Assignment 02

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Question

Write a Python program to create and display 3 shades of the following colors starting from the black color:
white, red, green, blue, cyan, magenta, yellow

Answer

```python
import matplotlib.pyplot as plt
import cv2
import numpy as np

def main():
    h, w = 100, 100
    shades = [0, 31, 63, 127, 255]

    image = np.ones((h, w, 3), np.uint8)
    red, green, blue = image.copy(), image.copy(), image.copy()
    n = 7
    yellow = image.copy()
    cyan = image.copy()
    magenta = image.copy()

    for i, shade in enumerate(shades):
        image = np.ones((h, w, 3), np.uint8) * shade
        plt.subplot(n, len(shades), i + 1)
        plt.title(f"White Shade {i}\n")
        plt.imshow(image)

        red[:, :, 0] = shade
        green[:, :, 1] = shade
        blue[:, :, 2] = shade

        plt.subplot(n, len(shades), i + 1 + len(shades))
        plt.title(f"Red Shade {i}")
        plt.imshow(red)
        plt.axis('off')

        plt.subplot(n, len(shades), i + 1 + 2*len(shades))
        plt.title(f"Green Shade {i}")
        plt.imshow(green)
        plt.axis('off')

        plt.subplot(n, len(shades), i + 1 + 3*len(shades))
        plt.title(f"Blue Shade {i}")
        plt.imshow(blue)
        plt.axis('off')
```

```
        yellow[:, :, 0] = shade
        yellow[:, :, 1] = shade
        plt.subplot(n, len(shades), i + 1 + 4*len(shades))
        plt.title(f"Yellow Shade {i}")
        plt.imshow(yellow)
        plt.axis('off')

        cyan[:, :, 1] = shade
        cyan[:, :, 2] = shade
        plt.subplot(n, len(shades), i + 1 + 5*len(shades))
        plt.title(f"Cyan Shade {i}")
        plt.imshow(cyan)
        plt.axis('off')

        magenta[:, :, 0] = shade
        magenta[:, :, 2] = shade
        plt.subplot(n, len(shades), i + 1 + 6*len(shades))
        plt.title(f"Magenta Shade {i}")
        plt.imshow(magenta)
        plt.axis('off')

    plt.tight_layout()
    plt.subplots_adjust(hspace=0.8, wspace=0.2)
    plt.show()

if __name__ == '__main__':
    main()
```

Output

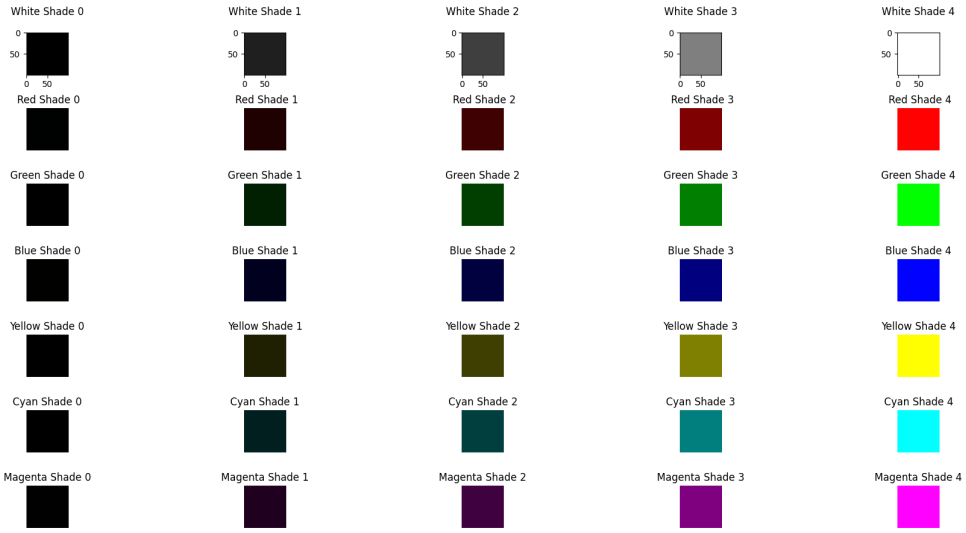

Figure 1: Output of the program showing color shades.