Project Outline

**There will be two APIs used in my final project:**

1. NASA open APIs
   * This API provides beautiful imagery of astronomical objects. Every object has amazing stories behind it. Some objects also have YouTube video links provided.
   * NASA open APIs also allow applications to query for APOD( [Astronomy Picture of the Day](http://apod.nasa.gov/apod/astropix.html)), which is interesting.
2. Google drive API
   * Google drive API is a well-known API for user cloud storage.

**The authentication process:**

1. NASA open APIs
   * The authentication process for NASA open APIs is simple. Application owner first applies an apikey on NASA website, and then every time the application queries from NASA open APIs, it appends this apikey to the end of query string.
   * The apikey will not expire or change unless application owner changes it.
2. Google drive API
   * The authentication process for Google drive API involves more steps than NASA open APIs
     1. Application owner registers a client ID and client secret from Google API website
     2. When clients visit the site, the application asks Google drive API for protected access to clients’ account. Clients then will be directed to a page that ask them to authorize this application to request some of their protected data.
     3. If clients approve it, then an access token will be granted to the application.
     4. The application will append the access token for every request on clients’ data.

**Use cases of the project:**

Clients will see a page that ask for Google drive account authentication before They can use the following functionalities.

1. Picture of the day

* There will be a clickable link called “The picture of the day”. If clients click that button, the program will query APOD from NASA open APIs and get the content. Then the program will add the content to a doc file and save the doc file into clients google drive account.
* The content will also be displayed on page

1. Random Astronomical object story
   * There will be a clickable link called “random story”. If clients click this button content about random astronomical object will be save into clients google drive account.
   * The content will also be displayed on page
2. Search
   * Clients will be able to search interesting topics in astronomy and pick any content to be save to their google drive account.
   * The content will also be displayed on page

**Areas of optimization:**

1. Cache

* We can cache images related to certain astronomical objects
* We can cache the content of the search result of clients
* We can cache “the picture of the day” from NASA APIs and update it every day

1. Avoid duplicate
   * We don’t save same contents twice to clients google drive account

**Authentication Sequence Diagram:**

A close up of text on a whiteboard

Description automatically generated