James Peacemaker

April 26, 2021

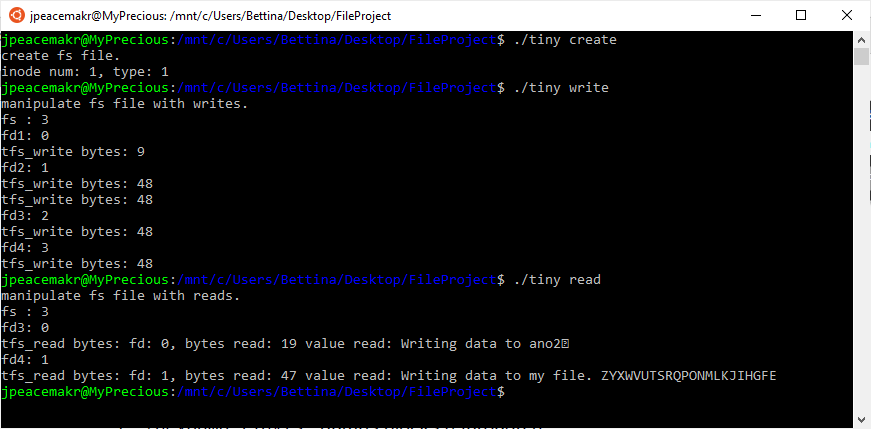
CPSC 405

File Project – Answer Document

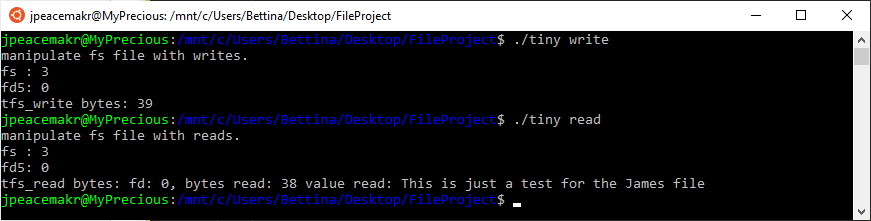
Basic Submission (earns a maximum of 88 points)

bio.c has several test cases. You will build and run TFS to understand the file system and how it is tested. You will use the hexdump tool on tinyfs to further your understanding.

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.



1. 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 you initial update. Copy/paste your run log here.



1. 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.

jpeacemakr@MyPrecious:/mnt/c/Users/Bettina/Desktop/FileProject/utilities$ ./hexdump ../tinyfs

block: 00000:

0x00000000 426c6f63 6b203020 2d204e6f 74207573 65642e00 00000000 00000000 00000000

Block 0 is not used.

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:

Block 1 is the superblock.

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:

Block 2 is the inode bitmap, but it is not used.

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

0x00000560 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

0x00000580 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

0x000005a0 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

0x000005c0 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

0x000005e0 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

block: 00003:

Block 3 is the data block bitmap. It is used to find free data blocks for files.

0x00000600 003f0000 00000000 00000000 00000000 00000000 00000000 00000000 00000000 ?

0x00000620 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

0x00000640 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

0x00000660 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

0x00000680 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

0x000006a0 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

0x000006c0 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

0x000006e0 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

0x00000700 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

0x00000720 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

0x00000740 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

0x00000760 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

0x00000780 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

0x000007a0 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

0x000007c0 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

0x000007e0 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

Blocks 4 through 7 hold inodes. Each inode is 64 bytes.

block: 00004:

0x00000800 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

0x00000820 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

0x00000840 01000000 00000000 50000000 02000000 01000000 d78b8460 00000000 08000000 P `

0x00000860 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

0x00000880 02000000 01000000 09000000 01000000 02000000 db8b8460 00000000 09000000 `

0x000008a0 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

0x000008c0 02000000 01000000 60000000 01000000 03000000 db8b8460 00000000 0a000000 ` `

0x000008e0 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

0x00000900 02000000 01000000 30000000 01000000 04000000 db8b8460 00000000 0b000000 0 `

0x00000920 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

0x00000940 02000000 01000000 30000000 01000000 05000000 db8b8460 00000000 0c000000 0 `

0x00000960 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

0x00000980 02000000 01000000 27000000 02000000 06000000 d1908460 00000000 0d000000 ' `

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

Blocks 8 and up hold the data of the files.

block: 00008:

0x00001000 02004755 53545900 00000000 00000000 03004845 4c4c4f57 4f524c44 00000000 GUSTY HELLOWORLD

0x00001020 0400416e 6f746865 72000000 00000000 05004d79 46696c65 00000000 00000000 Another MyFile

0x00001040 06004a61 6d657300 00000000 00000000 00000000 00000000 00000000 00000000 James

0x00001060 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

0x00001080 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

0x000010a0 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

0x000010c0 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

0x000010e0 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

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 434f4f50 45523132 33000000 00000000 00000000 00000000 00000000 00000000 COOPER123

0x00001220 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

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

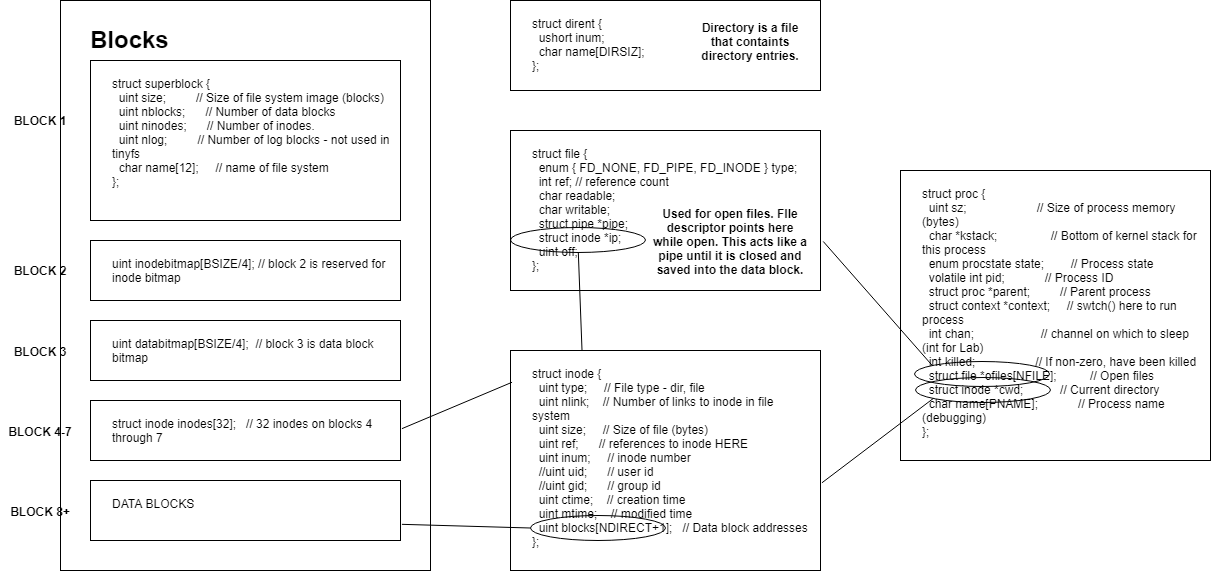
0x000013a0 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

0x000013c0 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

0x000013e0 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

jpeacemakr@MyPrecious:/mnt/c/Users/Bettina/Desktop/FileProject/utilities$

1. 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.



Block 0 is not used.

block: 00000:

. . .

Block 1 is the superblock.

block: 00001:

0x00000200 00040000 f8030000 20000000 00000000 74696e79 66730000 00000000 00000000 tinyfs **(This is the superblock structure used to store info about the file system).**

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 2 is the inode bitmap, but it is not used.

block: 00002:

. . .

Block 3 is the data block bitmap. It is used to find free data blocks for files.

block: 00003:

0x00000600 **003f0000** 00000000 00000000 00000000 00000000 00000000 00000000 00000000 ? **(each bit with a 1 represents a data block that has been used. 0 is unused.)**

0x00000620 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

0x00000640 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

0x00000660 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

0x00000680 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

0x000006a0 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

0x000006c0 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

0x000006e0 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

0x00000700 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

0x00000720 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

0x00000740 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

0x00000760 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

0x00000780 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

0x000007a0 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

0x000007c0 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

0x000007e0 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

Blocks 4 through 7 hold inodes. Each inode is 64 bytes.

**(These are inodes that point to files in the data blocks. Each inode is 64 bytes. There are 8 inodes per block. It looks like there are 6 inodes used.)**

block: 00004:

0x00000800 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

0x00000820 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

0x00000840 01000000 00000000 50000000 02000000 01000000 d78b8460 00000000 08000000**(1)** P `

0x00000860 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

0x00000880 02000000 01000000 09000000 01000000 02000000 db8b8460 00000000 09000000**(2)** `

0x000008a0 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

0x000008c0 02000000 01000000 60000000 01000000 03000000 db8b8460 00000000 0a000000**(3)** ` `

0x000008e0 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

0x00000900 02000000 01000000 30000000 01000000 04000000 db8b8460 00000000 0b000000**(4)** 0 `

0x00000920 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

0x00000940 02000000 01000000 30000000 01000000 05000000 db8b8460 00000000 0c000000**(5)** 0 `

0x00000960 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

0x00000980 02000000 01000000 27000000 02000000 06000000 d1908460 00000000 0d000000**(6)** ' `

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:

. . .

block: 00007:

. . .

Blocks 8 and up hold the data of the files.

**(There are 4 data files here in two different blocks: (1) GUSTY HELLOWORLD, (2) Another MyFile, (3) James and (4) COOPER123.)**

block: 00008:

0x00001000 02004755 53545900 00000000 00000000 03004845 4c4c4f57 4f524c44 00000000 GUSTY HELLOWORLD **(1)**

0x00001020 0400416e 6f746865 72000000 00000000 05004d79 46696c65 00000000 00000000 Another MyFile **(2)**

0x00001040 06004a61 6d657300 00000000 00000000 00000000 00000000 00000000 00000000 James **(3)**

0x00001060 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

0x00001080 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

0x000010a0 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

0x000010c0 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

0x000010e0 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

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 434f4f50 45523132 33000000 00000000 00000000 00000000 00000000 00000000 COOPER123 **(4)**

0x00001220 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

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

1. Create a function call trace starting with tfs\_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. tfs\_read’s (in file tfsfile.c) parameters are a file descriptor, a buffer, and a size to read. tfs\_read calls fd\_to\_file to convert the file descriptor to a struct file. Then tfs\_read calls fileread to continue reading the file.
   2. fd\_to\_file (in file tfsfile.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[].
   3. fileread (in file.c) parameters are … continue

Place your function call trace here.

jpeacemakr@MyPrecious:/mnt/c/Users/Bettina/Desktop/FileProject$ ./tiny create

create fs file.

Trace: starting bread() in bio.c

Trace: bread() reads from the file system to the buffer.

Trace: bread() arguments: block (uint block number being read), buf (buffer)

Trace: starting bread() in bio.c

Trace: bread() reads from the file system to the buffer.

Trace: bread() arguments: block (uint block number being read), buf (buffer)

Trace: starting bread() in bio.c

Trace: bread() reads from the file system to the buffer.

Trace: bread() arguments: block (uint block number being read), buf (buffer)

Trace: starting bread() in bio.c

Trace: bread() reads from the file system to the buffer.

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Trace: starting bread() in bio.c

Trace: bread() reads from the file system to the buffer.

Trace: bread() arguments: block (uint block number being read), buf (buffer)

Trace: starting bread() in bio.c

Trace: bread() reads from the file system to the buffer.

Trace: bread() arguments: block (uint block number being read), buf (buffer)

Trace: starting bread() in bio.c

Trace: bread() reads from the file system to the buffer.

Trace: bread() arguments: block (uint block number being read), buf (buffer)

inode num: 1, type: 1

jpeacemakr@MyPrecious:/mnt/c/Users/Bettina/Desktop/FileProject$ ./tiny write

manipulate fs file with writes.

fs : 3

Trace: starting bread() in bio.c

Trace: bread() reads from the file system to the buffer.

Trace: bread() arguments: block (uint block number being read), buf (buffer)

Trace: starting bread() in bio.c

Trace: bread() reads from the file system to the buffer.

Trace: bread() arguments: block (uint block number being read), buf (buffer)

Trace: starting bread() in bio.c

Trace: bread() reads from the file system to the buffer.

Trace: bread() arguments: block (uint block number being read), buf (buffer)

Trace: starting bread() in bio.c

Trace: bread() reads from the file system to the buffer.

Trace: bread() arguments: block (uint block number being read), buf (buffer)

Trace: starting bread() in bio.c

Trace: bread() reads from the file system to the buffer.

