

# File Project

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## Basic Submission

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1. Build and run **tiny**, using all three of the arguments - create, write, read. You can read above and study main in bio.c for the current content of these three arguments. Copy/paste your run log here.

### create

```
lpittman@DESKTOP-S59F40M:~/CPSC-405/CPSC-405/File_Project$ ./tiny create
create fs file.
inode num: 1, type: 1
lpittman@DESKTOP-S59F40M:~/CPSC-405/CPSC-405/File_Project$
```

### write

```
lpittman@DESKTOP-S59F40M:~/CPSC-405/CPSC-405/File_Project$ ./tiny write
manipulate fs file with writes.
fs : 3
fd1: 0
tfs_write bytes: 9
fd2: 1
tfs_write bytes: 48
tfs_write bytes: 48
fd3: 2
tfs_write bytes: 48
fd4: 3
tfs_write bytes: 48
lpittman@DESKTOP-S59F40M:~/CPSC-405/CPSC-405/File_Project$
```

### read

```
lpittman@DESKTOP-S59F40M:~/CPSC-405/CPSC-405/File_Project$ ./tiny read
manipulate fs file with reads.
fs : 3
fd3: 0
tfs_read bytes: fd: 0, bytes read: 19 value read: Writing data to anoEF
fd4: 1
tfs_read bytes: fd: 1, bytes read: 47 value read: Writing data to my file. ZYXWVUTSRQPONMLKJIHGFE
lpittman@DESKTOP-S59F40M:~/CPSC-405/CPSC-405/File_Project$
```

```
lpittman@DESKTOP-S59F40M:~/CPSC-405/CPSC-405/File_Project$ ls
bio.c  bio.o  defs.h  file.c  file.o  fs.h  makefile  proc.h  tfsfile.c  tiny  types.h  utilities
bio.h  buf.h  fcntl.h  file.h  fs.c  fs.o  param.h  stat.h  tfsfile.o  tinyfs  user.h
lpittman@DESKTOP-S59F40M:~/CPSC-405/CPSC-405/File_Project$
```

```
Block 0 - Not used.
s
tinyf
ÿ G
A%<88>
A%<88>
A%<88>
```

2. Update **main** in **bio.c** to write data to a file you create. Also update **main** to read data from your file. For both of these updates, I suggest you retain small sizes for writes and reads for your initial update. Copy/paste your run log here.

#### write

```
lpittman@DESKTOP-S59F40M:~/CPSC-405/CPSC-405/File_Project$ ./tiny write
manipulate fs file with writes.
fs : 3

fd1: 0
tfs_write bytes: 9
fd2: 1
tfs_write bytes: 48
tfs_write bytes: 48
fd3: 2
tfs_write bytes: 48
fd4: 3
tfs_write bytes: 48
-----
fd5: 4
tfs_write bytes: 48
-----
lpittman@DESKTOP-S59F40M:~/CPSC-405/CPSC-405/File_Project$
```

#### read

```
lpittman@DESKTOP-S59F40M:~/CPSC-405/CPSC-405/File_Project$ ./tiny read
manipulate fs file with reads.
fs : 3
fd3: 0
tfs_read bytes: fd: 0, bytes read: 19 value read: Writing data to ano
fd4: 1
tfs_read bytes: fd: 1, bytes read: 47 value read: Writing data to my file. ZYXWVUTSRQPONMLKJIHGFE
-----
fd5: 2
tfs_read bytes: fd: 2, bytes read: 47 value read: Lauren was here... 00000HHHhhh
-----
lpittman@DESKTOP-S59F40M:~/CPSC-405/CPSC-405/File_Project$
```

3. Use **hexdump** to dump the file **tinyfs**, which is the TFS TDD to verify that your files are on the TDD. You must locate several aspects of them. Their names, inode numbers, and data block(s) in the root directory. Copy/paste your use of hexdump here. Annotate your copy/paste to demonstrate understanding.

