HW1: Cassandra Cabrera and Mike Menendez **Due:** Feb.17, 2020

Summary: This homework was really interesting in terms of testing different skills while still applying the knowledge from class. For task1, we used pickle to read in the image matrix data. We then used 3 for loops to loop through the data from the file and separate the pixels based on their bins and return the count. For task 2, we also used pickle to read in the data, we then looped through the data the same way we did in task 1, but instead we separated the RGB pixels into our RGB lists, sorted them and then passed that into the histogram plotter provided to us. Overall, an interesting homework that was achievable to finish.

Task1:

```
'''
HW1, Task 1
    - Authors: Cassandra Cabrera, Mike Menendez
    - Purpose: To read in pixels and bin the colors accordingly.
'''
import seaborn as sns
import pickle as pk
import matplotlib.pyplot as plt

def read_in():
    print("Enter file path for data source:")
    #uses pickle to read in .dat file
    return pk.load(open(input().strip(), "rb"))

def task1():
    dat = read_in()
    mappy = {
        0: [0, 0, 0, 0],
        1: [0, 0, 0, 0],
        2: [0, 0, 0, 0]
    }
    for x in range(len(dat)):
        for y in range(len(dat[0])):
            for z in range(0, 3):
                if dat[x][y][z] in range(0, 63):
                    mappy[z][0] = mappy[z][0] + 1
                elif dat[x][y][z] in range(64, 127):
                    mappy[z][1] = mappy[z][1] + 1
                elif dat[x][y][z] in range(128, 191):
                    mappy[z][2] = mappy[z][2] + 1
                else:
                    mappy[z][3] = mappy[z][3] + 1

    return {
        "red": mappy[0],
        "green": mappy[1],
        "blue": mappy[2]
    }


def main():
    mappy = task1()
    print("Task 1:", mappy)


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

Results from Task1:

```
(env) Cassandras-MacBook-Pro:1 casscabrera$ python3 hw1_task1.py
Enter file path for data source:
/Users/casscabrera/Desktop/shiny-potato/hw/1/image_matrix.dat
Task 1: {'red': [154805, 198695, 78900, 47600], 'green': [20088, 219446, 176525, 63941],
'blue': [268144, 2029, 575, 209252]}
```

Task2:

```
'''
HW1, Task 2
    - Authors: Cassandra Cabrera, Mike Menendez
    - Purpose: To read in pixels and create a histogram
    based on the usage of each color.
'''
import seaborn as sns
import pickle as pk
import matplotlib.pyplot as plt
from hw1_hist_plotter import hist_plotter as hp

def read_in():
    print("Enter file path for data source:")
    #uses pickle to read in .dat file
    return pk.load(open(input().strip(), "rb"))

def task2(m):
    red = []
    green = []
    blue = []
    for x in range(len(m)):
        for y in range(len(m[0])):
            red.append(m[x][y][0])
            green.append(m[x][y][1])
            blue.append(m[x][y][2])
    red.sort()
    green.sort()
    blue.sort()
    return [red,green,blue]

def main():
    mappy = read_in()
    hp(task2(mappy)) #calls histogram plotter


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

Results from Task2: