



GTU CSE 495 GRADUATION PROJECT

SECONDARY PRESENTATION

IMAGE RECOMMENDER

ÇAĞRI ÇAYCI

ADVISOR: Dr. GÖKHAN KAYA

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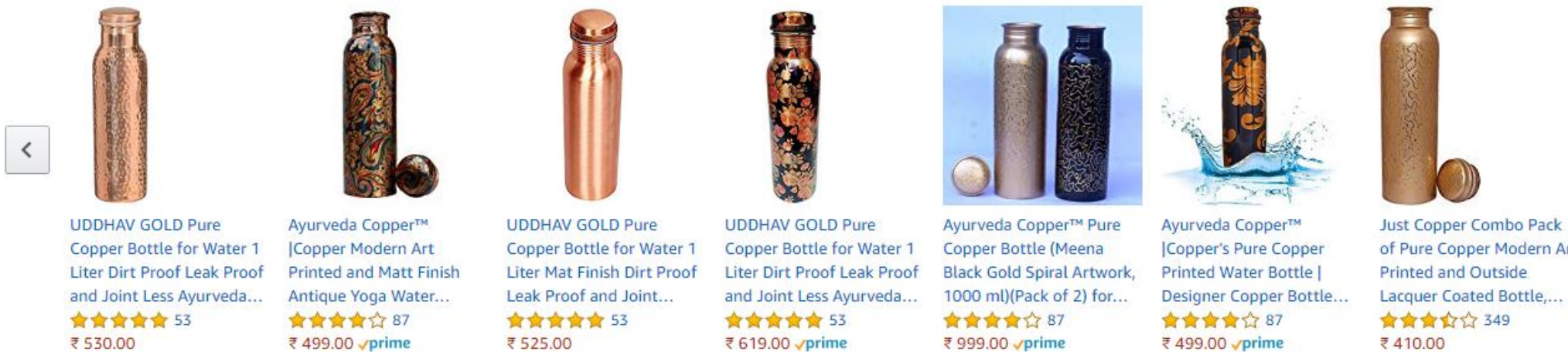


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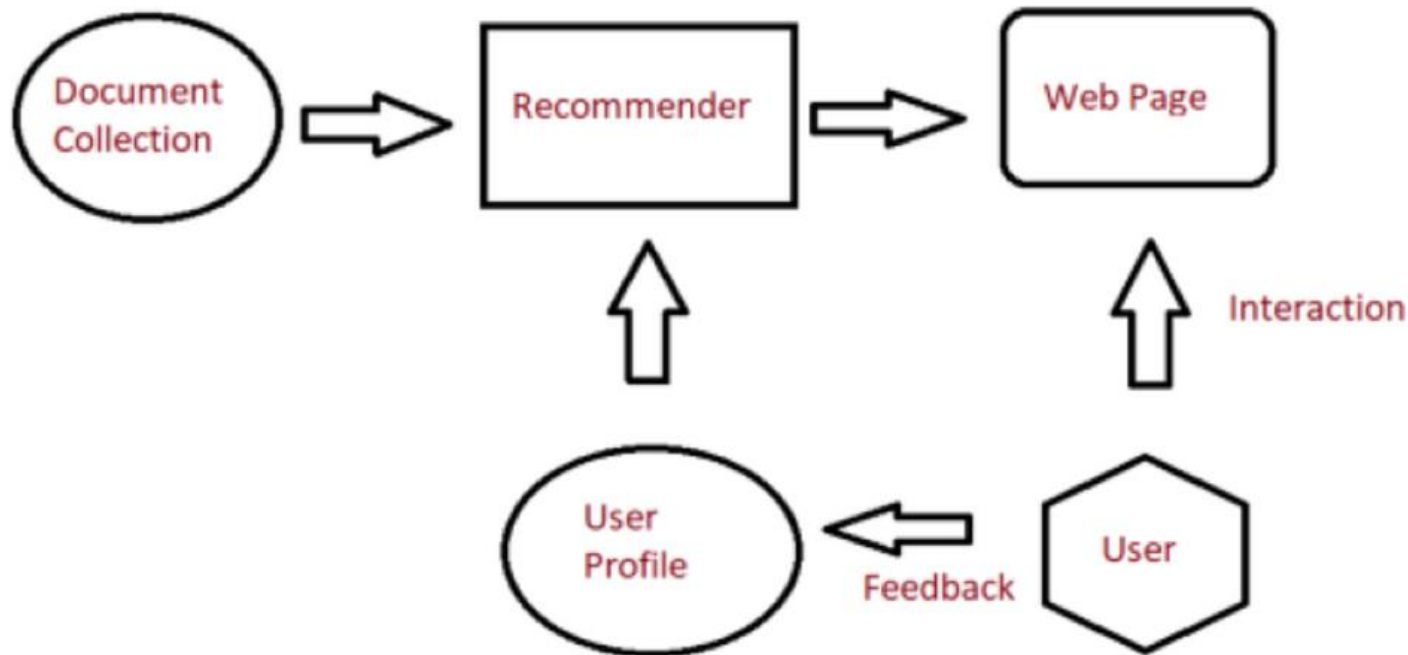
Sources

