FAT16 Analysis

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**Problem Description**

The goal of this project is to analyze a drive that uses the FAT16 format and list all files on the drive, even the deleted files. In order to do this, the boot sector of the drive should be analyzed for information on the organization of the drive. This information can then be used to locate information on the files within the drive.

**Problem Approach**

To solve the problem, the approach taken was to first find the set values of the number of bytes per sector, sectors per cluster, total number of sectors, and the number of FATs on the drive and the size of those FATs. These can then be used to determine where the root directory starts by adding one sector to the number of fats times the size of those fats (in sectors) times the number of bytes in a sector. Once the root directory is found, the file information can be read according to how the root directory is organized.

**Telling the Difference Between Deleted and Non-Deleted Files**

To tell the difference between deleted and non-deleted files, I used the first bit in each of the directory entries. The first bit of a regular file was always \x41, so I checked if the entry had that value in the first bit and then carried on gathering the file information. The first bit of a deleted file was always \xe5, so I checked if any of the entries had that value and gathered information on the deleted file.

**Retrieving A Fragmented File**

Fragmented files would be an entry on the root directory of the drive so this program would list them when listing the files on the drive. In order to retrieve the files, you would have to use the FAT to find all of the sectors that pertain to the fragmented file.\

**Corrupted FAT16 Table**

If the FAT16 table were to be corrupted the locations of the files and the sectors that those files occupied on the drive would be lost. It would be possible to step through the drive line by line to determine where the files were stored, but that would be very time consuming. Programs would not be able to read the drive correctly if the boot sector or the FAT table were to contain the wrong information or be missing or be corrupted.