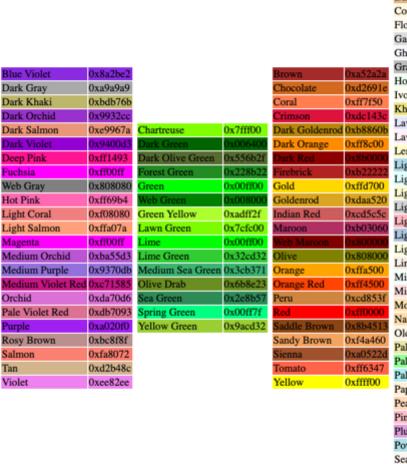
# Color Survey



| Alice Blue       | UXIUI8II |                 |          |                   |
|------------------|----------|-----------------|----------|-------------------|
| Antique White    | 0xfaebd7 |                 |          |                   |
| Azure            | 0xf0ffff |                 |          |                   |
| Beige            | 0xf5f5dc |                 |          |                   |
| Bisque           | 0xffe4c4 |                 |          |                   |
| Blanched Almond  | 0xffebcd |                 |          |                   |
| Burlywood        | 0xdeb887 |                 |          |                   |
| Cornsilk         | 0xfff8dc |                 |          |                   |
| Floral White     | 0xfffaf0 |                 |          |                   |
| Gainsboro        | 0xdcdcdc |                 |          |                   |
| Ghost White      | 0xf8f8ff |                 |          |                   |
| Gray             | 0xbebebe |                 |          | Aqua              |
| Honeydew         | 0xf0fff0 |                 |          | Aquamarine        |
| Ivory            | 0xfffff0 |                 |          | Cadet Blue        |
| Khaki            | 0xf0e68c |                 |          | Cornflower Blue   |
| Lavender         | 0xe6e6fa |                 |          | Cyan              |
| Lavender Blush   | 0xfff0f5 |                 |          | Dark Cyan         |
| Lemon Chiffon    | 0xfffacd | Blue            | 0x0000ff | Dark Sea Green    |
| Light Blue       | 0xadd8e6 | Dark Blue       | 0х00008Ъ | Dark Turquoise    |
| Light Cyan       | 0xe0ffff | Dark Magenta    | 0x8b008b | Deep Sky Blue     |
| Light Goldenrod  | 0xfafad2 | Dark Slate Blue | 0x483d8b | Dodger Blue       |
| Light Gray       | 0xd3d3d3 | Dark Slate Gray | 0x2f4f4f | Light Green       |
| Light Pink       | 0xffb6c1 | Dim Gray        | 0x696969 | Light Sea Green   |
| Light Steel Blue | 0xb0c4de | Indigo          | 0x4b0082 | Light Sky Blue    |
| Light Yellow     | 0xffffe0 | Medium Blue     | 0x0000cd | Light Slate Gray  |
| Linen            | 0xfaf0e6 | Midnight Blue   | 0x191970 | Medium Aquamari   |
| Mint Cream       | 0xf5fffa | Navy Blue       | 0x000080 | Medium Slate Blue |
| Misty Rose       | 0xffe4e1 | Web Purple      | 0x800080 | Medium Spring Gr  |
| Moccasin         | 0xffe4b5 | Rebecca Purple  | 0x663399 | Medium Turquoise  |
| Navajo White     | 0xffdead | Teal            | 0x008080 | Royal Blue        |
| Old Lace         | 0xfdf5e6 |                 |          | Sky Blue          |
| Pale Goldenrod   | 0xeee8aa |                 |          | Slate Blue        |
| Pale Green       | 0x98fb98 |                 |          | Slate Gray        |
| Pale Turquoise   | 0xafeeee |                 |          | Steel Blue        |
| Papaya Whip      | 0xffefd5 |                 |          | Turquoise         |
| Peach Puff       | 0xffdab9 |                 |          |                   |
| Pink             | 0xffc0cb |                 |          |                   |
| Plum             | 0xdda0dd |                 |          |                   |
| Powder Blue      | 0xb0e0e6 |                 |          |                   |
| Seashell         | 0xfff5ee |                 |          |                   |
| Silver           | 0xc0c0c0 |                 |          |                   |
| Snow             | 0xfffafa |                 |          |                   |
| Thistle          | 0xd8bfd8 |                 |          |                   |
| Wheat            | 0xf5deb3 |                 |          |                   |
| White            | 0xffffff |                 |          |                   |
| White Smoke      | 0xf5f5f5 |                 |          |                   |
|                  |          |                 |          |                   |

Results of a simple color categorization using k-means clustering in Python

Alice Blue

0xf0f8ff

[The graphic is the output of an assignment for a 2nd quarter class in Python. It's not related to this 3400 assignment.]

# Summary

In this assignment, you will be tabulating results of a survey where people were asked to vote for their top three favorite colors (in order). The results of the survey are stored in an input file that has one or more lines in the following format:

blue green red

- Each line refers to one survey response.
- The first color listed is the favorite color (call this a 1<sup>st</sup> place vote). The second color listed is the second favorite color (call this a 2<sup>nd</sup> place vote). The third color listed is the third favorite color (call this a 3<sup>rd</sup> place vote).
- The colors are separated by a single space.
- Each color is a single word consisting of only lowercase letters.

### **Directions**

You must create the following functions in the file hw1.py.

#### process file

<u>Parameters</u>: Name of the input file (string)

<u>Returns</u>: A dictionary consisting of key-value pairs where the key is string and the value is a tuple consisting of three integers.

