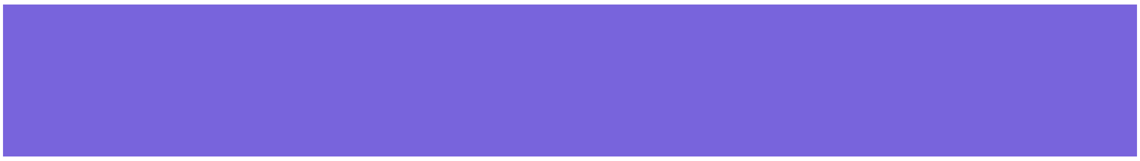
BITL1

Lab 3

18 January 2022

Introduction to Visualization

1. **Warm up:** Look at the color below:



   (a) Search “`rgb color picker`” in Google, and use the tool to find the color as close as possible to the one above.

   (b) Send your RGB code via **private message** in Zoom to me.

2. **Daily Python:** Recall that colors can be represented as hexadecimal numbers with six characters, such as `0F0F0F`.

   (a) Using the built-in function `hex( ... )`, which takes in a positive integer, find the largest integer that corresponds to a hexadecimal color.

   (b) The function below takes in an integer and returns a string formatted as a color that `matplotlib` understands.

```
"#"+"{0:#0{1}x}".format( ... ,8)[2:]
```

   Use it and the function `plt.axvline(x= ... , c= ... )`, which draws a vertical line at the given `x`-position, to draw all the possible hex colors in a plot.

3. **Main task:** Analyzing color distribution in an image

   (a) Find an image on the internet.

   (b) Open it in Python with the `PIL` package and `PIL.Image` command.

   (c) Plot the distribution of the red, green, and blue channels using `matplotlib`.

   (d) Using the CIE formula in the external file, combine the red, green, and blue channels into a single curve.

   (e) Plot the single curve using `matplotlib`. Is there a visible relationship between this single curve and the three separate curves?

   Submit a single image file with your image, the three separate curves, and the combined curve in ORTUS.
   Suggestion: Use `fig, ax = plt.subplots(1,3)` *to plot all three together.*