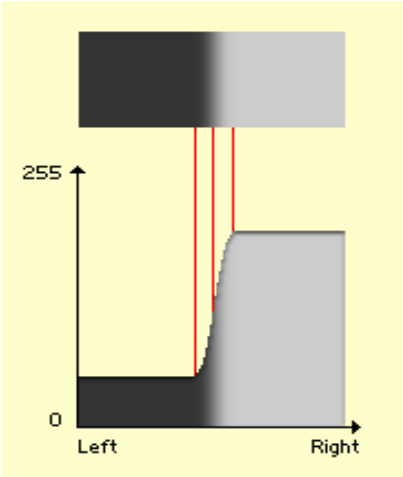
Lets talk Photoshop

Sharpening

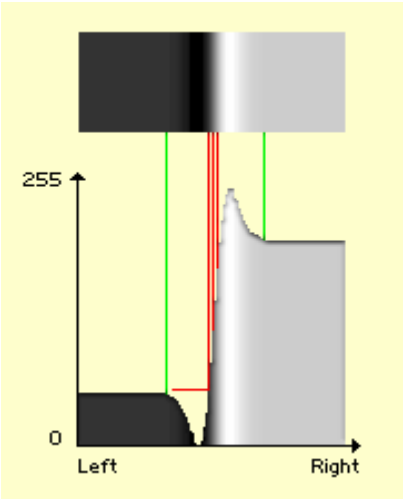
Most (perhaps that should be all) digital photographs need sharpening at some stage and most cameras provide a level of sharpening already built into the camera—some provide the ability to turn this off while with others you are stuck with it. If you are using Adobe "Camera Raw" to import your images into Photoshop then the image is deliberately blurred and then re-sharpened to help reduce any noise—this too can be turned off. My recommendation is to turn off all these automated options and perform your sharpening as part of your post processing.

How does sharpening work?

The term sharpen is a misnomer it is not really a sharpening effect at all, it seeks edges (ie a change in tonal value) in the image and increases the contrast across the transition making the edge more obvious and so, to the eye, look sharper.



When you photograph an edge, because of the design of the optical sensor in the camera, it will rarely be recorded as a solid change it is generally recorded as a ramp. So if we zoom in on an edge, the steps used to create the transition can be seen. It is displayed here graphically to make it easier to understand how the sharpening action works. Black (0) is at the bottom and white (255) is at the top, the red vertical lines indicate the transition.



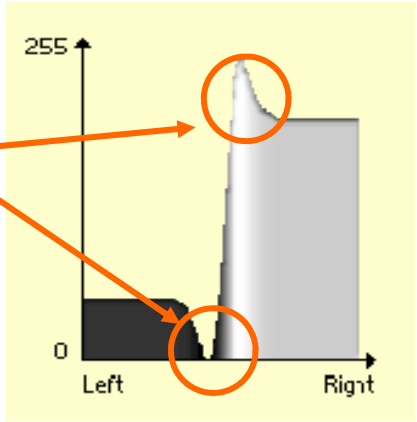
When we apply sharpening to an image it accentuates the light & dark extremes of the ramp and increases the slope on the transition. The more sharpening you apply the more accentuated will be the edge.

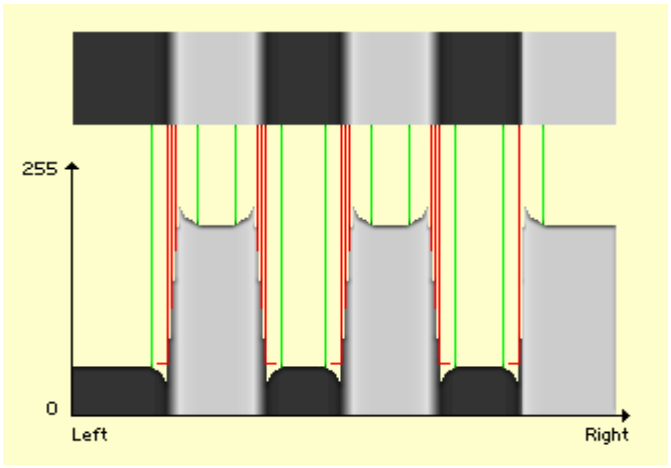
This example shows over sharpening., the green line indicates where the tonal value is back to "normal". The transition has been steepened but it has introduced additional problems:-

- More contrast (ie lack of grey scale).
- Haloes around the edges.
- Colour shift around the edges.
- Degradation of fine detail.

