

- a) Comment on the histogram-equalized images of concert_histeq.jpg, sea1_histeq.jpg and sea2_histeq.jpg.

The global contrast of the original three images has been increased. Areas of lower contrast have gained a higher contrast. For example, in the original concert.jpg file, we aren't able to closely observe whatever is going on in the audience area, as it is very dark, however after histogram equalization we are able to see much of what is going on in the audience area. In the original sea1.jpg, we can see a silhouette of a tree on the right side of the image but not its leaves, whereas in the sea1_histeq.jpg, we can clearly see the tree's leaves. In the original sea2.jpg file, we don't see much details of the sand, however after histogram equalization, we can see the details of the sand, such as the "contours" in the sand and the bumps. Histogram equalization helps to bring out the details within the image that will help people to have a better observation of what is going on in the image.

- b) For sea2_hue.jpg, explain why the horizontal golden strip at the middle of the image appears as a dark strip.

Hue is the attribute that is associated with the color of the pixel and it is measured on a 360 degree scale, ranging from 0 degrees which is red, to 120 degrees which is green, to 240 degrees which is blue and back to red at 360 degrees or 0 degrees. The horizontal golden strip would have a hue value of around 60 degrees. When we store the hue value of the pixels of the horizontal golden strip into our hue file, it would store a pixel with values around (60, 60, 60) which would give it a grey color in the RGB scale. Therefore, the horizontal golden strip at the middle of the image appears as a dark strip in the sea2_hue.jpg file.

- c) For sea2_saturation.jpg, explain why the cloud appears dark.

In the original sea2.jpg image, the clouds have a white/light blue color. Saturation refers to the intensity of the color in the image. The white/light blue color of the clouds will therefore result in a low saturation value. So when we store the saturation value of the clouds as pixels in our saturation file, the pixels store have a value of roughly around (0, 0, 0) which is black in the RGB scale. Therefore, that's why the clouds appear dark in sea2_saturation.jpg.