Trace: bread() arguments: block (uint block number being read), buf (buffer)

Trace: starting bread() in bio.c

Trace: bread() reads from the file system to the buffer.

Trace: bread() arguments: block (uint block number being read), buf (buffer)

Trace: starting bread() in bio.c

Trace: bread() reads from the file system to the buffer.

Trace: bread() arguments: block (uint block number being read), buf (buffer)

Trace: starting bmap() in fs.c

Trace: bmap() return the disk block address of the nth block in inode ip. If there is no such block, bmap allocates one.

Trace: bmap() arguments: ip (inode struct), uint bn (block number)

Trace: starting bread() in bio.c

Trace: bread() reads from the file system to the buffer.

Trace: bread() arguments: block (uint block number being read), buf (buffer)

Trace: starting bmap() in fs.c

Trace: bmap() return the disk block address of the nth block in inode ip. If there is no such block, bmap allocates one.

Trace: bmap() arguments: ip (inode struct), uint bn (block number)

fd5: 0

Trace: starting fd\_to\_file() in tfsfile.c

Trace: fd\_to\_file() takes a file descriptor and creates a struct file.

Trace: fd\_to\_file() arguments: fd (file descriptor for file), file

Trace: starting filewrite() in file.c

Trace: filewrite() writes a specified number of characters to a file.

Trace: filewrite() arguments: file (file struct), addr (string pointer), int n (length of string)

Trace: starting bmap() in fs.c

Trace: bmap() return the disk block address of the nth block in inode ip. If there is no such block, bmap allocates one.

Trace: bmap() arguments: ip (inode struct), uint bn (block number)

Trace: starting bread() in bio.c

Trace: bread() reads from the file system to the buffer.

Trace: bread() arguments: block (uint block number being read), buf (buffer)

Trace: starting bmap() in fs.c

Trace: bmap() return the disk block address of the nth block in inode ip. If there is no such block, bmap allocates one.

Trace: bmap() arguments: ip (inode struct), uint bn (block number)

tfs\_write bytes: 39

Trace: starting fd\_to\_file() in tfsfile.c

Trace: fd\_to\_file() takes a file descriptor and creates a struct file.

Trace: fd\_to\_file() arguments: fd (file descriptor for file), file

jpeacemakr@MyPrecious:/mnt/c/Users/Bettina/Desktop/FileProject$ ./tiny read

manipulate fs file with reads.

fs : 3

Trace: starting bread() in bio.c

Trace: bread() reads from the file system to the buffer.

Trace: bread() arguments: block (uint block number being read), buf (buffer)

Trace: starting bread() in bio.c

Trace: bread() reads from the file system to the buffer.

Trace: bread() arguments: block (uint block number being read), buf (buffer)

Trace: starting bread() in bio.c

Trace: bread() reads from the file system to the buffer.

Trace: bread() arguments: block (uint block number being read), buf (buffer)

Trace: starting bread() in bio.c

Trace: bread() reads from the file system to the buffer.

Trace: bread() arguments: block (uint block number being read), buf (buffer)

Trace: starting bread() in bio.c

Trace: bread() reads from the file system to the buffer.

Trace: bread() arguments: block (uint block number being read), buf (buffer)

Trace: starting bread() in bio.c

Trace: bread() reads from the file system to the buffer.

Trace: bread() arguments: block (uint block number being read), buf (buffer)

Trace: starting bread() in bio.c

Trace: bread() reads from the file system to the buffer.

Trace: bread() arguments: block (uint block number being read), buf (buffer)

Trace: starting readi() in fs.c

Trace: readi() reads data from an inode.

Trace: readi() arguments: ip (inode struct), dst (string pointer), n (uint offset)

Trace: starting bmap() in fs.c

Trace: bmap() return the disk block address of the nth block in inode ip. If there is no such block, bmap allocates one.

Trace: bmap() arguments: ip (inode struct), uint bn (block number)

Trace: starting bread() in bio.c

Trace: bread() reads from the file system to the buffer.

Trace: bread() arguments: block (uint block number being read), buf (buffer)

fd5: 0

Trace: starting tfs\_read() in tfsfile.c

Trace: tfs\_read() reads from a buffer and loads it into a file.

