Image Processing – xchs48

Problem 1

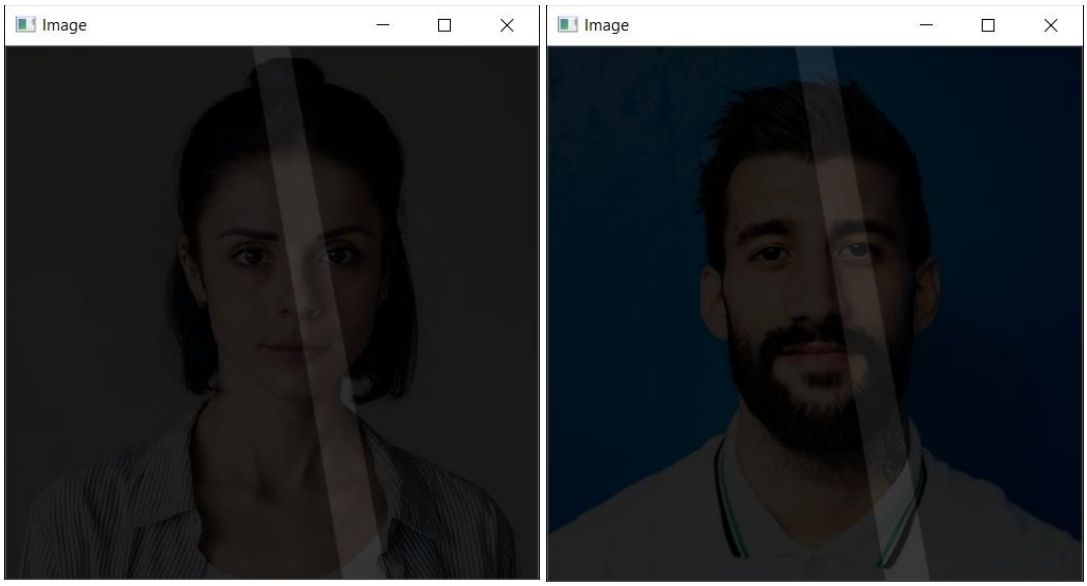
Time complexity: $O(n^2)$

```
problem1(inputFileName, outputFileName, blendCo, darkCo, mode)
```

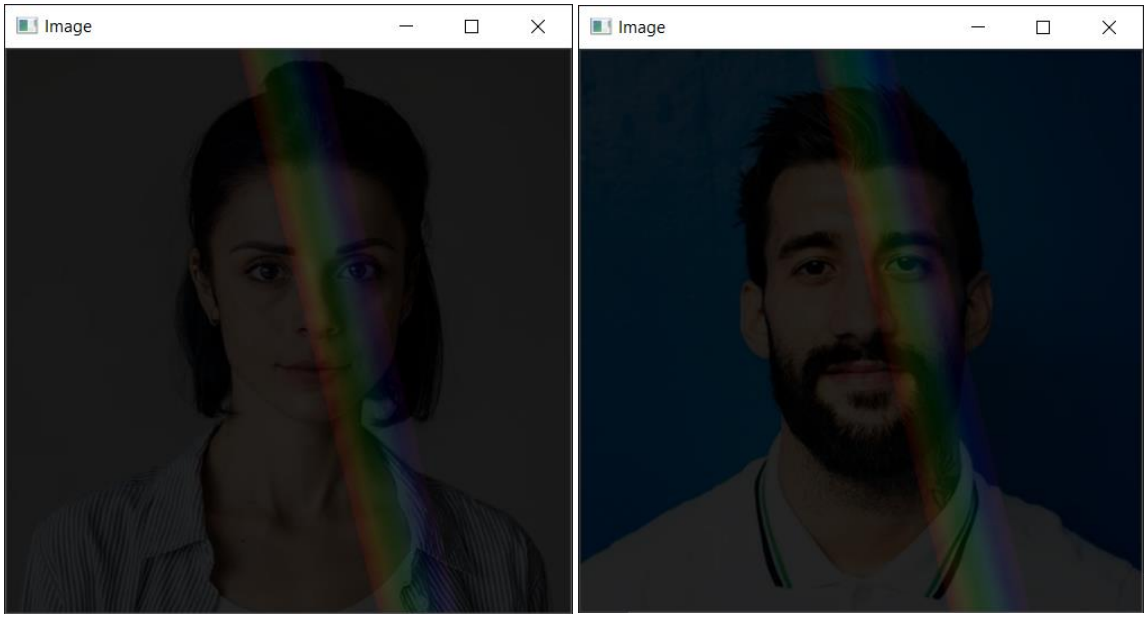
Where:

inputFileName is the file name of the input file.
outputFileName is the name of the file to be saved.
blendCo is the blending coefficient between the mask and the picture.
darkCo is the darkening coefficient.
mode is set to 1 for simple light leak and 2 for rainbow light leak.

