**Project Color Palette Generator**

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This is version 1.0 of this document. Watch for future revisions. All such revisions will supersede the content of this document.

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**Abstract**

Color Palette’s are important for branding, cohesiveness, etc. Giving them names makes them referable. Naming colors is a difficult challenge because different people interpret colors differently. This project explores the different associations English speakers have with certain colors and how those ties can be used to name randomly generated color palettes.

**Online Access**

Provide here a link to the online manifestation of your project, if any. This may be a URL, a Twitter handle, etc. If you have a public *Github* for your project, also provide access details here

**1. Introduction**

This project produces a color palette of randomly chosen colors and gives that generated palette a name. The name produced is based on cultural associations English speakers have with the colors present in the generated palette. The aim of this project is to produce a name for the generated palette that is familiar but not obvious.

**2. The Core Idea**

Color palettes are important to humans because colors are important to us. We all have our own ideas tied to the colors we see in the world and different understandings of those colors. Often, cultural influences cause people within that cultural to have similar associations with colors. Thus, people and companies will leverage those associations in branding, interior décor, and other likewise settings to draw certain emotions from those interacting with their subject.

When companies are choosing a color palette for their brand, or interior designers are choosing colors to fill a room with, they have endless options. This project aims to produce color palettes they could use, as well as names for the color palettes. By naming the palettes, they are not only more easily referable, but also more memorable. Through the compilation of associations made with colors, we can produce names based on the colors generated in the palette.

While the English language has eleven basic words for colors (black, white, red, green, yellow, blue, pink, grey, brown, orange and purple), that is not the case for all languages. For example, both Greek and Russian have two separate words to distinguish between light blue and dark blue. In short, the language you speak affects how you view and understand color.

**3. Technical Approach: Architectural Perspective**

Even amongst English speakers, we have our own biases and cultural backgrounds that influences how we categorize a color. One of the biggest challenges of this project was compiling examples of the eleven basic shades. I used Daniel Flück’s Color Name and Hue JavaScript file as starting point for categorizing the shades. While testing it out, I quickly realized it was not categorizing shades as I would have expected. There were very few browns, as they were often noted to be reds, and there were few greys, as they were noted to be greens or blues. To improve this categorization, I would generate a palette and check to see if the shades produced matched what I would have expected. If they did not, my first step would be to check the name of the color they were most closely matched with to see what shade that color had been noted as. If that matched what I expected, then I would make a new example with the generated color. If the existing example did not match my expectation, I would change the shade that it had been assigned.

Additionally, Flück’s list did not include the shade pink, which is classified as one of the basic eleven colors that English speakers recognize and thus have associations to. I added Pink to the list of shades and then went through the existing Red samples, checking whether that Red was actually Red or if it could be classified as Pink. When generating palettes in testing, I noticed some Pinks were being classified as Violets, so I then went through and changed those Violets to Pinks.

Throughout this process, I was only thinking about how difficult this classification was. I would run into instances when I did not know whether I would personally note a color as an orange or a brown, a yellow or a white, a grey or a green. Often, the case could depend on the other colors in the palette generated and how the classification of the one off-color could lead to more cohesiveness.

In terms of naming the palette, I started by compiling a list of attributes culturally tied to each of the eleven core colors. These came from a range of websites that listed these ideas tied to the colors and was filtered through my own biases as an American living in Ireland. I also included adjectives for pastel colors to include in the case that there are multiple pastel colors in the generated palette.

Given this basic JSON of color attributes, I hesitated on how to begin implementing the naming. Since the generator I had built was in React/JavaScript, I used a Tracery npm package to flatten the colors JSON and make the values accessible from the App. I knew that I wouldn’t have a simple #origin# since I needed the palette names to be conditionally rendered based on the colors in the palette. Thus, I started out by using a simple while loop to produce a list of the most common shades in the palette and then use the first two to produce a name. At the same time, I created a conditional for monochrome palettes that I would later go on to implement.

Once I figured out I could concatenate the names of the shades with the rest of the Tracery String, and that I didn’t need to build many switch/case statements to handle the conditionals, the implementation became much easier. In place of an #origin#, I produced a list of Strings containing the Tracery requests. I then randomly selected the String to be set, in the same way that Tracery functions with its #origin#.

**4. Data, Information, Knowledge**

A creative system – especially a generative one – relies on high-quality data that captures the essence of the domain in which the work is situated. Where does your data come from? Did you craft it by hand, or harvest it from the web, or find it in an online repository? What is the scale and the format of the data? What assumptions are you making about its use and its generality? If you are reusing data that you acquired elsewhere, are you using it in the way it was intended, or are you repurposing it in some novel fashion? If you are using a mashup of data sources, describe them all here and outline the ways in which they are combined.

What is the generative reach of your system? Based on the number and the size of your data sources, and the ways in which you combine them, provide an estimate of the number of unique artifacts you expect your system to generate. In what ways are these artifacts unique, or merely different in composition? This is largely a matter of user perception, so consider that here too. For instance, a trivial system that generates 9-digit telephone numbers has a generative reach of one billion numbers, but they all look much the same to a human audience. Can you distinguish between raw generative power and how it seen by the audience? Your answer to this question will lead us nicely onto the topic of divergence.

**5. Diversity and Divergence**

Psychologist J.P. Guilford proposed a concept of ‘divergent’ thinking, for which he saw having four key traits: fluency as the ability to produce a great number of ideas or problem solutions, flexibility as the ability to simultaneously propose a variety of approached to a specific problem, originality as the ability to produce new original ideas, and elaborations as the ability to systematize and organize the details of an idea as well as carry it out (Guides).