An image recommendation system is a technology that suggests images to users based on their preferences and past interactions. It uses algorithms and machine learning to provide personalized image suggestions, often seen in online shopping and social media platforms.



Introduction

There are different kinds of image recommendation techniques. Some of them are content-based, probability-based, and **tag-based** recommendation. In this project, **tag-based** recommendation technique will be used.



In designing this image recommender system, two assumptions are made:

- **User Preference for Similar Images:** Users are more likely to enjoy and engage with images that share visual similarities.
- **Semantic Similarity through Labeling:** Images with similar labels convey semantic similarities, aligning with user expectations.

These assumptions guide our system's design, emphasizing personalized recommendations and enhanced relevance. As we progress, we will explore how these assumptions contribute to the user experience and overall system performance.

Design Plan

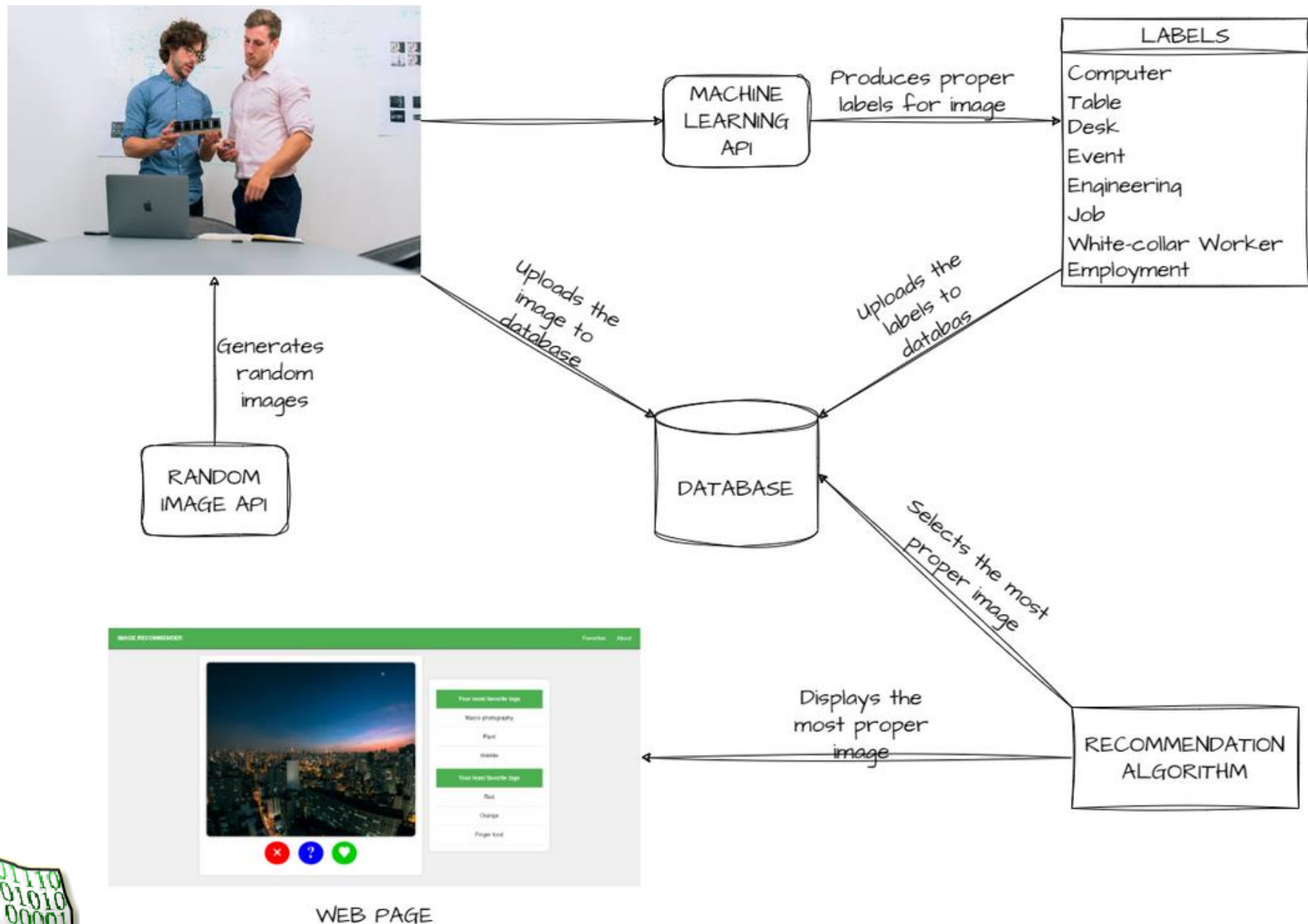
Labeling images goes beyond recognizing objects; it involves understanding complex ideas within visual content. To make this task easier, we use the Google Vision API.



Outerwear	95%
Podium	95%
Flag	92%
Public Address System	91%
Microphone	91%
Lectern	84%
Audio Equipment	80%
Spokesperson	80%
Chair	79%
T-shirt	79%
Curtain	77%
Event	75%
Stage Equipment	74%
Public Speaking	73%
Suit	72%

As depicted in the image, certain labels like "Spokesperson" or "Public Speaking" are inherently context-related. Acknowledging the dynamic nature of these labels adds a layer of sophistication to system.

Design Plan



- Random Image API generates random images.
- Machine Learning API produces labels for image.
- Both image and labels uploads to the database.
- Recommendation Algorithm selects an image from database.
- Web Page displays the image.



