Stable Storage and File System Activity Instructions

(format borrowed from TIDES and FIC workshops:)

As we continue to build our knowledge of the system, let's think through what we already know—and make logical guesses for the knowledge we do not yet have.

1. Draw an array representing 16 blocks in a single partition on disk. This is your TinyFS.

2. Where is swap on your disk? Indicate that.

3. Consider a running process, Process A, that is executing a file editor. The user is lucky, as the system is under low memory pressure, and all pages of the process are currently resident in memory. The user is tired of editing their file for the moment, and they click the "save" icon in the upper left hand corner. They vaguely wonder why the save icon is shaped that way.



    a. Why is the save icon as it is?
    b. Clicking that icon is an external event, and the system must react.
        i. What device likely caused the click?
        ii. How will that communication occur?
        iii. What mode was the process likely in before the click? What about after? Explain.

4. Process A now needs to save the file, which it will do using the write() system call.
    a. What mode is the process in before calling write()? What about after? Explain.
    b. What will write() likely do?

5. As the file system goes to save the file, it will need to update the file metadata and store the file data blocks on the disk.
    a. What file metadata is the system likely to keep for each file?
    b. Indicate where on your disk the metadata is likely to be stored.
    c. Indicate where on your disk the data blocks are likely to be stored. You may assume the file is 14KB.

6. Now consider another process, Process B. Process B creates a file of size 22KB and stores it on disk.
    a. Indicate where on your disk the metadata is likely to be stored.
    b. Indicate where on your disk the data blocks are likely to be stored.

7. The user writing the file in Process A has gotten a second wind and added to their document. They save again, extending the file to be 30KB.
    a. Indicate where on your disk the metadata is likely to be stored.
    b. Indicate where on your disk the data blocks are likely to be stored.
    c. What metadata needs to be updated?