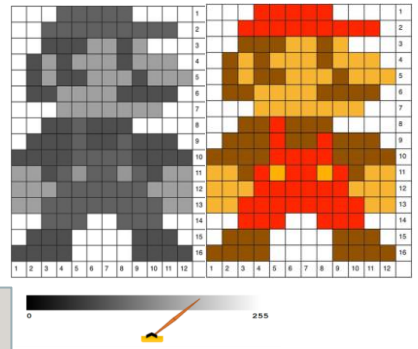
6.1. Creating Images w/ the "Image Generator"

Have you ever mixed colors? How is this process different from what you did before?

What's the value for your favorite color?

1. On your computer desktop, go to the **WebApp**, set grid size, and set it to: Grayscale.

Grayscale images have gray tones that go from white to black in values of 00-FF (hex numbers) or 0-255. ***Which value is the darkest? What's your favorite gray tone?***

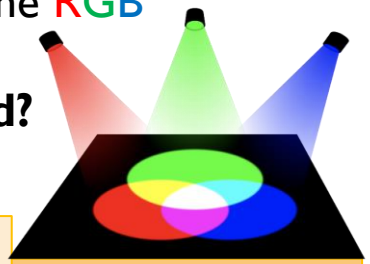


In the columns 'j' enter 4-5 gray tones and talk about how each is formed.

2. Colors are developed through the combination of three color components: Red, Green, and Blue. The value (hex) given to each component determines the RGB combination and the final color.

Why does this RGB value give you red?

"FF0000" = (255, 0, 0) = red



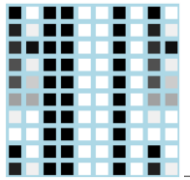
Set image generator in color, create 4-5 colors and talk about how each color is formed.

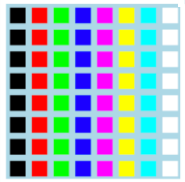
See how colors combine to create new ones.

Take turns writing the codes for all these colors.

3. Create a gray and a color image in **WebApp**. After, scroll down to the Python code and find out how the **images** and **code** (RGB-hex values) are related.

What hex codes make white? Why?

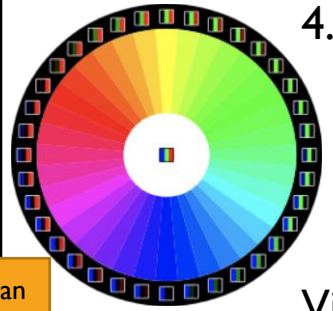




```
[0x30, 0x0F, 0x00, 0x00, 0xFF, 0xFF, 0x00, 0xFF, 0x30, 0x0F], # i=2
[0x50, 0xEE, 0x00, 0x00, 0xFF, 0xFF, 0x00, 0xFF, 0x50, 0xEE], # i=3
[0x50, 0xCC, 0x00, 0x00, 0xFF, 0xFF, 0x00, 0xFF, 0x50, 0xCC], # i=4
[0xA0, 0xAA, 0x00, 0x00, 0xFF, 0xFF, 0x00, 0xFF, 0xA0, 0xAA], # i=5
[0xF0, 0xFF, 0x00, 0x00, 0xFF, 0xFF, 0x00, 0xFF, 0xF0, 0xFF], # i=6
[0xFF, 0xFF, 0x00, 0x00, 0xFF, 0xFF, 0x00, 0xFF, 0xFF, 0xFF], # i=7
```

