

MAT1750: An Image Manipulation Challenge

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Problem

The image at <http://drorbn.net/bbs/show?shot=17-1750-171016-111042.jpg> is pathetic. Can you improve it? Whatever you do, should also work well with all other images at <http://drorbn.net/bbs/show.php?prefix=17-1750>.

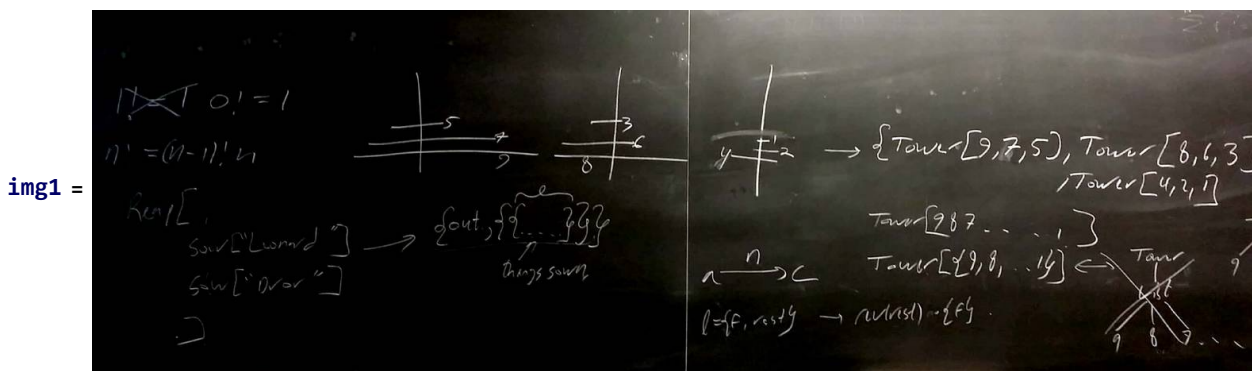
Solution

Using Dror's hints about convolution, we will convolve the image using the *mBlur* convolution matrix to take the average of all the pixels around a given pixel. This will make image blurry. We will then subtract the blurriness from the original image. This will solve our problem. However, we can do better by making the image printable. To save toner and/or ink cartridge costs, we will negate the colour of the image so we have a white background. We will also make the image black and white so we don't waste money on coloured ink (if the printer prints in colour). We can make the image even better by sharpening the image using the *mSharpen* convolution matrix.

```
MakePrintable[img_Image] := Module[{n = 25, mBlur, mSharpen},
  mBlur = ConstantArray[1/n^2, {n, n}];
  mSharpen = {{-1, -1, -1}, {-1, 9, -1}, {-1, -1, -1}};
  ImageConvolve[ColorConvert[ColorNegate[Image[
    ImageData[img] - ImageData[ImageConvolve[img, mBlur]]]], "Grayscale"], mSharpen];
```

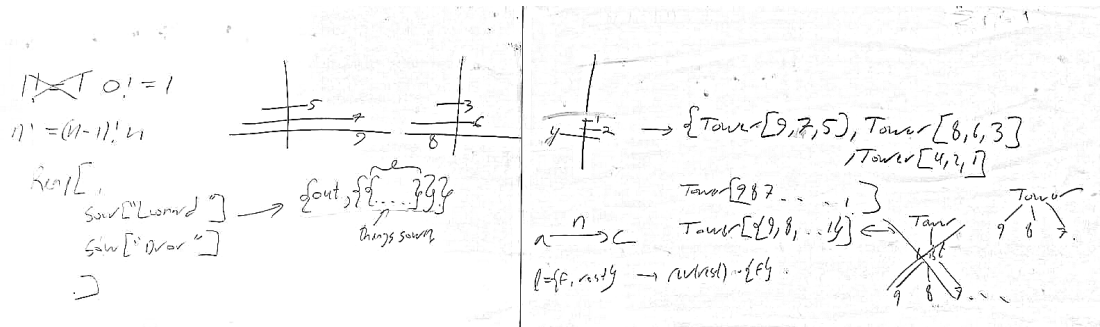
Examples

Here are some examples.

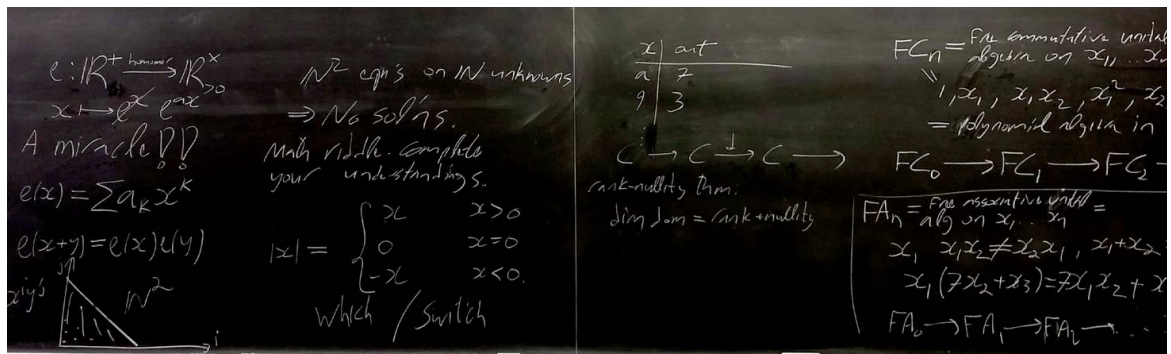


img1 =

MakePrintable [img1]



img2 =



MakePrintable [img2]

