Assignment

Problem Statement - Building a text based search engine

A. Write a program for
   a. Given a set of **N words/phrases**, download the text (not html) of corresponding wikipedia articles
   b. Write a **search engine** which will take as input a word (any word!), an algo (**Algo 1: TF-IDF, Algo 2: Word2Vec**) and outputs the following
      i. Articles which are closest to the given word (ranked from 1 to N)
      ii. Closest possible search terms from your **index**
      iii. How many articles appear in the same group with both the algorithms with the given search term
         1. Same group means 1-10, 11-20, and so on…
      iv. Time taken to make the search
      v. The user must be able to select an article, and then the following should be shown
         1. Link of the wikipedia article
         2. Its rank using both TF-IDF and Word2Vec
         3. Closest search terms to the input word using the selected algo

Problem Statement - Building an image based search engine

B. Using the same N words, write a program to

1. Download top 50 images from Image search engine of your choice (Google Images, Unsplash etc.)
2. Resize them to max (1000, 1000) pixels maintaining the aspect ratio. Don't resize smaller images
3. Based on an input image (can be "any image") and a value of "k", do the following
    a. Use SIFT and Bag of Visual Words to build an index to perform the search (use k words = 5, 10, 50, 100, 500).
    b. Show the images which are closest visually to the input image and also show the tag (i.e. the word you used to download it). Rank all images
    c. Also show the statistics
        i. time taken to retrieve them
        ii. How many images from the same search word are in top-50 results

Problem Statement - Building a multimodal search engine

C. Build a multi modal search engine using the previous two search engines

1. Given a word or image as input, show the closest words and images
    a. Ex: (IIT Delhi ~ IIT Madras), (King, Queen)
    b. Show all the statistics developed before
    c. You can learn new embeddings on top of the existing embeddings used to solve A, B
    d. You are free to build your own technique, utilize existing research

Also think how you can integrate audio, video to such a search engine (include in report)
BONUS: Solving it will hold credit towards written exam

Problem Statement - Building a multimodal search engine

- Groups of up to 5 students
- You are free to use any library
- You will be provided with N = 100 words for your assignment
- Evaluation will be based on
  - You need to submit a code (well documented), and a video of the working code
  - You need to submit a text file which will be based on following
    - Outputs (in a predefined format) for random 20 words from the provided words
    - A test set of 30 new words, on which the output will be computed using the code provided by you (live demonstration/evaluation server) for each of the three tasks
    - The time and quality of results will be used in marking
    - If you have a great UI and show great design and development acumen, it will be definitely taken into account.
    - Advanced statistical analysis to explain the results on the fly will be an extreme advantage
  - A DETAILED REPORT (IEEE Conference Format) detailing the experiments, hardware used, methodology, results, analysis etc.
- You can discuss with your peers, take help from code available over the internet, BUT ENSURE THAT YOU ACKNOWLEDGE everything you use (no acknowledgement will be a big red flag)
- Weightage:
  - A: 20%, B: 20%, C: 50%, Quality of work, presentation, report: 10%

Drop me an email if you have questions: siddharth.sri89@gmail.com

I will put more details on https://siddharthsrivastava.github.io