What's an array?

```
# Definition of the image using a 2D Python array
img = [[0x000000, 0xFF0000, 0x00FF00, 0x0000FF, 0xFF00FF, 0xFFFF00, 0x00FFFF, 0xFFFFFF], # i=0
       [0x000000, 0xFF0000, 0x00FF00, 0x0000FF, 0xFF00FF, 0xFFFF00, 0x00FFFF, 0xFFFFFF], # i=1
       [0x000000, 0xFF0000, 0x00FF00, 0x0000FF, 0xFF00FF, 0xFFFF00, 0x00FFFF, 0xFFFFFF], # i=2
       [0x000000, 0xFF0000, 0x00FF00, 0x0000FF, 0xFF00FF, 0xFFFF00, 0x00FFFF, 0xFFFFFF], # i=3
       [0x000000, 0xFF0000, 0x00FF00, 0x0000FF, 0xFF00FF, 0xFFFF00, 0x00FFFF, 0xFFFFFF], # i=4
       [0x000000, 0xFF0000, 0x00FF00, 0x0000FF, 0xFF00FF, 0xFFFF00, 0x00FFFF, 0xFFFFFF], # i=5
       [0x000000, 0xFF0000, 0x00FF00, 0x0000FF, 0xFF00FF, 0xFFFF00, 0x00FFFF, 0xFFFFFF], # i=6
       [0x000000, 0xFF0000, 0x00FF00, 0x0000FF, 0xFF00FF, 0xFFFF00, 0x00FFFF, 0xFFFFFF]  # i=7
```



4. **Discuss & Write:** How do you make and represent a color? How are gray tones and colors different? How are the color codes of the images related to the columns and rows in the coordinate plane?

Visit HTML color picker for more color code:

You can change the matrix sizes (e.g., 8x8, 10x10) in the image generator!

Experiment, create and write color names and codes to use in your video!!

MATERIALS DEVELOPED BY THE AOLME PROJECT AT THE UNIVERSITY OF NEW MEXICO, PLEASE DO NOT COPY OR DISTRIBUTE ANY OF THESE COPYRIGHTED TASKS WITHOUT PROPER AUTHORIZATION

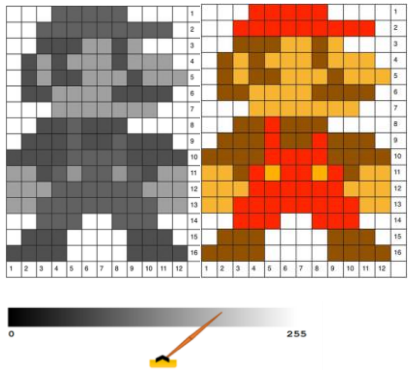
6.1. Creando Imágenes con el "Image Generator"

¿Cuál es el valor de tu color favorito?

¿Alguna vez has mezclado colores?

1. **En** el Raspberry Pi, ve a la carpeta: /pi/AOLME/App10/ y abre "**WebApp**" y configúrala a "Escala de grises".

Las imágenes en escala de grises se crean con valores que van desde 00-FF o 0-255. ***¿Qué valor es el más oscuro? ¿Cuál es tu tono gris favorito?***

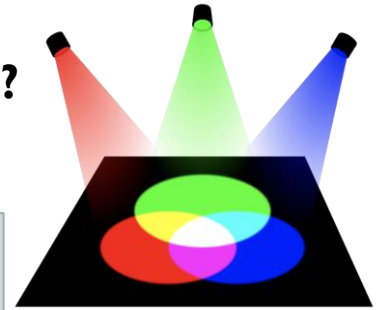


En la columna 'j', ingrese 4-5 tonos grises y comente cómo se forma cada uno.

2. Los colores se crean mediante la combinación de tres componentes de colores: Red, Green, and Blue. El valor otorgado a cada componente determina la combinación RGB y el color final.

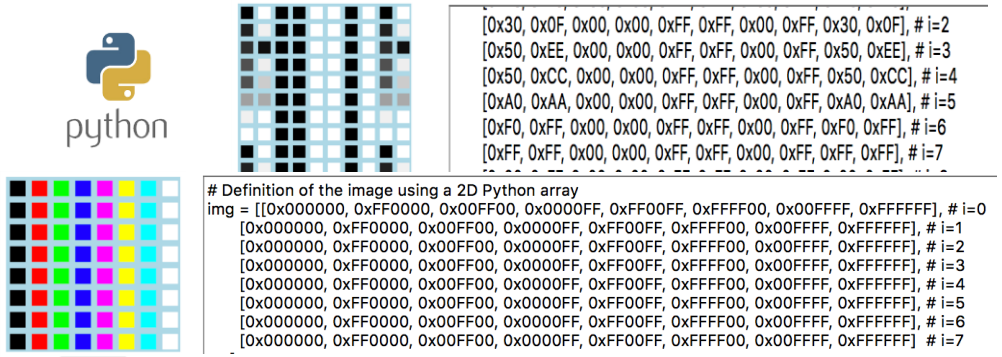
¿Por qué este valor RGB te da rojo?