### First run...

```
lpittman@DESKTOP-S59F40M:~/CPSC-405/CPSC-405/File_Project/utilities$ ./hexdump ../tinyfs
block: 00000:
0x00000000  426c6f63 6b203020 2d204e6f 74207573 65642e00 00000000 00000000 00000000  Block 0 - Not used.
0x00000020  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x00000040  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x00000060  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x00000080  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x000000a0  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x000000c0  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x000000e0  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x00000100  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x00000120  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x00000140  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x00000160  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x00000180  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x000001a0  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x000001c0  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x000001e0  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
block: 00001:
0x00000200  00040000 f8030000 20000000 00000000 74696e79 66730000 00000000 00000000  tinyfs
0x00000220  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x00000240  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x00000260  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x00000280  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x000002a0  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x000002c0  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x000002e0  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x00000300  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x00000320  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x00000340  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x00000360  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x00000380  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x000003a0  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x000003c0  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x000003e0  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
block: 00002:
0x00000400  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x00000420  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x00000440  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x00000460  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x00000480  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x000004a0  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x000004c0  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x000004e0  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x00000500  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x00000520  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x00000540  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
```

[illegible]



[illegible]

Block 8 and beyond are used to hold data of the files.

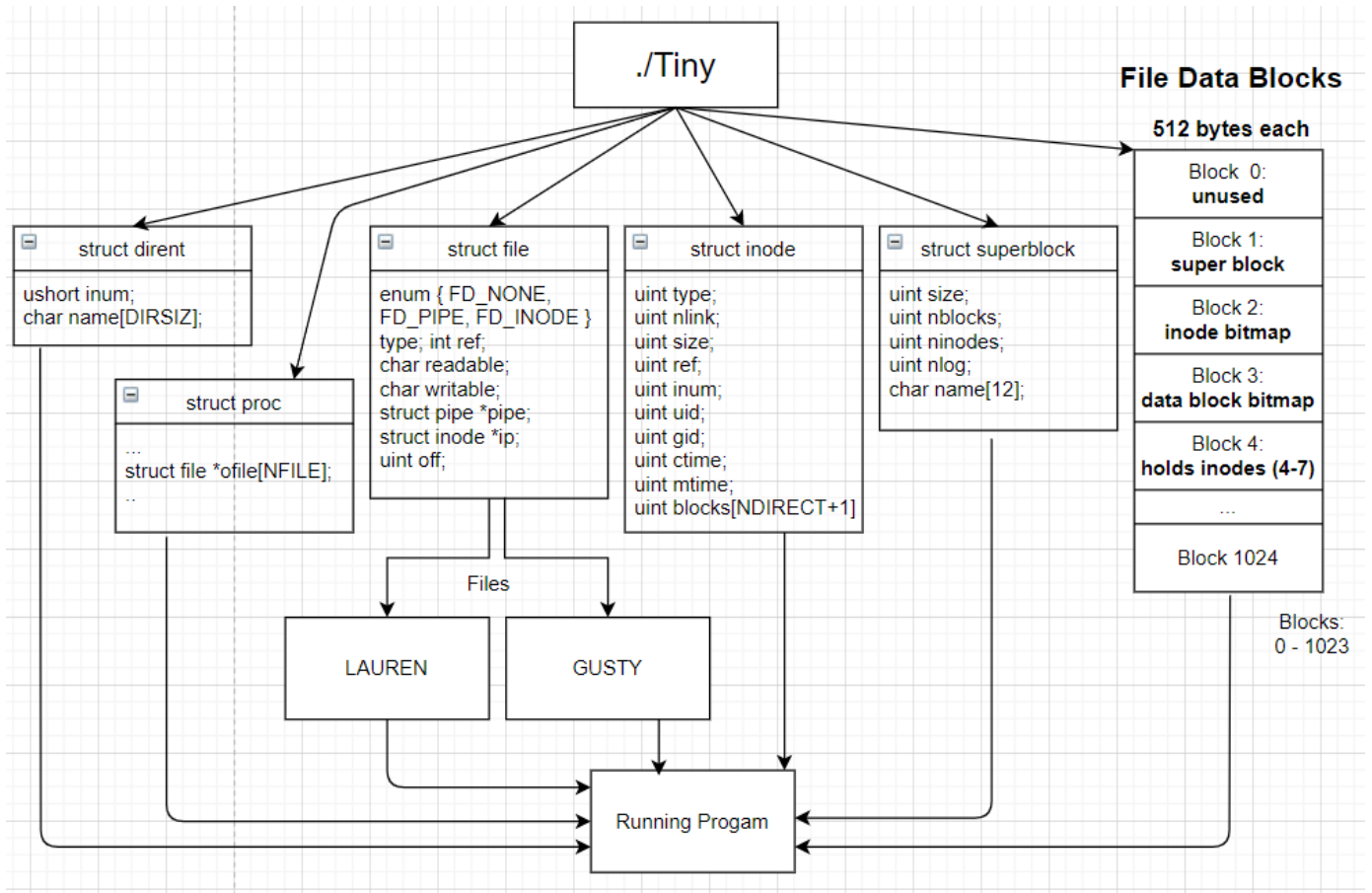
```
0x00001100 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x00001120 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x00001140 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x00001160 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x00001180 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x000011a0 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x000011c0 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x000011e0 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
block: 00009:
0x00001200 4c617572 656e2077 61732068 6572652e 2e2e204f 4f4f4f4f 48484868 68686800 Lauren was here... 00000HHHHhhh
0x00001220 72656164 00000000 6d616e69 70756c61 00000000 00000000 00000000 00000000 read manipula
0x00001240 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x00001260 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x00001280 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x000012a0 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x000012c0 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x000012e0 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x00001300 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x00001320 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x00001340 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x00001360 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x00001380 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x000013a0 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x000013c0 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x000013e0 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
lpittman@DESKTOP-S59F40M:~/CPSC-405/CPSC-405/File_Project/utilities$
```