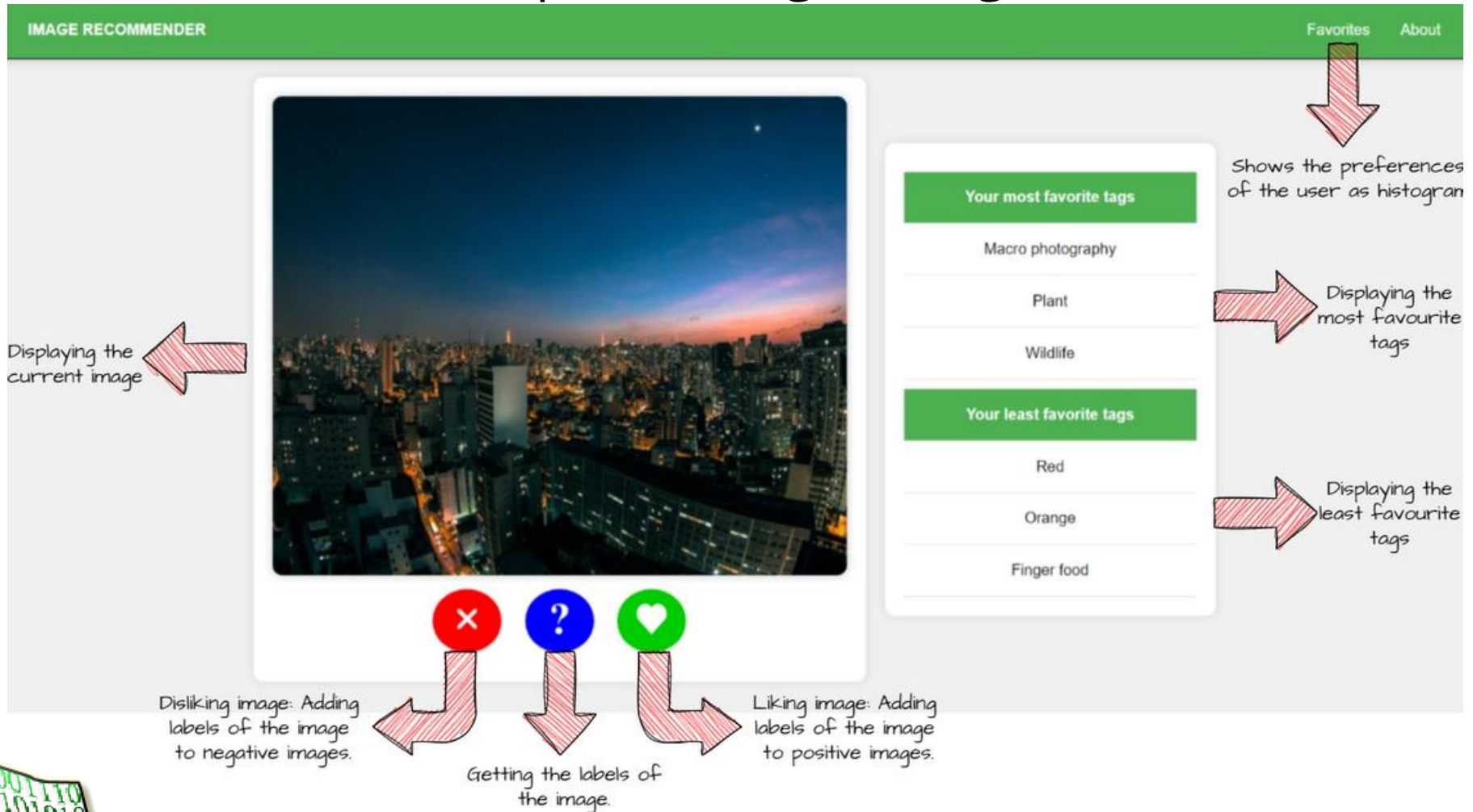
What things has been done so far;

- I've identified suitable APIs for image labeling (Google Cloud Vision) and image creation (API Ninjas).
- I've successfully coded the integration to add labeled images to my database.
- I've populated my database with a variety of images using this code.
- I've developed the front-end part of the my website.



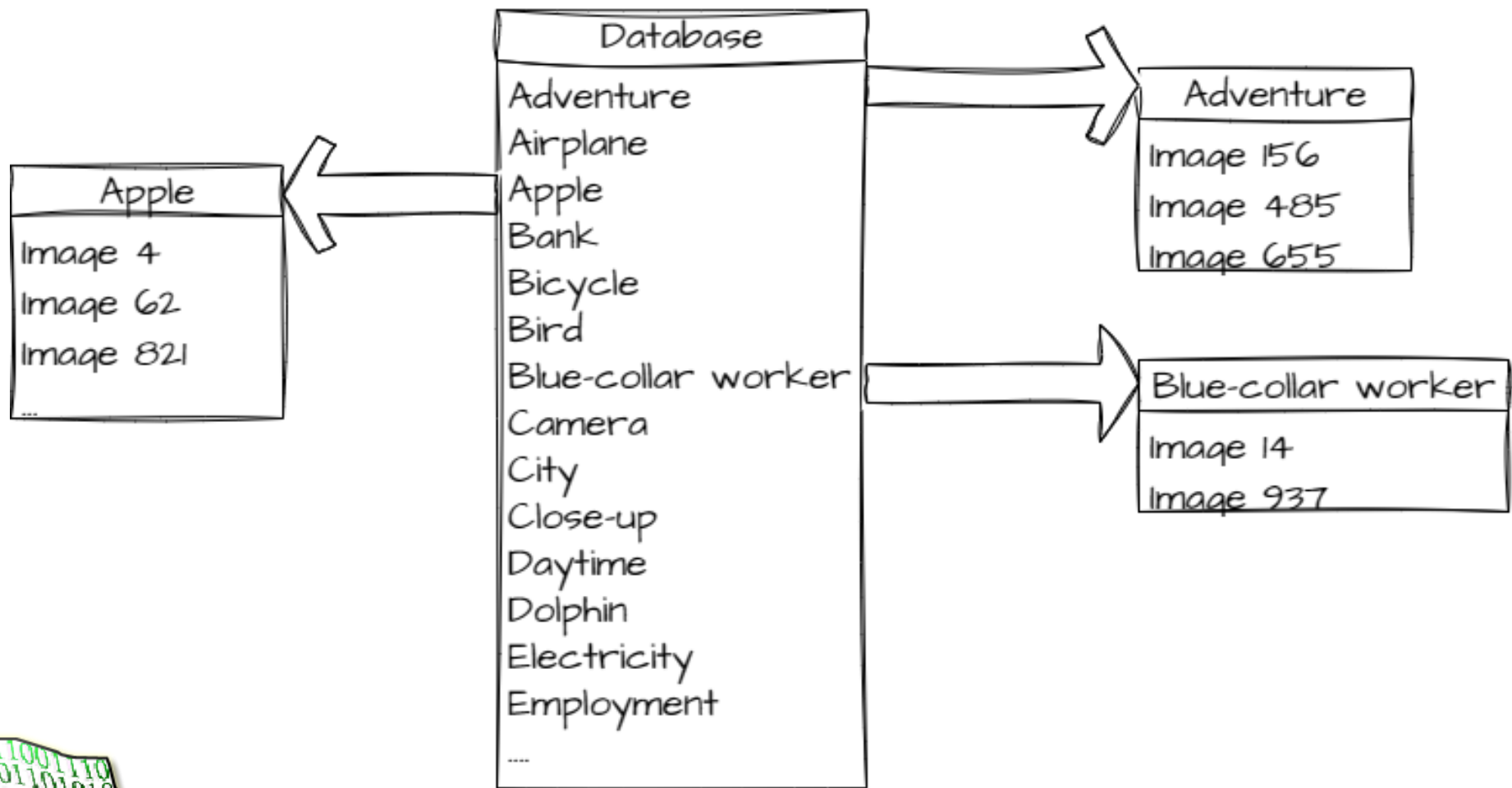
Completed Tasks

The web page is done with all the buttons and features, but it is still needed to make it pick the right images from the database.



Completed Tasks

The database is structured as a collection of labels, where each label entry contains the associated images that match with it.



What things are planned to do;

- The number of images in the database must be increased.
- An algorithm must be developed to recommend image based on users preferences.
- The recommendation algorithm must be implepemented for web page.
- The project success must be measured by testing it with objective users.