This is not an unusual problem as most images will have areas which are under sharpened, correctly sharpened and over sharpened. The challenge for us is recognising that this will occur and try to minimize the problem.

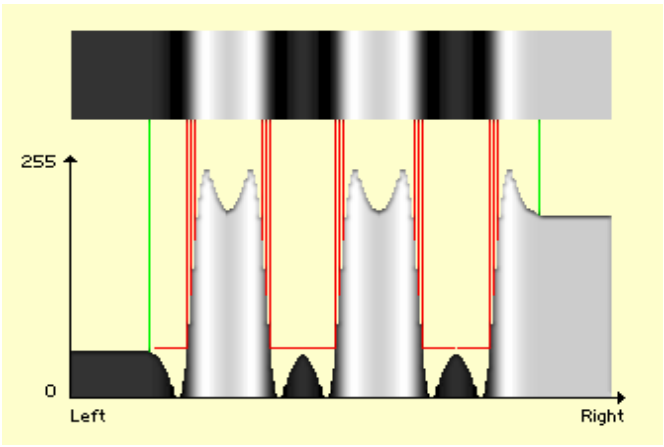
Lets look at the sharpened graphic again.
These sections are the cause of our problems, the height and width result in fine detail being distorted and the creation of the halo and colour shifts.





If we have several adjacent edges which are a short distance apart and a small amount of sharpening is applied. The edges sharpen and achieve the correct grey scale value between the edges. The fine detail is still visible although a small amount of colour shift & halo can be seen.

However if we over sharpen we get an interference between the sharpening actions which results in distortion of the detail plus significant colour shift & halos.



Dealing with various sharpness requirements in an image.

As mentioned earlier it is not unusual for an image to have areas which are under, over and correctly sharpened so when you perform your sharpening copy the image into a layer and perform the sharpening on the layer. This allows you to change the Opacity of the layer to alter the overall level of sharpening. Adding a mask to the sharpened layer allows painting out various areas to alter the level of sharpening you require, if you make a mistake just switch brush colours and paint back the areas where you have accidentally removed the sharpening. You can alter the opacity of the brush to provide finer control to the changes you are masking.

Sharpening methods

There are many methods of sharpening the question is which one is the best. There is no definitive answer however some provide better results in different circumstances. The following is a list of some methods available.

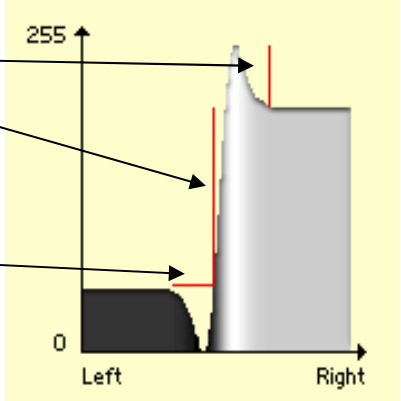
Sharpen, Sharpen More & Sharpen Edges

I don't like these, you have no control over the amount of sharpening that is applied. They are destructive, emphasize noise and can create halos around your photos.

Unsharp Mask

The Unsharp Mask is a very popular sharpening tool, but a downside is it can introduce visible colour noise and halos. You have a degree of control over the sharpening process but it is destructive and you can not change it in the future.

When you open this filter there are three controls:-



- **Amount**—How strongly do you want the action to be applied.
- **Threshold**—Determines how big a step in contrast will have the sharpening applied. The scale is from 0 to 255 (ie black to white). The smaller the number the more edges that are found.
- **Radius**—Determines how wide you want the contrast change to be applied across. The higher the number the more chance there is of introducing haloes.

To use

- Duplicate your layer
- Set the Radius around 1.5 or less (I use 0.9)
- Set the Threshold to 0
- Adjust the Amount so you just prevent the halos appearing.
- Adjust the Threshold (usually no more that 5, I use 1)... this is a balancing act between making it look sharp and magnifying all the imperfections of the image.

Emboss Sharpening

Try this if you have a slightly blurry image. It relies on a blending mode where the neutral colour is grey, the image is made grey, but with distinct edges. The grey is then eliminated by changing the blending mode. This leaves just a sharpening effect which can be fine-tuned.

