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EEL 5737 – EDGE
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Homework 1

- Describe the contents of raw blocks 2, 4, and 6

Raw Block 2 contains the bitmap of the data blocks, and which are currently free, and which are occupied.

Raw Block 4 shows one of the inode tables. These are used to store the metadata for the inodes including, type, size, refcnt.

Raw Block 6 shows the contents of the first data block, in which is contained the root directory (inode = 0) filenames and inodes.

- What are the inode numbers for the /, /foo, and /bar directories?

/ = 0, /foo = 2, /bar = 3

- What are the inode numbers for all files stored in this file system?

MAX_NUM_INODES = 16
Since the maximum number of inodes is set to 16 the inode numbers of all files are contained in the range 0-15.

- Read Method Description

To ensure that the inode is valid two checks are done. The first check asses if the file_inode_number is in the range of acceptable inode values (0->MAX_NUM_INODES-1). The next check assesses whether or not the inode is FILE based on its type. The final validity check compares the offset to the MAX_FILE_SIZE to ensure it is within these bounds. An Inode object is created to yield the BLOCKS associated with it. These block numbers are iterated through and the bytearrays are read from the blocks and concatenated with the previous blocks. The file data is then reduced to a segment stretching from the offset index to the tail index and only this section is returned.

- Cat Method Description

This method takes in a filename and prints the contents to the terminal. The majority of the functionality is error handling or taken on by the Read and Lookup methods. First a FileName object is instantiated so that the Lookup method can evaluate whether or not the filename is present in the current directory. If the inode is not found an error is returned. Next a InodeNumber object is instantiated to establish what type the Inode is and will return an error if the type is not a FILE. Finally, the Read method is

called and instructed to return all contents of the file, and these returned contents are printed to the terminal.

- LS Method Description

An INODE_ENUM is established so that Inode types can be mapped to their corresponding suffix's. An Inode object is instantiated so that the current working directory's blocks can be obtained. All of the blocks are then iterated through. Within each block each inode entry is iterated through and the filename and inode values are obtained. If the inode has a valid filename then the inode type is also obtained by "peeking" into that inode. Finally, all of the valid inodes across all of the cwd's blocks are combined with their respective suffix's and printed to the terminal.