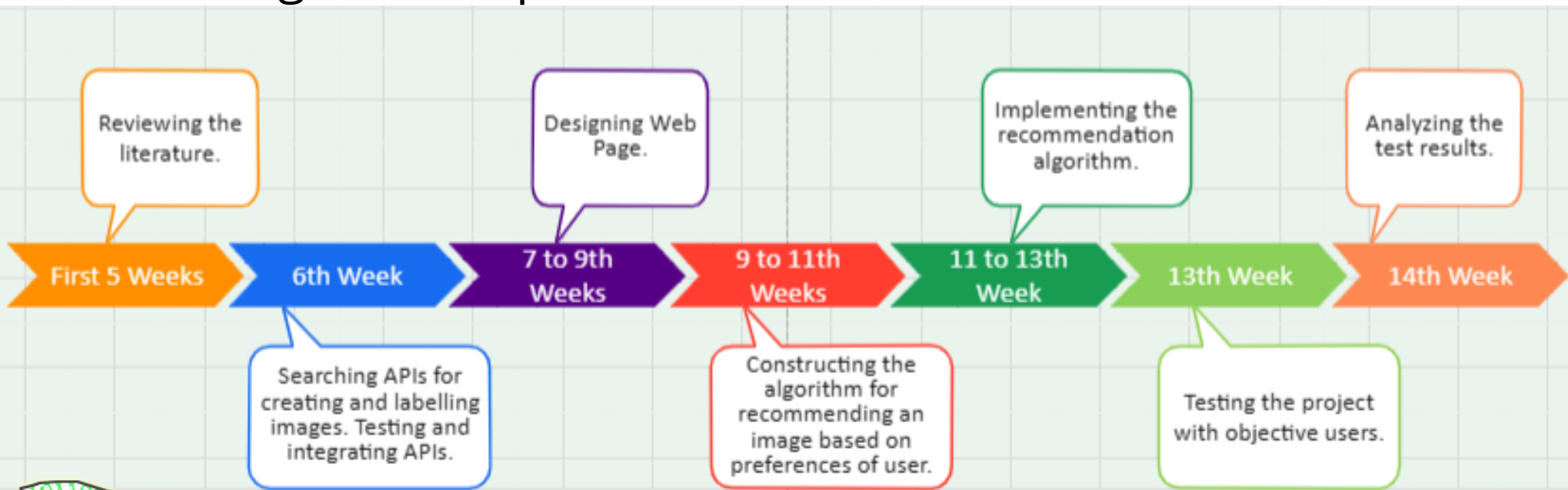
Challenges and Reconsiderations

- Naive Bayes Classification is intended to be used in this project. However, it was not used due to advisor's feedbacks and efficiency issues.
- Developing mobile application was considered, but since web applications are more accessible, it was decided to develop a web application.
- Structure of database is changed according to advisor's feedback. All the images are reuploaded to database.



Project Timeline

- The project has reached its current stage exactly as planned on the timeline.
- The recommendation algorithm is being developed currently.
- Documentation will be carried out in the 2-week period following the completion of the 14th week.



To complete this project, some of the requirements are;

- **ML model** must tag the images.
- A **recommendation algorithm** must be implemented to generate recommendations based on previous interactions of user with images.
- User interactions must be saved.
- A **user interface** must be created.
- Liking rate of user for the images should be measured.



To satisfy the requirements, the following steps will be applied;

- **Python** will be used only for integration of Machine Learning Model and Random Image Generator.
- **JavaScript** and **HTML** will be used for GUI.
- **Google Cloud Vision** library will be used to tag images.
- **API Ninjas-Random Image API** will be used to produce random images.
- **Firebase** will be used to store images and user profiles.
- A large **dataset of images** must be produced by Random Image Generator.



Success criteria for the image recommendation system are;

- The system must recommend **different** images from the previous images.
- Like rate must be higher than **50%**.
- Most of the recommendation image must contain the favourite label of the user.



- <https://www.linkedin.com/pulse/recommender-systems-quickest-way-boost-your-online-sales-karabogali> [Online Shopping Image]
- <https://www.drawio.com> [Drawing Design Plan and Database Content]
- <https://cloud.google.com/vision?hl=tr> [Labelling Images]
- <https://www.edrawmax.com/online> [Creating Timeline]
- <https://www.geeksforgeeks.org/ml-content-based-recommender-system> [Recommendation System Visualization]



THANK YOU FOR LISTENING

