

File system

因时间所限，没来得及在ddl前写完完整版报告，报告缺失部分可从 <https://github.com/efJerryYang/xv6-labs-2021> 仓库对应目录下查看

文件系统实验主要要完成的是两个部分，一个是将原来的其中一个直接索引改为添加的一个 doubly-indirect 的索引节点，以增大单个文件的最大容量，如下图所示，之后按照这个逻辑写代码即可：

0-10: direct

11: singly indirect

12: doubly indirect

| index | addrs[i] | singly indirect | doubly indirect |
|-------|----------|--|-----------------|
| 0 | | --> [data block 0] | |
| 1 | | --> [data block 1] | |
| 2 | | --> [data block 2] | |
| 3 | | --> [data block 3] | |
| ... | | --> [data block ...] | |
| 9 | | --> [data block 9] | |
| 10 | | --> [data block 10] | |
| 11 | | --> index block 0 | |
| | | [entry 0] --> [data block 11] | |
| | | [entry 1] --> [data block 12] | |
| | | [entry 2] --> [data block 13] | |
| | | [entry ...] --> [data block ...] | |
| | | [entry 255] --> [data block 266] | |
| 12 | | --> index block 1 | |
| | | [entry 0] --> index block 2 | |
| | | [entry 0] --> [data block 267] | |
| | | [entry 1] --> [data block 268] | |
| | | [entry 2] --> [data block 269] | |
| | | [entry ...] --> [data block ...] | |
| | | [entry 255] --> [data block 522] | |
| | | [entry 1] --> index block 3 | |
| | | [entry 0] --> [data block 523] | |
| | | [entry 1] --> [data block 524] | |
| | | [entry 2] --> [data block 525] | |
| | | [entry ...] --> [data block ...] | |
| | | [entry 255] --> [data block 776] | |
| | | [entry ...] --> index block ... | |
| | | [entry 0] --> [data block ...] | |
| | | [entry 1] --> [data block ...] | |
| | | [entry 2] --> [data block ...] | |
| | | [entry ...] --> [data block ...] | |
| | | [entry 255] --> [data block ...] | |
| | | [entry 255] --> index block 255 | |
| | | [entry 0] --> [data block 65547] | |
| | | [entry 1] --> [data block 65548] | |
| | | [entry 2] --> [data block 65549] | |
| | | [entry ...] --> [data block ...] | |
| | | [entry 255] --> [data block 65802] | |

第二个部分是添加一个符号链接，主要的整体逻辑很自然，主要遇到的问题是没理解清楚题干给的 `O_NOFOLLOW` 的意思，导致代码完成之后评测始终通过不了，之后注意到问题在于没理解 `O_NOFOLLOW` 是用于强调访问时不访问到最下层指向的 inode 而是直接返回当前符号链接的 inode。这个点弄清楚了之后就能跑过测试了

```
make[1]: Leaving directory '/home/lydia/projects/xv6-labs-2021'
== Test running bigfile ==
$ make qemu-gdb
running bigfile: OK (257.6s)
== Test running symlinktest ==
$ make qemu-gdb
(1.6s)
== Test  symlinktest: symlinks ==
symlinktest: symlinks: OK
== Test  symlinktest: concurrent symlinks ==
symlinktest: concurrent symlinks: OK
== Test usertests ==
$ make qemu-gdb
usertests: OK (390.6s)
== Test time ==
time: OK
Score: 100/100
lydia@ubuntu-22-hp-040f1b4d:~/projects/xv6-labs-2021$ git push
```