## Another run...

```
lpittman@DESKTOP-S59F40M:~/CPSC-405/CPSC-405/File_Project/utilities$ ./hexdump -s10 -13 ../tinyfs
block: 00010:
0x00001400 48454c4c 4f20544f 20455645 52594f4e 4520494e 20746865 20776f72 6c642120 HELLO TO EVERYONE IN the world!
0x00001420 48617070 79204e65 77205965 61727321 57726974 696e6720 64617461 20746f20 Happy New Years!Writing data to
0x00001440 616e6f74 68657220 66696c65 2e203132 33343536 37383961 62636465 66676821 another file. 123456789abcdefgh!
0x00001460 bbbbbbbb bbbbbbbb bbbbbbbb bbbbbbbb bbbbbbbb bbbbbbbb bbbbbbbb bbbbbbbb
0x00001480 bbbbbbbb bbbbbbbb bbbbbbbb bbbbbbbb bbbbbbbb bbbbbbbb bbbbbbbb bbbbbbbb
0x000014a0 bbbbbbbb bbbbbbbb bbbbbbbb bbbbbbbb bbbbbbbb bbbbbbbb bbbbbbbb bbbbbbbb
0x000014c0 bbbbbbbb bbbbbbbb bbbbbbbb bbbbbbbb bbbbbbbb bbbbbbbb bbbbbbbb bbbbbbbb
0x000014e0 bbbbbbbb bbbbbbbb bbbbbbbb bbbbbbbb bbbbbbbb bbbbbbbb bbbbbbbb bbbbbbbb
0x00001500 bbbbbbbb bbbbbbbb bbbbbbbb bbbbbbbb bbbbbbbb bbbbbbbb bbbbbbbb bbbbbbbb
0x00001520 bbbbbbbb bbbbbbbb bbbbbbbb bbbbbbbb bbbbbbbb bbbbbbbb bbbbbbbb bbbbbbbb
0x00001540 bbbbbbbb bbbbbbbb bbbbbbbb bbbbbbbb bbbbbbbb bbbbbbbb bbbbbbbb bbbbbbbb
0x00001560 bbbbbbbb bbbbbbbb bbbbbbbb bbbbbbbb bbbbbbbb bbbbbbbb bbbbbbbb bbbbbbbb
0x00001580 bbbbbbbb bbbbbbbb bbbbbbbb bbbbbbbb bbbbbbbb bbbbbbbb bbbbbbbb bbbbbbbb
0x000015a0 bbbbbbbb bbbbbbbb bbbbbbbb bbbbbbbb bbbbbbbb bbbbbbbb bbbbbbbb bbbbbbbb
0x000015c0 bbbbbbbb bbbbbbbb bbbbbbbb bbbbbbbb bbbbbbbb bbbbbbbb bbbbbbbb bbbbbbbb
0x000015e0 bbbbbbbb bbbbbbbb bbbbbbbb bbbbbbbb bbbbbbbb bbbbbbbb bbbbbbbb bbbbbbbb
block: 00011:
0x00001600 57726974 696e6720 64617461 20746f20 616e6f74 68657220 66696c65 2e203132 Writing data to another file. 12
0x00001620 33343536 37383961 62636465 66676821 00000000 00000000 00000000 00000000 3456789abcdefgh!
0x00001640 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x00001660 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x00001680 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x000016a0 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x000016c0 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x000016e0 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x00001700 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x00001720 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x00001740 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x00001760 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x00001780 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x000017a0 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x000017c0 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x000017e0 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
block: 00012:
0x00001800 57726974 696e6720 64617461 20746f20 6d792066 696c652e 205a5958 57565554 Writing data to my file. ZYXWVUT
0x00001820 53525150 4f4e4d4c 4b4a4948 47464544 4c617572 656e2077 61732068 6572652e SRQPONMLKJIHGFEDLauren was here.
0x00001840 2e2e2e20 4f4f4f4f 4f484848 48484848 48686868 68007265 61640000 00000000 ... 00000HHHHHHHHhh read
0x00001860 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x00001880 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x000018a0 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x000018c0 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x000018e0 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x00001900 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x00001920 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x00001940 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x00001960 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x00001980 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x000019a0 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x000019c0 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x000019e0 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
lpittman@DESKTOP-S59F40M:~/CPSC-405/CPSC-405/File_Project/utilities$
```



