CS 545 - Homework 5

Written Portion – Daniel Miller

# Problem 3

Convert **RGB** (0, 184, 160) to **HSV**

We begin by calculating the Saturation () as follows:

Next, the Luminance/Value is calculated using the terms above:

Finally, the Hue is calculated as shown here:

Which yields the final answer:

# Problem 4

Convert **HSV** (0.67, 0.7, 0.7) to **RGB**

The conversion from HSV to RGB is calculated as follows:

.02

The (R’, G’, B’) tuple is then normalized to the range [0, 255]:

Which yields the final answer:

# Problem 5

Convert **RGB** (124, 220, 0) to **YIQ**

The R, G, B components are first normalized to the [0, 1] range:

The Luminance (Y) component is then computed, which is shared with the YUV color space.

Which yields the final answer:

# Problem 6

Convert **YIQ** (1.0, 0.3, 0.3) to **RGB**

The matrix form of the previous conversion (RGB to YIQ) is shown here:

The inverse transformation can be calculated using simple matrix math, as shown here:

The results are then scaled down to the [0, 255] range, as shown in the last step of Problem 4. The results show that this conversion has saturated the red and green channels, which are clamped to a maximum value of 255. This yields the final results as: