Exercise 2 - File system operations

Started: Oct 14 at 1:34am

Quiz Instructions

You are asked to identify operations on a file system given an initial state. The way we represent the file system is shown below.

```
inode bitmap 11110000
inodes       [d a:0 r:3] [f a:1 r:1] [f a:-1 r:1] [d a:2 r:2] [] ...
data bitmap  11100000
data         [(.,0) (..,0) (y,1) (z,2) (f,3)] [u] [(.,3) (..,0)] [] ...
```

This file system has eight inodes and eight data blocks. The root directory contains three entries (other than "." and ".."), to "y", "z", and "f". By looking up inode 1, we can see that "y" is a regular file (type f), with a single data block allocated to it (address 1). In that data block 1 are the contents of the file "y": namely, "u". We can also see that "z" is an empty regular file (address field set to -1), and that "f" (inode number 3) is a directory, also empty. You can also see from the bitmaps that the first four inode bitmap entries are marked as allocated, as well as the first three data bitmap entries.

Question 1 — 1 pts

Given the following initial state:

```
inode bitmap  10000000
inodes        [d a:0 r:2] [] [] [] [] [] [] []
data bitmap   10000000
data          [(.,0) (..,0)] [] [] [] [] [] [] []
```

Which command will lead to the following state:

```
inode bitmap  11000000
inodes        [d a:0 r:3] [d a:1 r:2] [] [] [] [] [] []
data bitmap   11000000
data          [(.,0) (..,0) (n,1)] [(.,1) (..,0)] [] [] [] [] [] []
```

- ◯ mkdir("/n")

- ◯ creat("/n")
- ◯ unlink("/n")
- ◯ mkdir("/")
- ◯ fd = open("/n");

Question 2

1 pts

Given the following initial state (which is the final state from the previous question)

```
inode bitmap  11000000
inodes        [d a:0 r:3] [d a:1 r:2] [] [] [] [] [] []
data bitmap   11000000
data          [(.,0) (..,0) (n,1)] [(.,1) (..,0)] [] [] [] [] [] []
```

Which command will lead to the following state:

```
inode bitmap  11100000
inodes        [d a:0 r:3] [d a:1 r:2] [f a:-1 r:1] [] [] [] [] []
data bitmap   11000000
data          [(.,0) (..,0) (n,1) (w,2)] [(.,1) (..,0)] [] [] [] [] [] []
```

- ◯ creat("/w")
- ◯ create("/n/w")
- ◯ mkdir("/w")
- ◯ fd=open("/n/w", O_WRONLY|O_CREAT); write(fd, buf, BLOCKSIZE); close(fd)

Question 3

1 pts

Given the following initial state (which is the final state from the previous question)

```
inode bitmap  11100000
inodes        [d a:0 r:3] [d a:1 r:2] [f a:-1 r:1] [] [] [] [] []
data bitmap   11000000
data          [(.,0) (..,0) (n,1) (w,2)] [(.,1) (..,0)] [] [] [] [] [] []
```

Which command will lead to the following state:

```
inode bitmap  11110000
inodes        [d a:0 r:3] [d a:1 r:2] [f a:-1 r:1] [f a:2 r:1] [] [] [] []
data bitmap   1110000
data          [(.,0) (..,0) (n,1) (w,2)] [(.,1) (..,0) (x,3)] [o] [] [] [] [] []
```

- ◯ fd=open("/n/x", O_CREAT|O_WRONLY); write(fd, "o", BLOCKSIZE); close(fd);
- ◯ creat("/x")
- ◯ mkdir("/n/x")
- ◯ creat("/n/x")

Question 4

1 pts

Given the following initial state (which is the final state from the previous question)

```
inode bitmap 11110000
inodes [d a:0 r:3] [d a:1 r:2] [f a:-1 r:1] [f a:2 r:1] [] [] [] []
data bitmap 1100000
data   [(.,0) (..,0) (n,1) (w,2)] [(.,1) (..,0) (x,3)] [o] [] [] [] [] []
```

Which command will lead to the following state:

```
inode bitmap 11010000
inodes [d a:0 r:3] [d a:1 r:2] [] [f a:2 r:1] [] [] [] []
data bitmap 1100000
data [(.,0) (..,0) (n,1)] [(.,1) (..,0) (x,3)] [o] [] [] [] [] []
```

- ◯ unlink("/w");
- ◯ link("/n/w")
- ◯ rmdir("/w")

- rmdir("/n/w")

Question 5

1 pts

Given the following initial state (which is the final state question 4)

```
inode bitmap 11010000
inodes [d a:0 r:3] [d a:1 r:2] [] [f a:2 r:1] [] [] [] []
data bitmap 11100000data [(.,0) (..,0) (n,1)] [(.,1) (..,0) (x,3)] [o] [] [] []
[] []
```

What is the new state when the following command is run? Assume that the first free inode or data block is selected if a new inode or data block needs to be used.

```
mkdir("/n/y")
```

-
```
inode bitmap 11110000
inodes [d a:0 r:3] [d a:1 r:3] [d a:3 r:2] [f a:2 r:1] [] [] [] []
data bitmap 11110000
data [(.,0) (..,0) (n,1)] [(.,1) (..,0) (x,3) (y,2)] [o] [(.,2)(..,1)] [] []
[] []
```

-
```
inode bitmap 11110000
inodes [d a:0 r:3] [d a:1 r:2] [f a:3 r:1] [f a:2 r:1] [] [] [] []
data bitmap 11110000
data [(.,0) (..,0) (n,1)] [(.,1) (..,0) (x,3) (y,2)] [o] [(.,2)(..,1)] [] []
[] []
```

-
```
inode bitmap 11110000
inodes [d a:0 r:3] [d a:1 r:3] [d a:3 r:3] [f a:2 r:1] [] [] [] []
data bitmap 111000000
data [(.,0) (..,0) (n,1)] [(.,1) (..,0) (x,3) (y,2)] [o] [(.,2)(..,2)] [] []
[] []
```

-
```
inode bitmap 11110000
inodes [d a:0 r:3] [d a:1 r:3] [d a:1 r:3] [f a:2 r:1] [] [] [] []
```

```
data bitmap 111100000
data [(.,0) (..,0) (n,1)] [(.,1) (..,0) (x,3) (y,2)] [o] [(.,2)(..,1)] [] []
[] []
```

Question 6 1 pts

Given the following initial state (which is the final state question 4)

```
inode bitmap 11010000
inodes [d a:0 r:3] [d a:1 r:2] [] [f a:2 r:1] [] [] [] []
data bitmap 11100000
data [(.,0) (..,0) (n,1)] [(.,1) (..,0) (x,3)] [o] [] [] [] [] []
```

What is the new state when the following command is run? Assume that the first free inode or data block is selected if a new inode or data block needs to be used.

```
unlink("/n/x")
```

- ```
  inode bitmap 11000000
  inodes [d a:0 r:3] [d a:1 r:2] [] [] [] [] [] []
  data bitmap 11000000
  data [(.,0) (..,0) (n,1)] [(.,1) (..,0) ] [] [] [] [] [] []
  ```

- ```
  inode bitmap 11010000
  inodes [d a:0 r:3] [d a:1 r:2] [] [f a:2 r:1] [] [] [] []
  data bitmap 11100000
  data [(.,0) (..,0) (n,1)] [(.,1) (..,0)] [] [] [] [] [] []
  ```

- ```
  inode bitmap 11000000
  inodes [d a:0 r:3] [d a:1 r:2] [] [] [] [] [] []
  data bitmap 11000000
  data [(.,0) (..,0) (n,1)] [(.,1) (..,0) (x,3)] [] [] [] [] [] []
  ```

- ```
  inode bitmap 11000000
  inodes [d a:0 r:3] [d a:1 r:1] [] [] [] [] [] []
  ```

```
data bitmap 11000000
data [(.,0) (..,0) (n,1)] [(.,1) (..,0)] [] [] [] [] [] []
```

Not saved Submit Quiz