Wizard of System Programming

File Tagging

Create a software that will help users organize their **Files** on disk using **Tags**.

- A tag is an arbitrary value that can be associated with a file. (Like names of people, places, events, etc.)
- Users should be able to tag their files and locate them using tags.
- A file can be associated with multiple tags, and a tag can be associated with multiple files.
- You can relate it to something like how an email-client help organize emails using labels.

Essential features which are expected

Tagging files
First, user will need to tag their files.

- Can you produce a simple and intuitive experience to allow users to tag files?
- *Really think* about where and how you are going to store **File ↔ Tag** relationships.

Locating files

Okay, we have some files on disk which are tagged by user. Now user wants to locate these files using tags.

- You need to take some input from user (example, name of tag).
- Using that input, locate all resulting tagged files and display them to the user.

What will make your software a winning candidate?

Under the domain of System Programming, we are looking for Wizards who can create magically fast software! Focus will be more on performance, efficiency, and technical design choices rather than user interface.

Performance
- How long does it take to locate all files for given input? (Especially when several files are tagged)
- How soon can user start to see search results?

Design choices
- What if I move my files around, will they remain tagged?
- What if I rename my files, will they remain tagged?
- What if I change content of my files, will they remain tagged?
- What if my files are in an external drive and I plug it in a different computer, will they remain tagged?

Robustness
- What kind of edge cases and exceptions have you handled?
- How well can your software handle erroneous input?

Native implementation

- While choice of technology is yours, implementing this software using native system calls will carry a greater precedence!

What more can you do?

Feel free to think out of the box and add features that you would like to have which you think will help users organize and locate their files efficiently. They may earn some additional brownie points! Here are a few ideas -

Powerful queries

- Can I use logical expressions with tags to locate files? Example -
  - o (Physics OR Maths) AND Assignments
  - o Vacation AND (Family OR Friends) AND NOT Goa
- Can I automatically tag file's meta data (file name, type, date, etc.) and use them in search? Example –
  - o 2022 January Vacation Pictures
  - o Music AND (Classical OR Old) AND (Hindi OR English)

Ease of use

- Can I tag / un-tag directly from my native file explorer? (Right click context menu)
- Can I tag / un-tag multiple files spread across file system in one shot?
- Can I interact with search results? Example, open located files with default program.