In terms of the system I have created, I would hold that it does have fluency due to the vast number of palette name possibilities. It lacks flexibility in that there are constraints on naming color palettes and thus there are only so many approaches taken.

This project has an element of elaboration from taking the generated hex code, finding the closest matching shade, and then using that shade in its naming. In that sense, it organizes the details of what has been produced to then use those details in the solution.

Originality is the hard concept to pinpoint since defining what is original is difficult. Since these names produced are intended to evoke a feeling of familiarity without being obvious, ideally the names produced would be original. However, since the English language has so few concepts that we very strongly associate with colors, producing new ideas is hard. In some cases, yes, the system does have some original names but in many, there are names that are already likely tied to other color palettes out in existence.

Thus, even if these names are not entirely original, they have a strong meaning that correlates with their usefulness. If the names were entirely out of left field, then they would lack the usefulness that comes from that familiarity, even if some of the names produced are more obvious and less original than intended.

**6. “Mere” Generation and “True” Creativity**

*Mere* generation – the production of outputs just because they meet certain pre-specified rules or fill certain pre-specified templates or obey hard scripts – is less than creative in almost every case, yet very few systems can be said to be free of this aspect of generation. Does your system ever surprise you? Does it ever seem to transcend its own built-in rules or templates? Does it generate everything that meets its rules, or do the rules just propose structurally-valid candidates that are subsequently evaluated, critiqued and potentially filtered in a later stage? In this section you should explore the extent to which your system is merely generative, and to the extent it is not (or strives to be otherwise). Allude to how we humans undertake the same task, or to philosophical considerations if they are relevant.

This system is much closer to mere generation than it is to true creativity as there are no instances when it transcends its own built-in rules. Much of this was due to a time constraint as I had intended to implement a layer of evaluation/filtering on the first generated name but ran out of time.

It’s important to note that average humans would also generate names for these palettes in a similar way. Without background cognitive knowledge of color associations, most humans would simply take a couple basic words they associate with the boldest colors present in the palette to name the palette. After a while, they would start repeating those basic words because there are only so few words they strongly associate with the colors. They would have a stronger ability in naming two or three bold colors in the palette that have ideas tied to the combination of those colors. For example, ying-yang for black and white or Christmas for red and green. But in the end, there seem to be bounds on what we would reasonably name the color palettes while those names remained relevant to the context.

**7. Evaluation, Self-Critique and Filtering**

A creative system is more than a generator of outputs. Creativity also requires a degree of appreciation, of what is being produced and of how it will be viewed by an audience. A system without an evaluation stage cannot claim to be creative in any sense. Nonetheless, this stage need not be a distinct phase or module in the production pipeline, but might be incorporated directly into the generator itself. Naturally, this possibility only serves to complicate the already nuanced debate about mere generation. In this section you will describe the mechanisms that you have built into your system to evaluate its candidates, as well as any filtering or threshold criteria that are employed to limit what is actually shown to the user. What proportion of candidates are filtered in this way, on average, and just how effective (in your opinion) is this mechanism at raising the standard of output?

Is your evaluation metric based on established criteria for human creativity, such as novelty, originality, surprise, usefulness, and so on? If so, define what you mean by those terms, and justify your formalization of them in your system. To what extent is your system P-Creative and H-Creative (to use Boden’s terms)? At this point, you should also be explicit about what you mean by “creativity” in the context of your system and its outputs.

There is no internal evaluation process built into this system since I ran out of time to implement one.

This project is somewhat P-Creative in the fact that there are a finite number of color palette names that could be produced from the words available and number of possible structures. However, that number is so great that to the naked eye, it would seem that a palette name would never be repeated. Thus, each name seems to be novel and therefore the system has the sense of being P-Creative.

In terms of being H-Creative, it seems unlikely that there has never been the same name used for a color palette. However, it can most definitely be said that the name produced has never been tied to that exact palette and will most likely never be again.

**8. Hits and Misses**

One hit that I am proud of is the implementation of the pastel naming. I had to research how to tell whether a produced HEX code could be considered pastel and then determine how often I wanted to deem a palette “pastel enough” to warrant the use of a pastel adjective in its name.

Another hit is the use of a specific color name along with the max element. This not only adds many more options for the origin but also incorporates more specificity into the name so it’s more strongly tied to the palette.

One miss is the lack of two-color associations. The idea I wanted to implement after the evaluation step was to produce lists of words that are tied to two shades, such as soccer ball for white and black or watermelon for pink and green.

Another miss is the sometimes wanky sentence structures as the words in the Noun lists, Things lists, and Places lists are not so similar as to be referenced exactly the same.

**9. Conclusions**

While this project is not all that I wanted to produce, I will say that I am proud of what I did create. You can see my own interests shine through my project, in the fact that I created a GUI and had a heavy hand in the associations with the colors. I honestly struggled in the beginning to have a clear vision for how to produce this system and often veered off course before coming to this final version.

**Acknowledgements**

Thank you to Daniel Flück for his Color Name and Hue tool, as well as his rapid responses to my emails. All the work in this project was done solely by me and none of the core code was obtained from any other projects or people.

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List any bibliographical citations here for people and work that you quote/cite in the main body of your report. Use the general format below for all bibliographic entries. Ensure each entry is complete (including author, year, title, publication). Be sparing in your citation of URLs and Wikipedia pages. Do not cite bare URLs unless absolutely necessary – cite instead the print publication if possible.

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