Tom Burns
tjb234
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Project 4 writeup

I worked alone on this project. I was able to complete the project as written in the project description but was unable to test my implementation in any meaningful way. I finished all required methods and method dependencies. When running my code however I kept receiving errors due to what was most likely incorrect implementation. I was pressed for time so I was not able to brute force the debugging of what I had written to get it to work in time for the deadline.

```
// Total Blocks = 8192 (DISK_SIZE / BLOCK_SIZE)
// superblock (0) | inode_bitmap (1) | datablock_bitmap (2) |
// inode block (3-67) (16 inodes per block * 64 blocks = 1024 inodes) |
// datablock (68+)
```

I was able to learn a great deal from this project about the practical application of file systems and how they function when looking at it from the memory perspective. The idea of persistent memory was also important as we assumed that we could not have memory structures that held values throught the runtime of our test, so we had to write to a file to store the structures that were used in this project, including the superblock, inodes, and datablocks. The structure of this storage follows what I describe in the commented code above. The superblock holds information about the memory and filesystem structure and sets most of the framework for the rest of everything. The bitmaps are stored in one block each, since they fit into the size of a block easily. The inode and datablock bitmaps follow. The inode block space is of size 64 since MAX_INUM*INODE_SIZE / BLOCKSIZE = 64.

I implemented all of the listed functions in the project description. I believe that the logic is correct in the initial functions up to and through the directory functions up to get_node_by_path(). I attempted to implement the fuse file system handler functions and completed the implementions of each method, but I am not as confident in the logic that went into them as the previous methods.

I was not able to test easily for this project. The test will not run successfully but all of the code has been written. It would take an excessive amount of debugging to fix the logical errors wherever they might exist, but despite that I have learned a great deal about memory structures through creating a user level file system management library.