4. Create an annotated diagram of TFS. Show TFS structures and how they interconnect. Include the superblock, the inode bitmap, the data bitmap, the inodes, and two files - one of which is what you added to main in step 2. Also show file descriptors, struct proc, struct file, struct inode and how a file descriptors are converted to inodes. When creating this diagram, use the hex dump from step 3 to demonstrate your understanding. Place your annotated diagram here.



5. Create a function call trace starting with **tsf\_read**. Create this trace by reading the code. For each function, describe the parameters and a detailed description of what the function does. For example:

1. `tsf_read`'s (in file `tfssfile.c`) parameters are a file descriptor, a buffer, and a size to read. `tsf_read` calls `fd_to_file` to convert the file descriptor to a `struct file`. Then `tsf_read` calls `fileread` to continue reading the file.

2. `fd_to_file` (in file `tfssfile.c`) parameters are an `fd` and a `struct file **`. `fd_to_file` ensures the `fd` is within range and returns the pointer to the `struct file` in the `proc`'s `ofile[]`.

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3. `fileread` (in `file.c`) parameters are a `struct file *f`, `char *address`, and an `int`. In this function, we are first checking to see if the `struct file f` is readable. If the `f` is 0, then we return -1. Next, we check if `f`'s type is equal to the enum type: `FD_INODE`. If so, then we can read from the file. Else the `panic()` function is called and we return -1 to show failure.

4. `panic(char *string)` parameters is a `char *string`. In this function, it takes the `panic("..")` parameters and prints the string out. For example, if it says `panic("file failed to open")`, the following is printed to the screen:  
failed failed to open.

6. Update `hexdump` to include a new flag. You can select the flag. For example, you could add a `-i` flag that dumps inodes, or you can add a `-e` flag that has the end block. Copy/paste a run log of `hexdump` applied to `tinyfs` with your new flag.

**We created the -i flag. This prints out the inodes from blocks 4-7.**

```

ipittman@DESKTOP-S59F40M:~/CPSC-405/CPSC-405/file_Project/utilities$ ./hexdump -i ../tinyfs
filename: ../tinyfs
block: 00004:
0x00000800  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x00000820  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x00000840  01000000 00000000 50000000 06000000 01000000 bcbc8460 00000000 08000000
0x00000860  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x00000880  02000000 01000000 09000000 01000000 02000000 0fbc8460 00000000 09000000
0x000008a0  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x000008c0  02000000 01000000 60000000 01000000 03000000 dfbc8460 00000000 0a000000
0x000008e0  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x00000900  02000000 01000000 30000000 01000000 04000000 dfbc8460 00000000 0b000000
0x00000920  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x00000940  02000000 01000000 60000000 01000000 05000000 dfbc8460 00000000 0c000000
0x00000960  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x00000980  02000000 01000000 30000000 01000000 06000000 79e08560 00000000 09000000
0x000009a0  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x000009c0  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x000009e0  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
block: 00005:
0x00000a00  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x00000a20  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x00000a40  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x00000a60  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x00000a80  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x00000aa0  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x00000ac0  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x00000ae0  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x00000b00  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x00000b20  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x00000b40  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x00000b60  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x00000b80  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x00000ba0  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x00000bc0  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x00000be0  00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

