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Volume Control Block:
Our volume control block will be the first block in our volume. It will contain the information about our volume.

```
typedef struct VCB {
	int num_blocks; // total number of blocks in volume
	int num_free_blocks; // how many free blocks remaining
	int block_size; // size of a block in bytes

	// keeps track of our free space which uses the counting method
	// our implementation for the counting method uses a Map data structure
	struct Map free_blocks;

	int root_dir; // index of the root directory
	int volume_type; // will be a magic number
} VCB;
```

Free Space:
We will track free space using the counting method because it is more efficient than bitmaps, and it is probably easier to implement than the other methods of managing free space.

Example:
Blue = Free Blocks

0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15

Location	Count
5	5
12	3

Directory Entry:
The directory entry is the first entry in the logical block array that contains the description of the file located at this directory or additional directories located at this directory.

```
typedef struct dir_entry {
      char name[64]; // identifier for the entry
      int location; // index of the entry's location
      int size; // size of the entry in bytes
      int is_directory; // flag for if the entry is a directory or a file

      Time creation_date; // date the entry was created
      Time last_modified; // date the entry was last modified
      Time last_opened; // date the entry was last opened
} dir_entry;
```

Metadata:
The metadata we will have includes: the file's creation date, the date it was last modified, and the date it was last opened.