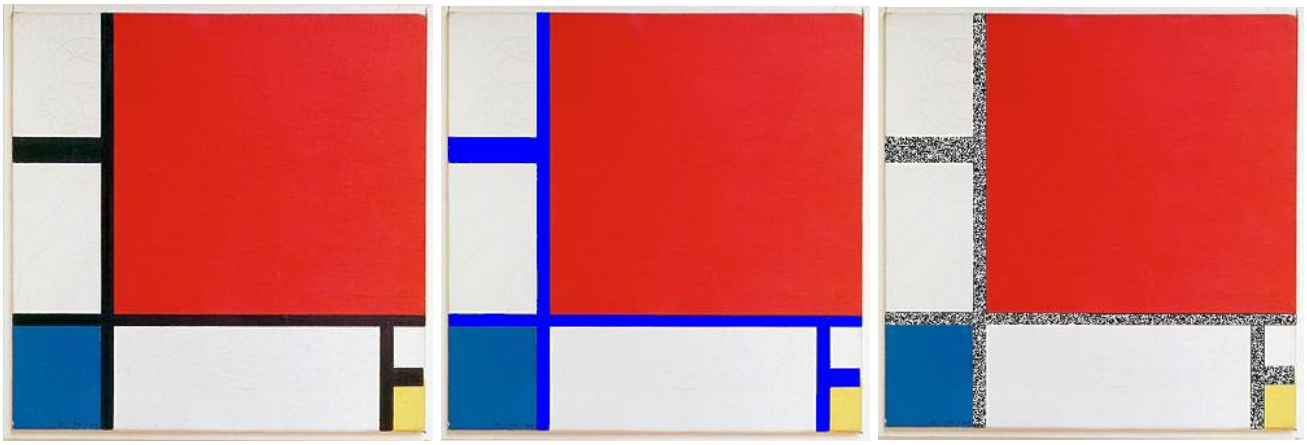
Conditional Pixel Processing in Images

Content based processing

If we need to change pixels based on the content then we can make a copy of the original image, analyze the original image and make changes on the second image based on the analysis. For example, to detect a line or curve drawn with a different color along a certain direction we can follow paths and look for color changes.

Example: **Mark areas that satisfy a condition then replace color.**

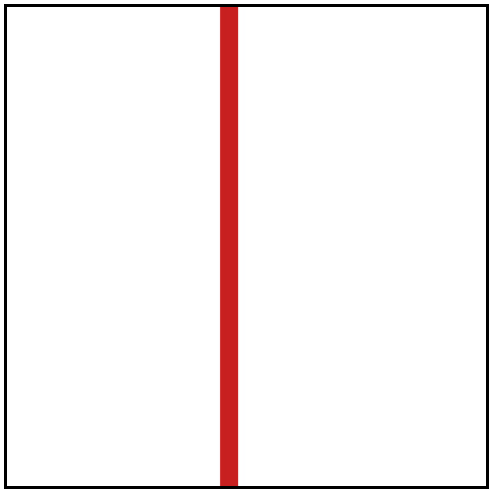


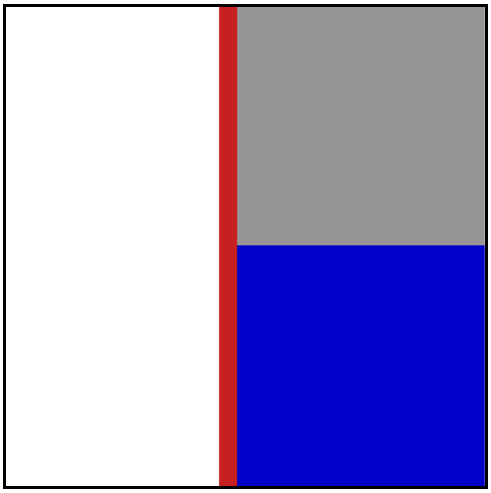
Example: **Replace pixels of a particular color**

To replace a region with a particular color we can check the range and generate a new color in the new image only for those pixels. In the image below, the red color has been altered with random intensities. Other pixels remain unaltered.

Example: **Fill a region with solid color**

Task: Given the image on the left below, fill the upper and lower halves of the region to the right of the line with different colors to obtain the image on the right. For this example assume the line is straight and at 90 degrees with respect to the x axis.





One possible solution:

- Read given image into matrix A, make a copy, call it B.
- Start in the middle row of the leftmost pixel in A.
- Go right one pixel at a time by checking to see if a non-white pixel has been encountered.
    - One way to decide if a pixel is not white would be by averaging the RGB values and checking to see if it is lower than a value of 200, for example. A white pixel will have an average close to 255 (e.g. 225-255).
- When a non-white pixel is encountered proceed to the right to find the first white pixel.
- Once a white pixel is found, go right until the end of the image and for each white pixel in A fill the upper and lower halves with different colors in B.