Internship Challenge

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Notes:

1. You don’t have to complete all of them, do the one you are interested in. Preference will be given to candidates who will solve multiple challenges.
2. If you are using compiled language then make sure your program is getting compiled in linux. Include compilation instructions in README file.
3. Do not hardcode paths, take them as input from command line
4. Write well documented code. Use comments for explaining code.
5. Create README file to explain how to compile the code and how to run the program.

Time Duration: 8 hours.

Permutations

Goal: Create permutations of strings from a dynamic array of array, taking a single element from each array.
Input: A CSV file, which can be loaded into an array of array.
Expected output: Comma separated strings of all permutations
Language: Any

Input CSV file:

Content of input.csv

```
‘a’, ‘b’, ‘c’
‘i’, ‘j’
‘x’, ‘y’
```

Output strings:

```
aix, aiy, ajx, ajy, bix, biy, bjx, bjy, cix, ciy, cjx, cjy
```

Expected CLI Input

```
./executable input.csv
```

Character Tree serialization

Goal: Write a program to create a custom tree data structure using linked list (tree of characters), serialize it and store it in a file and deserialize it and load it back to data structure. The program can accept two command line arguments a) create b) load

a) “create” argument should read words from the csv file, create tree of characters and then serialize it and save it to the file-path accepted after csv file name
    i) Example: `./executable create csv-file.csv serialized-output.bin`
b) “load” argument should read the serialized file, recreate the character tree and print all the words present in the tree.
    i) Example: `./executable load serialized-output.bin`

Language: C / C++ / Java

Example Input

Content of csv-file.csv

```
Hello
World
Foo
Bar
```

Note:

1. Do not use build in data structure for tree.

Word Suggestion

Goal: Given a list of words (say dictionary) in a csv file along with its frequency. Take a word as input and suggest five closest words from dictionary sorted in order of relevance.
Assume that user is trying to type a dictionary word which they misspelled, and you have to suggest the correct word.
Language: Any

Example Input file:

Content of dictionary.csv

```
Hello, 300
World, 50
Hi, 600
How, 500
Are, 900
You, 200
```

Expected CLI Input:

```
> ./executable dictionary.csv hellp
Hello, word2, word3, word4, word5
```

Reverse Engineering

This challenge will judge your reverse engineering (or you may say, hacking) skills.

This is an APK of Marathi Keyboard. It has English => Marathi transliteration feature. It uses a map of english to marathi words to achieve that. Extract (and decode) the mapping file and convert it to human readable csv format.

Artificial Intelligence

Problem1 - Face Mask Task :

For this problem, you'll need to set up your own collab and submit your solutions as a link. The overall statement along with a workable gist [without solution] can be found ~~here.~~here. Feel free to copy code from this gist.

Please follow the below steps:

- Download a small set of image data from here.
- Upload the contents of the folder downloaded above as "faces" instead of "FaceMaskData…" to your collab Runtime. This ensures some loading and preprocessing steps work without issues.