- Duplicate the layer
- View an important area of the image at 100 per cent
- Change the blending mode of the layers to Hard Light
- Now select Filter > Stylize >Emboss.
- Set Height between 1 and 5. (I use around 2)
- Set amount to around 100.
- Check the effect by toggling the layer's visibility. If it is too strong, adjust the layer's opacity or change blending mode to Soft Light or Overlay.

High Pass Filter

Again try this if your image is slightly out of focus. It too uses a blending mode where the neutral colour is grey. I like this method as it achieves the sharpening effect with reduced halos and noise is not enhanced as much.

- Duplicate the layer
- View an important area of the image at 100 per cent
- Change the blending mode of the layers to Hard Light
- Now select Filter > Other >High Pass.
- Set radius between 2 and 10. (I usually use 2)

Check the effect by toggling the layer's visibility. If it is too strong, adjust the layer's opacity or change blending mode to Soft Light or Overlay

Gaussian Blur

This is very involved but is useful if you can't get a good result from the Emboss or High Pass methods.

- Make 2 copies of the image— called "Darkening".& "Lightening"
  (ie you now have 3 files, the original + two others)
- Open "Lightening" & add two duplicate layers
- Select Filter > Blur > Gaussian Blur
- Set radius to 1.5 pixels to the top layer
- Change the blend mode of the second layer to Darken.
- Change the blend mode of the top layer to Difference
- Flatten the image (Layer > Flatten Image).
- Add two duplicate layers
- Flatten the image and save.

- Open the image called "Darkening".
- Add two duplicate layers.
- Apply a Gaussian Blur of 2.0 to the second layer.
- Set the blend mode of the second layer to Lighten.
- Change the blend mode of the top layer to Difference.
- Flatten the image.
- Invert the image (Filter > Adjustments > Invert).
- Add two duplicate layers and set the blend mode of each to Multiply.
- Flatten the image and save.
- Copy the image to the clipboard (Select > All then Edit > Copy).

- Open the original image
- Paste the clipboard image on top of the original.
- Set the blend mode to multiply.
- Copy the "Lightening" image and paste it on top of the two layers.
- Set the layer blend mode to Screen.
- If necessary, adjust the opacity of each layer.
- Flatten the image and Save As...

Luminosity + Color + Gaussian Blur

This method uses the Luminosity and Color blending modes to eliminate the halos and colour noise around the details.

- Duplicate the layer.
- Change the duplicate layer's blending mode to Luminosity.
- Apply some Gaussian Blur to the Luminosity layer.
- Set an amount of 200—250% with a radius of 1 and threshold of 0.
- Make another duplicate of the original image and drag the new layer to the top of the stack.
- Change the duplicate layer's blending mode to Color.
- Blur the Colour layer using Filter > Blur > Gaussian Blur.
- Set a small amount – 3 or 4 .

Experiment with the Fill Opacity sliders until you achieve a satisfactory sharpening effect.

Hard Mix + Gaussian Blur

Hard Mix reduces an image to just eight colours however, if you apply a small amount of Gaussian Blur to the Hard Mix layer, then there is a noticeable sharpening effect. You can adjust the strength of the sharpening effect by experimenting with the Fill Opacity slider.

- Duplicate the layer
- Change the blending mode to Hard Mix
- Select Filter > Blur > Gaussian.
- Set radius to about 3 to 4.

Experiment with the Fill Opacity slider until you achieve a satisfactory sharpening effect.

Using this method you can crank up the saturation levels and also achieve a sharpening effect but be careful that you don't posterize the image

Vivid Mix + Surface Blur

I find this method results in a significant increase in contrast for the image however if you reduce the Opacity you will get an acceptable result. I sometimes combine this method with the High Pass Filter.

- Duplicate the layer & rename it "Surface Blur"
- Change the blending mode to Vivid Mix
- Invert (Ctrl I)
- Select Filter > Surface Blur.
- Set radius to about 45 and Threshold .to about 40
- Combine the layers (Ctrl + Alt + Shift + E)
- Change the blending mode to Overlay
- Hide (or delete) the "Surface Blur" layer
- Use the Fill Opacity slider until you achieve a satisfactory result.