```

```

block: 00006:
0x00000c00 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x00000c20 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x00000c40 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x00000c60 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x00000c80 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x00000ca0 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x00000cc0 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x00000ce0 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x00000d00 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x00000d20 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x00000d40 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x00000d60 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x00000d80 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x00000da0 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x00000dc0 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x00000de0 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
block: 00007:
0x00000e00 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x00000e20 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x00000e40 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x00000e60 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x00000e80 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x00000ea0 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x00000ec0 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x00000ee0 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x00000f00 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x00000f20 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x00000f40 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x00000f60 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x00000f80 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x00000fa0 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x00000fc0 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x00000fe0 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
lpittman@DESKTOP-S59F40M:~/CPSC-405/CPSC-405/File_Project/utilities$

```

Another example: we can only use the -i flag by itself.

```

lpittman@DESKTOP-S59F40M:~/CPSC-405/CPSC-405/File_Project/utilities$ ./hexdump -s0 -l2 -i ../tinyfs
-i goes by itself.
Invalid number of arguments. 5
lpittman@DESKTOP-S59F40M:~/CPSC-405/CPSC-405/File_Project/utilities$

```

```

Invalid number of arguments. 5
lpittman@DESKTOP-S59F40M:~/CPSC-405/CPSC-405/File_Project/utilities$ ./hexdump -s0 -i ../tinyfs
-i goes by itself.
Invalid number of arguments. 4
lpittman@DESKTOP-S59F40M:~/CPSC-405/CPSC-405/File_Project/utilities$

```

```

Invalid number of arguments. 4
lpittman@DESKTOP-S59F40M:~/CPSC-405/CPSC-405/File_Project/utilities$ ./hexdump -l2 -i ../tinyfs
-i goes by itself.
Invalid number of arguments. 4
lpittman@DESKTOP-S59F40M:~/CPSC-405/CPSC-405/File_Project/utilities$

```

7. Submit your updated `bio.c` and `hexdump.c` files.

**Submitted :)  
We love you, Gusty <3  
Have a wonderful summer and thank you for  
teaching such an awesome class this semester!**

## Advanced Submission

1. Create a `tinyfs` file with over 512 bytes of data. This will cause a second block to be allocated. See that the inode indicates two data blocks. Copy/paste a hexdump of `tinyfs` showing your large file.

[illegible]



