Andrew Meyer

CURS Summer Project Reflection

In working on this project, I learned a lot about the inner workings of file systems. Before, I knew what a file system was, and some very high-level differences between common file system types, such as FAT, NTFS, and ext4. I had to learn the major components and mechanics of FAT and NTFS in order to plan out the file deletion scenarios we would simulate, and I learned various quirks of the systems' respective implementations when figuring out how to actually create those scenarios.

There were several obstacles to overcome for this project. All our test scenarios had to be created through normal file system operations (e.g. copy, move, or delete files), rather than directly manipulating data on the drive. This meant some cases took a bit of experimentation to properly create. For example, in test cases where one file is written over a deleted file's data, I found that the deleted file's directory entry (essentially its entry in the master list of files) would also be overwritten. This meant there was essentially no evidence of the deleted file existing, so the test would be worthless. After some experimentation, I determined the algorithm for the placement of directory entries, and set things up so both the new and deleted files' directory entries would be visible. This is ironically a result of trying to make our test cases as simple as possible, the planned scenario would be far more likely in a file system with many files, but creating it with only two files took some convoluted extra steps. Another issue we ran into was that some of the planned test cases were possible in FAT but impossible in NTFS due to different algorithms in use. There's no point testing scenarios that can't happen in practice, so we just scrapped those cases for NTFS.

There were also scheduling issues, with one group member managing a full-time internship as well as this project, we sometimes had difficulty finding a good time to meet and discuss progress. I also spent the summer at home, so we had to meet over Skype, rather than in person.

Besides those issues and the ones mentioned in Quinton's reflection, the project went very well. I learned a lot, and we finished everything we set out to do.