the first object pixel on the first row, third column, we label it with ”1” and increment the label for other pixels if needed.

1) Suppose that we want to label the image using Flood Fill Algorithm, we scan the image using a typical raster scan, row by row, top to bottom, left to right. Write down the final labels for each white ”block”.
2) Suppose instead we label the image using Sequential Labeling Algorithm in the same scanning scheme. What will the labels be after completing the scanning for the first time? Note that, for the case when "B" and "C" are labeled with different values, you should label "A" with the minimum value of "B" and "C".