## Then we do hexdump.c

```
block: 00013:
0x00001a00 4c617572 656e2077 61732068 6572652e 2e2e204f 4f4f4f4f 48484868 68686800 Lauren was here... 0000HHHHhh
0x00001a20 71756573 746966e 20380066 64363a20 00000000 00000000 00000000 00000000 question 8 fd6:
0x00001a40 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x00001a60 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x00001a80 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x00001aa0 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x00001ac0 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x00001ae0 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x00001b00 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x00001b20 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x00001b40 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x00001b60 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x00001b80 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x00001ba0 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x00001bc0 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x00001be0 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
block: 00014:
0x00001c00 41727361 6c616e2c 20746865 20666965 73747920 6c69666e 20776173 20686572 Arsalan, the fiesty lion was her
0x00001c20 652e7373 73737373 73737373 73737373 73737373 73737373 73737373 73737373 e.sssssssssssssssssssssssss
0x00001c40 73737373 73737373 73737373 73737373 73737373 73737373 73737373 73737373 sssssssssssssssssssssssss
0x00001c60 73737373 73737373 73737373 73737373 73737373 73737373 73737373 73737373 sssssssssssssssssssssssss
0x00001c80 73737373 73737373 73737373 73737373 73737373 73737373 73737373 73737373 sssssssssssssssssssssssss
0x00001ca0 73737373 73737373 73737373 73737373 73737373 73737373 73737373 73737373 sssssssssssssssssssssssss
0x00001cc0 73737373 73737373 73737373 73737373 73737373 73737373 73737373 73737373 sssssssssssssssssssssssss
0x00001ce0 73737373 73737373 73737373 73737373 73737373 73737373 73737373 73737373 sssssssssssssssssssssssss
0x00001d00 73737373 73737373 73737373 73737373 73737373 73737373 73737373 73737373 sssssssssssssssssssssssss
0x00001d20 73737373 73737373 73737373 73737373 73737373 73737373 73737373 73737373 sssssssssssssssssssssssss
0x00001d40 73737373 73737373 73737373 73737373 73737373 73737373 73737373 73737373 sssssssssssssssssssssssss
0x00001d60 73737373 73737373 73737373 73737373 73737373 73737373 73737373 73737373 sssssssssssssssssssssssss
0x00001d80 73737373 73737373 73737373 73737373 73737373 73737373 73737373 73737373 sssssssssssssssssssssssss
0x00001da0 73737373 73737373 73737373 73737373 73737373 73737373 73737373 73737373 sssssssssssssssssssssssss
0x00001dc0 73737373 73737373 73737373 73737373 73737373 73737373 73737373 73737373 sssssssssssssssssssssssss
0x00001de0 73737373 73737373 73737373 73737373 73737373 73737373 73737373 73737373 sssssssssssssssssssssssss
block: 00015:
0x00001e00 73737373 73737373 73737373 73737373 73737373 73737373 73737373 73737373 sssssssssssssssssssssssss
0x00001e20 73737373 73737373 73737373 73737373 73737373 73737373 73737373 73737373 sssssssssssssssssssssssss
0x00001e40 73737373 73737373 73737373 73737373 73737373 73737373 73737373 73000000 sssssssssssssssssssssssss
0x00001e60 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x00001e80 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x00001ea0 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x00001ec0 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x00001ee0 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x00001f00 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x00001f20 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x00001f40 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x00001f60 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x00001f80 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x00001fa0 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x00001fc0 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x00001fe0 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
lpittman@DESKTOP-S59F40M:~/CPSC-405/CPSC-405/File_Project/utilities$
```

```
block: 00014:
0x00001c00 54657374 20636173 6520746f 20736565 20696620 64617461 20676f65 73206265 Test case to see if data goes be
0x00001c20 796f6e64 206f6e65 20626c6f 636b2061 6e642067 6f20746f 20746865 206e6578 yond one block and go to the nex
0x00001c40 7420626c 6f636b2e 20492077 696c6c20 74797065 20612062 756e6368 206f6620 t block. I will type a bunch of
0x00001c60 32732074 6f20636f 76657220 36303520 62797465 732e2032 32323232 32323232 2s to cover 605 bytes. 22222222
0x00001c80 32323232 32323232 32323232 32323232 32323232 32323232 32323232 32323232 22222222222222222222222222222222
0x00001ca0 32323232 32323232 32323232 32323232 32323232 32323232 32323232 32323232 22222222222222222222222222222222
0x00001cc0 32323232 32323232 32323232 32323232 32323232 32323232 32323232 32323232 22222222222222222222222222222222
0x00001ce0 32323232 32323232 32323232 32323232 32323232 32323232 32323232 32323232 22222222222222222222222222222222
0x00001d00 32323232 32323232 32323232 32323232 32323232 32323232 32323232 32323232 22222222222222222222222222222222
0x00001d20 32323232 32323232 32323232 32323232 32323232 32323232 32323232 32323232 22222222222222222222222222222222
0x00001d40 32323232 32323232 32323232 32323232 32323232 32323232 32323232 32323232 22222222222222222222222222222222
0x00001d60 32323232 32323232 32323232 32323232 32323232 32323232 32323232 32323232 22222222222222222222222222222222
0x00001d80 32323232 32323232 32323232 32323232 32323232 32323232 32323232 32323232 22222222222222222222222222222222
0x00001da0 32323232 32323232 32323232 32323232 32323232 32323232 32323232 32323232 22222222222222222222222222222222
0x00001dc0 32323232 32323232 32323232 32323232 32323232 32323232 32323232 32323232 22222222222222222222222222222222
0x00001de0 32323232 32323232 32323232 32323232 32323232 32323232 32323232 32323232 22222222222222222222222222222222
block: 00015:
0x00001e00 32323232 32323232 32323232 32323232 32323232 32323232 32323232 32323232 22222222222222222222222222222222
0x00001e20 32323232 32323232 32323232 32323232 32323232 32323232 32323232 32323232 22222222222222222222222222222222
0x00001e40 32323232 32323232 32323232 32323232 32323232 32323232 32323232 32000000 22222222222222222222222222222222
0x00001e60 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x00001e80 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x00001ea0 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x00001ec0 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x00001ee0 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x00001f00 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x00001f20 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x00001f40 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x00001f60 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x00001f80 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x00001fa0 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x00001fc0 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x00001fe0 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
```

- ```

block: 00016:
0x00002000 54657374 20636173 6520746f 20736565 20696620 64617461 20636f6e 74696e75 Test case to see if data continu
0x00002020 65732061 66746572 20612066 696c6520 6973206d 6164652e 20536f20 62617369 es after a file is made. So basi
0x00002040 63616c6c 7920696e 20746869 73207465 73742063 61736520 49207769 6c6c2063 cally in this test case I will c
0x00002060 6f766572 206f6e65 206f6620 74686520 626c6f63 6b732077 69746820 66756c6c over one of the blocks with full
0x00002080 20353132 20627974 6573206f 66206461 74612e20 41667465 72207468 61742049 512 bytes of data. After that I
0x000020a0 2077696f 6c206d61 6b652061 20616e6f 74686572 2066696c 6520616e 64207075 will make a another file and pu
0x000020c0 7420736f 6d652064 61746120 696e2069 742e2041 66746572 20746861 74206973 t some data in it. After that is
0x000020e0 20646f6e 65204920 77696c6c 20636f6e 74696e75 65207772 6974696e 67206461 done I will continue writing da
0x00002100 74612074 6f207468 65207072 6576696f 75732066 696c652e 20536f20 666f7220 ta to the previous file. So for
0x00002120 6578616d 706c6520 626c6f63 6b206f6e 65207769 6c6c2068 61766520 66696c65 example block one will have file
0x00002140 206f6e65 20646174 612e2042 6c6f636b 2074776f 2077696c 6c206861 76652066 one data. Block two will have f
0x00002160 696c6520 74776f20 64617461 2e20426c 6f636b20 74687265 65207769 6c6c2063 ile two data. Block three will c
0x00002180 6f6e7469 6e756520 66696c65 206f6e65 20646174 612e204e 6f772049 20736861 ontinue file one data. Now I sha
0x000021a0 6c6c2063 6f766572 20746869 7320626c 6f636b20 77697468 20323232 32323232 ll cover this block with 2222222
0x000021c0 32323232 32323232 32323232 32323232 32323232 32323232 32323232 32323232 22222222222222222222222222222222
0x000021e0 32323232 32323232 32323232 32323232 32323232 32323232 32323232 32323232 22222222222222222222222222222222
block: 00017:
0x00002200 48692049 20616d20 696e2066 696c6520 322e204d 00000000 00000000 00000000 Hi I am in file 2. M
0x00002220 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x00002240 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x00002260 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x00002280 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x000022a0 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x000022c0 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x000022e0 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x00002300 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x00002320 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x00002340 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x00002360 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x00002380 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x000023a0 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x000023c0 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x000023e0 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
block: 00018:
0x00002400 46696c65 3120636f 6e74696e 75656420 64617461 61616161 61616161 61616161 File1 continued dataaaaaaaaaaaaaa
0x00002420 61616161 61616161 61616161 61616161 00000000 00000000 00000000 00000000 aaaaaaaaaaaaaaaaaa
0x00002440 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x00002460 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x00002480 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x000024a0 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
0x000024c0 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

```

- ```
lpittman@DESKTOP-S59F40M:~/CPSC-405/CPSC-405/File_Project$ ./tiny stat LAUREN
fd : 0
goes here
size of LAUREN is 48
type of LAUREN is 2
dev of LAUREN is 0
Inode of LAUREN is 6
nLink of LAUREN is 1
lpittman@DESKTOP-S59F40M:~/CPSC-405/CPSC-405/File_Project$
```

4. `Tfs_mkdir` - equivalent to `mkdir`. Copy/paste a log showing your results.

```
LINK OF EXERCISE IS 1  
lpittman@DESKTOP-S59F40M:~/CPSC-405/CPSC-405/File_Project$ ./tiny mkdir spring_time  
Successful  
lpittman@DESKTOP-S59F40M:~/CPSC-405/CPSC-405/File_Project$
```

5. `Tfs_chdir` - equivalent to `chdir`. Copy/paste a log showing your results.

**Unsuccessful test case:**

```
lpittman@DESKTOP-S59F40M:~/CPSC-405/CPSC-405/File_Project$ ./tiny chdir GUSTY  
Hits this  
Unsuccessfull  
lpittman@DESKTOP-S59F40M:~/CPSC-405/CPSC-405/File_Project$
```