"FF0000" = (255, 0, 0) = red



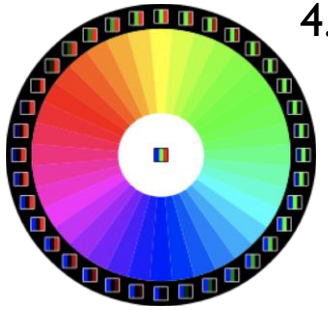
Use el *Image Generator* en color, creen 4-5 colores y comenten sobre cómo se forma cada color.

3. Creen una imagen gris y otra a color en **WebApp**. Luego anlicen el código de Python y descubran cómo se relacionan las **imágenes** y el **código.**



```
[0x30, 0x0F, 0x00, 0x00, 0xFF, 0xFF, 0x00, 0xFF, 0x30, 0x0F], # i=2
[0x50, 0xEE, 0x00, 0x00, 0xFF, 0xFF, 0x00, 0xFF, 0x50, 0xEE], # i=3
[0x50, 0xCC, 0x00, 0x00, 0xFF, 0xFF, 0x00, 0xFF, 0x50, 0xCC], # i=4
[0xA0, 0xAA, 0x00, 0x00, 0xFF, 0xFF, 0x00, 0xFF, 0xA0, 0xAA], # i=5
[0xF0, 0xFF, 0x00, 0x00, 0xFF, 0xFF, 0x00, 0xFF, 0xF0, 0xFF], # i=6
[0xFF, 0xFF, 0x00, 0x00, 0xFF, 0xFF, 0x00, 0xFF, 0xFF, 0xFF], # i=7
```

```
# Definition of the image using a 2D Python array
img = [[0x000000, 0xFF0000, 0x00FF00, 0x0000FF, 0xFF00FF, 0xFFFF00, 0x00FFFF, 0xFFFFFF], # i=0
       [0x000000, 0xFF0000, 0x00FF00, 0x0000FF, 0xFF00FF, 0xFFFF00, 0x00FFFF, 0xFFFFFF], # i=1
       [0x000000, 0xFF0000, 0x00FF00, 0x0000FF, 0xFF00FF, 0xFFFF00, 0x00FFFF, 0xFFFFFF], # i=2
       [0x000000, 0xFF0000, 0x00FF00, 0x0000FF, 0xFF00FF, 0xFFFF00, 0x00FFFF, 0xFFFFFF], # i=3
       [0x000000, 0xFF0000, 0x00FF00, 0x0000FF, 0xFF00FF, 0xFFFF00, 0x00FFFF, 0xFFFFFF], # i=4
       [0x000000, 0xFF0000, 0x00FF00, 0x0000FF, 0xFF00FF, 0xFFFF00, 0x00FFFF, 0xFFFFFF], # i=5
       [0x000000, 0xFF0000, 0x00FF00, 0x0000FF, 0xFF00FF, 0xFFFF00, 0x00FFFF, 0xFFFFFF], # i=6
       [0x000000, 0xFF0000, 0x00FF00, 0x0000FF, 0xFF00FF, 0xFFFF00, 0x00FFFF, 0xFFFFFF]  # i=7
```



4. **Conversen & Escriban:** ¿Cómo se crea y se representa un color?, ¿En qué se diferencian los tonos grises y los colores?, ¿Cómo se relacionan los códigos de color de las imágenes con las columnas y filas en el plano de coordenadas?

¡Puedes cambiar los tamaños de matrices (p. e., 8x8, 10x10) en el generador de imágenes!

MATERIAL DESARROLLADO POR EL PROYECTO AOLME DE LA UNIVERSIDAD DE NUEVO MEXICO. POR FAVOR NO COPIAR NI DISTRIBUIR SU CONTENIDO TOTAL O PARCIAL SIN EXPRESA AUTORIZACIÓN DEL PROYECTO.