Simple



Rainbow



Problem 2

Time complexity: $O(n^2)$

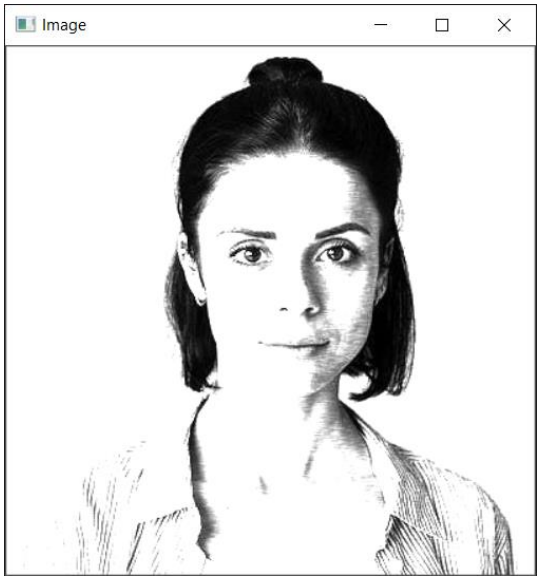
```
problem2(inputFileName, outputFileName, blendCo, maskSize, mode)
```

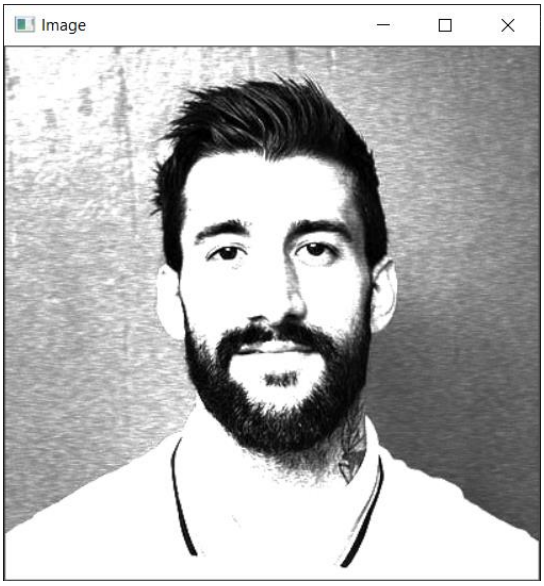
Where:

inputFileName is the file name of the input file
outputFileName is the name of the file to be saved
blendCo is the blending coefficent between the mask and the picture
maskSize is the size of the mask for the motion blur
mode = 1 for greyscale and 2 for colour

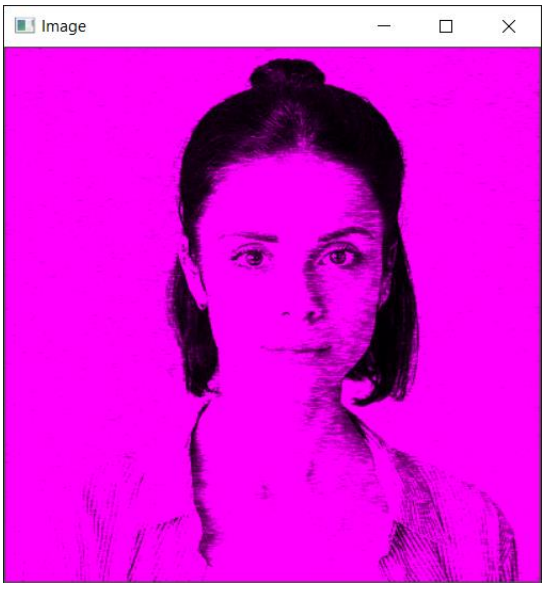
I chose to implement a salt and pepper filter as pencil strokes would need to be randomly distributed throughout the image