<u>Description</u>: Reads and parses the input file. Creates and returns a dictionary consisting of key-value pairs where the key is a color and the value is a tuple consisting of three integers: (number of 1<sup>st</sup> place votes, number of 2<sup>nd</sup> place votes, number of 3<sup>rd</sup> place votes). The dictionary only contains colors that appeared in the file.

<u>Assumptions</u>: The input file exists and is formatted as described above. The input file contains at least one line.

### get\_first\_place\_votes

<u>Parameters</u>: Dictionary returned from *process\_file*, color (string)

Returns: Integer.

<u>Description</u>: Returns the number of 1<sup>st</sup> place votes (possibly zero) for the provided color.

Additional Restrictions: You must not use a loop in this function.

## create\_favorite\_color\_list

<u>Parameters</u>: Dictionary returned from *process\_file* 

Returns: A list of strings.

<u>Description</u>: Returns an ordered list of colors based on the number of 1<sup>st</sup> place votes. The first item in the list is the color that had the most 1<sup>st</sup> place votes. The second item in the list is the color that had the second most 1<sup>st</sup> place votes. The list only contains colors that receive at least one 1<sup>st</sup> place vote. Ties are broken as follows: 1) winner is the color with higher number of 2<sup>nd</sup> place votes, 2) if still tied, winner is the color that appears earlier in alphabetical order.

### create\_color\_score\_dict

Parameters: Dictionary returned from process\_file

Returns: A dictionary consisting of key-value pairs where the key is a string and the value is an integer.

<u>Description</u>: Creates and returns a dictionary consisting of key-value pairs where the key is a color and the value is an integer that is computed using the following formula (number of  $1^{st}$  place votes x 3) + (number of  $2^{nd}$  place votes x 2) + (number of  $3^{rd}$  place votes). The dictionary only contains colors that appeared in the file.

#### print\_dictionary

Parameters: Any dictionary

Returns: nothing

<u>Description</u>: Prints the dictionary in sorted order (use *sorted* function). Print each entry on a separate line

in the following format:

key: value

Additional Restrictions: You can make no assumptions on the type of dictionary.

#### **Top-Level Functionality**

In addition to these functions, you must do the following steps to create a simple test driver. This code should reside outside the functions:

- 1. Get the name of an input file from the command line (using *sys.argv*). WARNING: Do not prompt the user for a file name.
- 2. Call process\_file with the file name from step 1 storing its result.
- 3. Call *print\_dictionary* to print the result from step 2 to the screen.
- 4. Call get\_first\_place\_votes with blue storing its result.
- 5. Print the result from step 4 to the screen.
- 6. Call *get\_first\_place\_votes* with *green* storing its result.
- 7. Print the result from step 6 to the screen.
- 8. Call create\_favorite\_color\_list storing its result.
- 9. Print the result from step 8 to the screen.
- 10. Call *create\_color\_score\_dict* storing its result.
- 11. Call print\_dictionary to print the result from step 10 to the screen.

# Sample Input File and Output

Assuming there is a sample color file as shown:

\$ cat sample1.txt red white blue blue yellow green blue purple pink green yellow red blue pink green green purple black red green blue yellow pink brown blue white black purple pink green green black red red green white

```
purple red green
$ python3 hw1.py sample1.txt
black: (0, 1, 2)
blue: (4, 0, 2)
brown: (0, 0, 1)
green: (3, 2, 4)
pink: (0, 3, 1)
purple: (2, 2, 0)
red: (3, 1, 2)
white: (0, 2, 1) yellow: (1, 2, 0)
['blue', 'green', 'red', 'purple', 'yellow'] black: 4
blue: 14
brown: 1
green: 17
pink: 7
purple: 10
red: 13
white: 5
yellow: 7
```

IMPORTANT! Do not assume that testing is complete if your program produces the correct output for this provided input file. During grading, your assignment will be tested with other input files.

# **Grading Notes**

- A test that crashes due to a run-time exception will be considered a failing test.
- Programs that contain syntax errors will receive a zero.

#### Version

• Last updated 05-Jan-2022

#### **HW1 Rubric**

| Criteria   | Ratings                 |                               |                             |                    |                      | Pts    |
|--|-------------------------|-------------------------------|-----------------------------|--------------------|----------------------|--------|
| process_file   | 10 pts<br>Full<br>Marks | 8 pts<br>Passes<br>most tests | 5 pts<br>Passes<br>some tes | 2 pts<br>Attempted | 0 pts<br>No<br>Marks | 10 pts |
| get_first_place_votes  | 6 pts<br>Full<br>Marks  | 5 pts<br>Passes<br>most tests | 3 pts Passes some tes       | 1 pts<br>Attempted | 0 pts<br>No<br>Marks | 6 pts  |
| create_favorite_color_list   | 12 pts<br>Full<br>Marks | 9 pts<br>Passes<br>most tests | 6 pts Passes some tes       | 2 pts<br>Attempted | 0 pts<br>No<br>Marks | 12 pts |
| create_color_score_dict  | 10 pts<br>Full<br>Marks | 8 pts<br>Passes<br>most tests | 5 pts<br>Passes<br>some tes | 2 pts<br>Attempted | 0 pts<br>No<br>Marks | 10 pts |
| print_dictionary   | 6 pts<br>Full<br>Marks  | Full Passes Passes            |                             | 1 pts<br>Attempted | 0 pts<br>No<br>Marks | 6 pts  |
| Other functionailty, style, and documentation Follows PEP-8 style guide. Has suitable docstrings for module and each function. |                         |                               |                             | 0 pts<br>No Marks  |                      | 6 pts  |

Total Points: 50