

KaggleX Cohort 3 Project Showcase

Background

- I'm a software developer and team lead working with web/mobile technologies like Angular and Java;
- I have a BS. and MSc. in Computer Science from Brasília University;
- I've been working on NLP, LLM and Information Retrieval on side-projects;
- I love to code, build and break stuffs to the sake of learning new things.
- I aspire to work as a data scientist, use AI to solve interesting problems and build products;









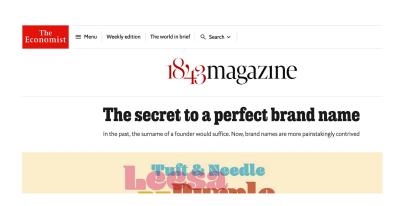
Name My Lipstick A LLM Streamlit RAG like App Thiago Vieira

Motivation



Motivation

- My wife interests about beauty cosmetic products
- Got me wondering was how beauty brands come up with those captivating and stylish names for their lipstick shades: Ruby Woo, Viva Glam, Kinda Sex, All Fired Up...
- Curious about the creativity process and allure of lipstick names, particularly those from iconic brands.
- And it's sound like a fun problem to tackle







Problem



Problem Definition

What if you could harness the power of Generative Al to create lipstick names that align with a famous brand style given a color value?



Dataset



Dataset



2018 MAC Shade List from here

0 (173, 94, 89) Twig, Sunset Rose Twig Sunset Rose 1 (236, 94, 58) Neon Orange Neon Orange 2 (210, 87, 141) Breathing Fire Breathing Fire 3 (130, 26, 27) Love Weapon (Ltd. Ed.) Love Weapon (Ltd. Ed.) 4 (176, 98, 96) Cosmo Cosmo 5 (228, 88, 53) Morange Morange 6 (118, 199, 242) nan amnol 7 (183, 70, 116) New York Apple New York Apple 8 (72, 28, 25) BCrowned (Ltd. Ed.) Crowned (Ltd Ed) 9 (185, 80, 76) Runway Hit Runway Hit 10 (213, 89, 65) Flamingo Flamingo 11 (52, 97, 180) Designer Blue Designer Blue 12 (194, 60, 110) Lickable Lickable 13 (176, 107, 91) Quartzette Quaitzette 14 (203, 83, 67) Pretty Boy Pretty Boy 15 (39, 29, 102) IMatte Royal Matte Royal				
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	Lady Danger	Lady Danger	(197, 58, 53)	30

tessract_text



easyocr_text

Preprocessing

- split images in chunks based on the number of rows and columns;
- extract the color from the upper right pixel with padding of each chunk;
- ran OCR with Pytessract and EasyOCR to extract the names;
- simple EDA;
- clean data.

```
data = []
for row in range(rows):
   for col in range(cols):
        left, top = col * piece width, row * piece height
        right, bottom = (col + 1) * piece_width, (row + 1) * piece_height
        piece = im.crop((left, top, right, bottom))
       piece_path = output_folder / f"piece_{row}_{col}.jpg"
       piece.save(piece_path)
       print(f"{Fore.GREEN}[INFO]{Style.RESET_ALL} Saved {piece_path}")
       # Extract the color of the central pixel
        color pixel = extract color upper right(piece)
        print(f"{Fore.GREEN}[INFO]{Style.RESET_ALL} Upper Right pixel color: {color_pixel}")
       # Check if the color is kind of white
       if is_color_kind_of_white(color_pixel):
           os.remove(piece_path)
           continue
        # Extract the text shown in the piece
        tessract_text, easyocr_text = extract_text (piece, piece_path)
       print(f"{Fore.GREEN}[INFO]{Style.RESET_ALL} Extracted text with tesseract: {tessract text}")
       print(f"{Fore.GREEN}[INFO]{Style.RESET_ALL} Extracted text with easyocr: {easyocr_text}")
        # Store the color and text in a dictionary
        data.append({'color': color_pixel, 'tessract_text': tessract_text, 'easyocr_text': easyocr_text})
# Pass the list of dictionaries to the save_to_csv function
save to csv(data)
```

main loop



Similar Color Search

 <u>CIELAB color space</u> - approximates very closely the way humans perceive colors <u>source</u>

```
1 def hex2rgb(hex):
2    hex = hex.lstrip('#')
3    return tuple(int(hex[i:i+2], 16) for i in (0, 2, 4))
4
5
6 def rgb2hex(rgb):
7    return '#%02x%02x%02x' % rgb
8
9
10 def rgb2lab(rgb):
11    return cs.cspace_convert(rgb, "sRGB255", "CIELab")
```

```
1 def topk_similar_colors(target_color, original_colors, k=5):
     target_lab_color = rgb2lab(target_color)
     original lab colors = []
     for color in original colors:
         lab color = rgb2lab(color)
         original_lab_colors.append(lab_color)
     original lab colors = np.array(original lab colors)
     color_differences = np.linalg.norm(original_lab_colors -
  target_lab_color, axis=1)
     # Get the indices of the closest colors
     closest_indices = np.argsort(color_differences)[:k]
     similar colors = {i: original colors[i] for i in closest indices}
     return similar_colors
```