Greyscale





Colour



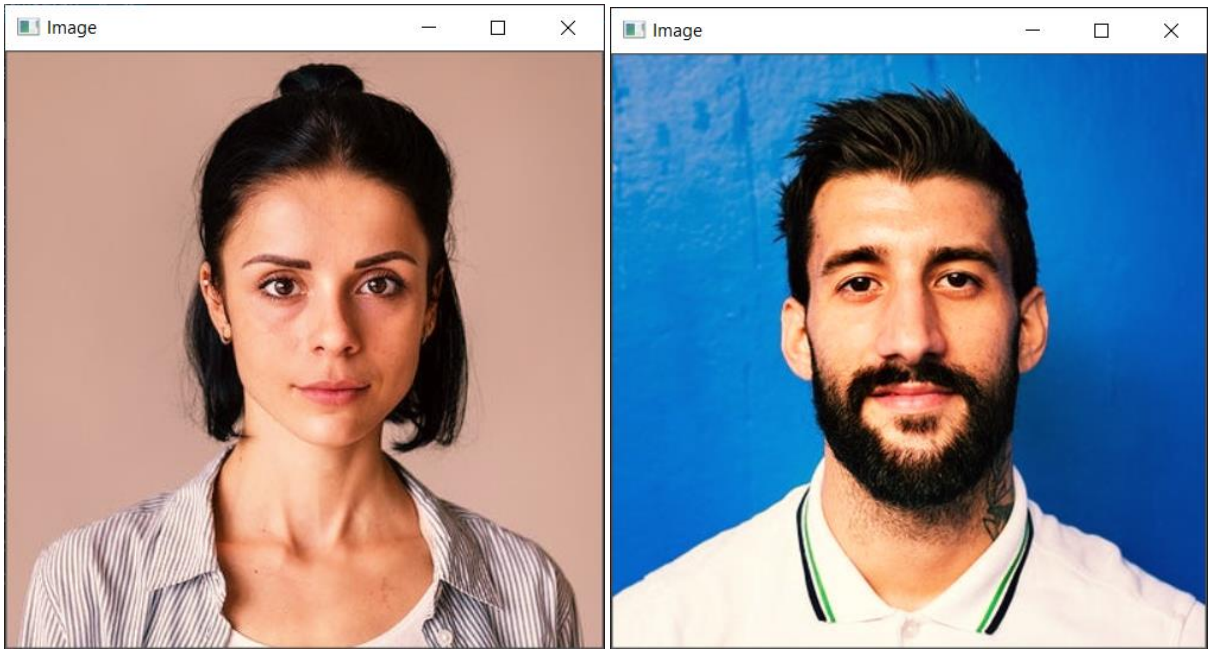
Problem 3

Time complexity: $O(n^2)$

```
problem3(inputFileName, outputFileName)
```

Where:

inputFileName is the file name of the input file.
outputFileName is the name of the file to be saved .



Problem 4

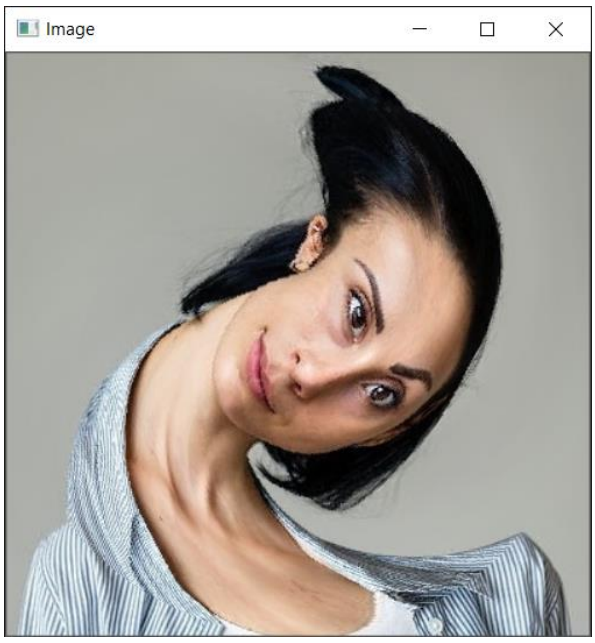
Time complexity: $O(n^2)$

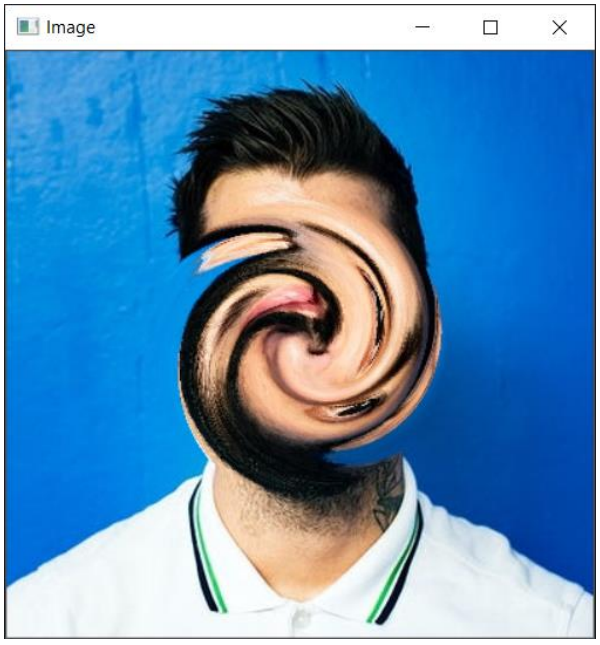
```
problem4(inputFileName, outputFileName, swirlAmount, radius, mode, prefilter)
```

Where:

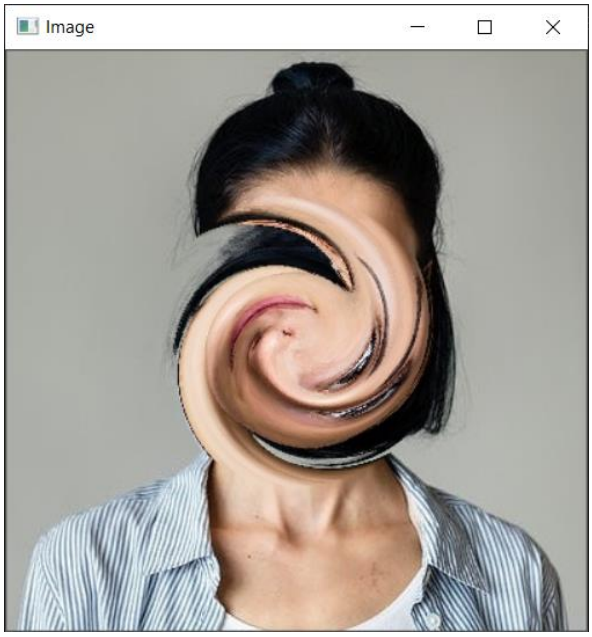
inputFileName is the file name of the input file.
outputFileName is the name of the file to be saved .
swirlAmount is the number of rotations.
radius is the radius of the swirl area.
mode = 1 is nearest neighbour, mode = 2 is bilineal interpolation.
prefilter = 1 is prefilter.