Prompts



Prompts

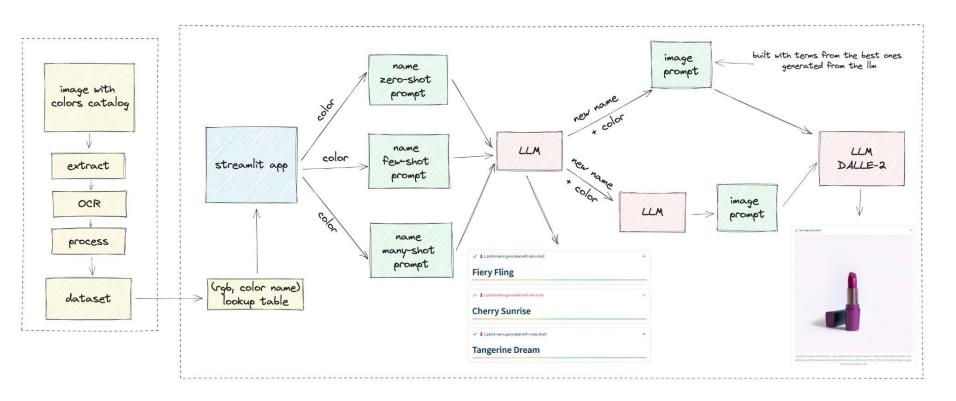
```
1 ZERO SHOT PROMPT TEMPLATE = """
2 As a head of MAC cosmetic advertisement department and marketing expert,
 3 I want to create a lipstick name that is based on the following RGB tuple color delimited by triple
   quotes
 4 \"\"\"{color}\"\"\"
 5 and follows the MAC cosmetics name style for lipstick and is easy to remember.
 6 Give your answer with only the generated lipstick name without any punctuation.
9 FEW_SHOT_PROMPT_TEMPLATE = """
10 As a head of MAC cosmetic advertisement department and marketing expert,
11 Create only one lipstick name that is based on the pairs of RGB tuples color and lipstick name
   delimited by
12 <hex> and <name> tags below:
14 {examples}
15 <rgb>{color}<rgb>,
17 do not repeat any name from the examples
18 output only the new name between the <name> tag without the tag or any punctuation
```



Solution Overview



Name My Lipstick Architecture





Tools













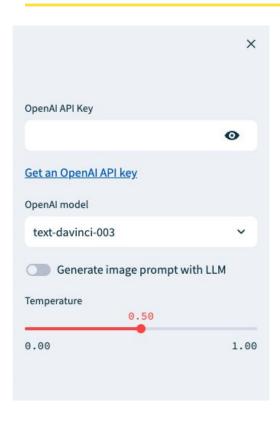


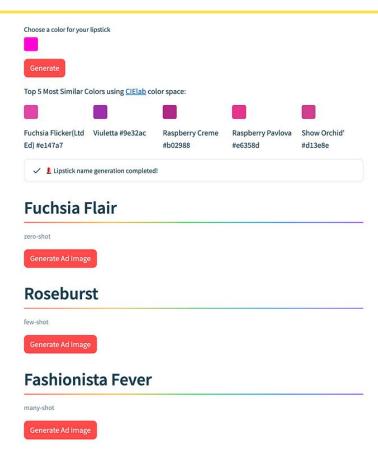






App









Examples



Some Good Examples







Fiery Red Electric Violet Cherry Bomb



Evaluation



Evaluation

- GPT-4 generate more appealing and creative names;
- text-davinci-003 (instructGPT) model has a good balance between cost and quality;
- name few-shot prompt gives better names on average;
- fixed image prompt produced more consistent images based on the desired behavior;
- spent ~\$30 on OpenAl API calls.

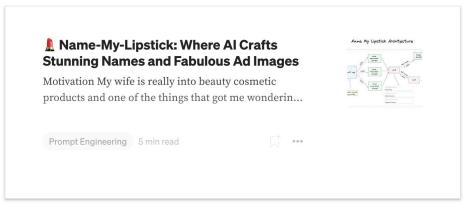


Wrap Up

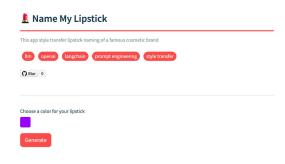


Wrap Up

- collected data and preprocessing it;
- text and image LLM integration via API using LangChain;
- similar color search space using CIELab for RAG like lookup table;
- streamlit app built and deployed to Streamlit Cloud https://namemylipstick.streamlit.app/
- post on Medium Name-My-Lipstick: Where AI Crafts Stunning Names and Fabulous Ad Images
- GitHub repository https://github.com/tcvieira/name-my-lipstick









Improvements



Improvements

- Allow user to custom image prompt at runtime;
- Do the reverse. Given a lipstick name generate the color;
- Use DALLE-3 API (not available yet) or other image GenAI to provide lettering and writing on the generated images;
- Add support to run on a local LLM;
- Add feedback feature for later RLHF pipeline implementation;
- Collect more data from other brands.



Acknowledgment



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