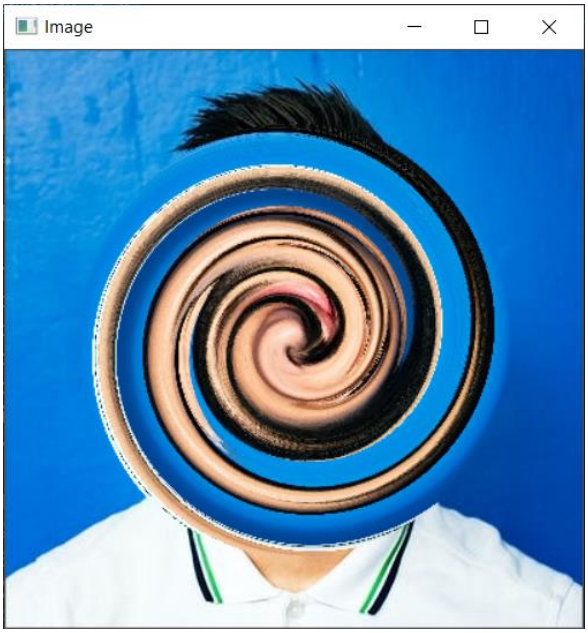
Nearest Neighbour





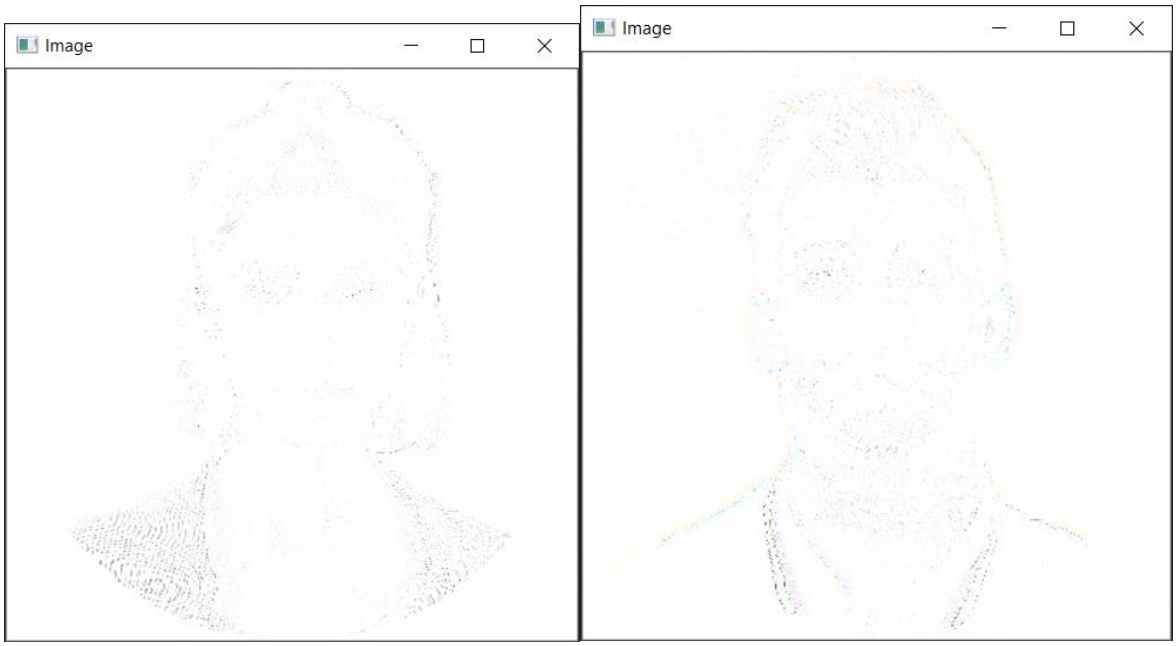
Bilineal Interpolation



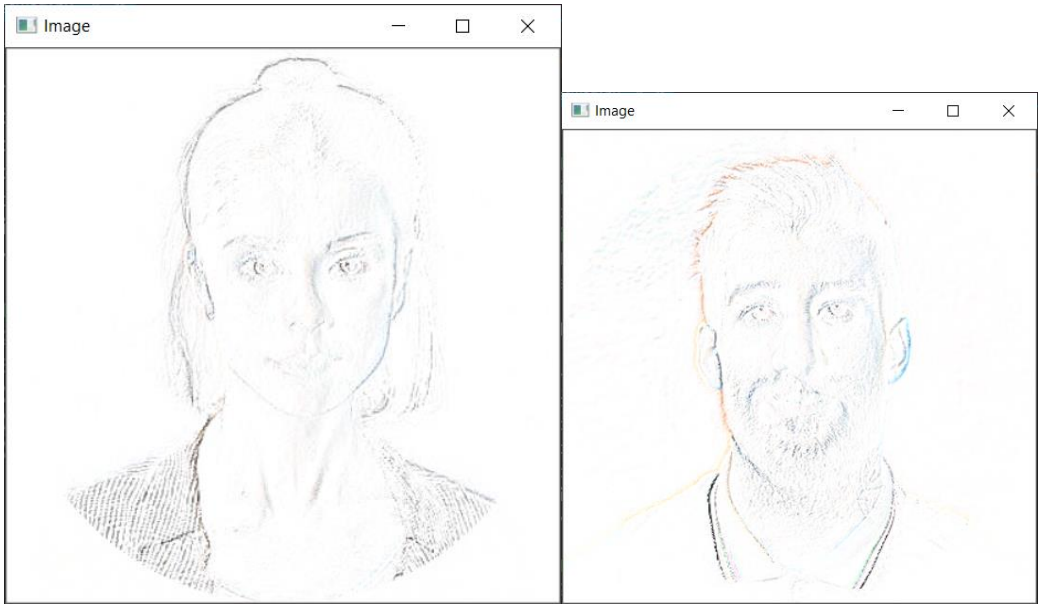


Reversing

Nearest Neighbour



Bilineal Interpolation



Summary

Looking at the two results from reversing the image, nearest neighbour seems to give better results as there are a lot less different pixels, and the bilineal differences appear to be bigger as the pixels after subtracting are darker. As there is both greater detail and darker pixels in the bilineal interpolation images nearest neighbour seems to be better at producing a reversed image.