Trace: tfs\_read() arguments: fd (file descriptor for file), p (buffer), n (length of buffer)

Trace: starting fd\_to\_file() in tfsfile.c

Trace: fd\_to\_file() takes a file descriptor and creates a struct file.

Trace: fd\_to\_file() arguments: fd (file descriptor for file), file

Trace: starting fileread() in file.c

Trace: fileread() reads a specified number of characters from a file.

Trace: fileread() arguments: file (file struct), addr (string pointer), int n (length of string)

Trace: starting readi() in fs.c

Trace: readi() reads data from an inode.

Trace: readi() arguments: ip (inode struct), dst (string pointer), n (uint offset)

Trace: starting bmap() in fs.c

Trace: bmap() return the disk block address of the nth block in inode ip. If there is no such block, bmap allocates one.

Trace: bmap() arguments: ip (inode struct), uint bn (block number)

Trace: starting bread() in bio.c

Trace: bread() reads from the file system to the buffer.

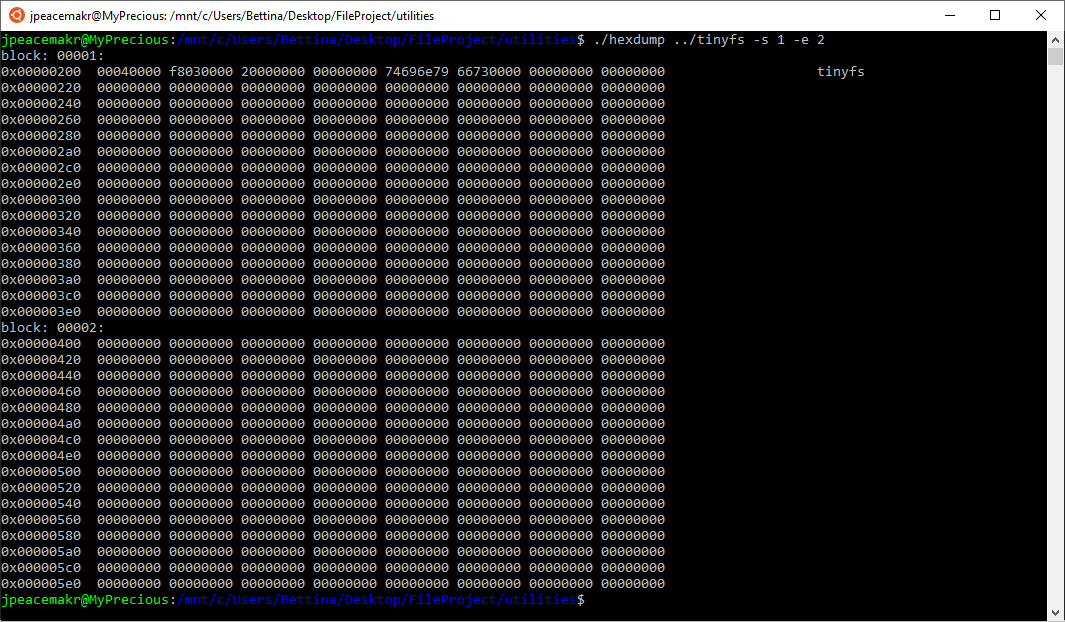
Trace: bread() arguments: block (uint block number being read), buf (buffer)

tfs\_read bytes: fd: 0, bytes read: 38 value read: This is just a test for the James file

jpeacemakr@MyPrecious:/mnt/c/Users/Bettina/Desktop/FileProject$

1. 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.

I created an e flag for the end block.



1. Submit your updated bio.c and hexdump.c files.

Advanced Submission (earn 2 points per test)

Update main in bio.c to test additional tfs\_ functions. You will first have to investigate the Linux equivalent to discover what it is supposed to do. Then you can try the tfs\_ version to see if it works. When something does not work, you will be forced into deep study of the underlying code base, which will sharpen your understanding of file system implementation. You can update bio.c with explicit test calls similar to the provided tests. A beautiful update of bio.c would include a shell-like interface that allows you to open, close, link, mkdir, etc. Select from (or do all) the following tests.

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.

jpeacemakr@MyPrecious:/mnt/c/Users/Bettina/Desktop/FileProject$ ./utilities/hexdump tinyfs -e 10

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

0x00000560 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

0x00000580 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

0x000005a0 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

0x000005c0 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

0x000005e0 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

block: 00003:

0x00000600 00070000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

0x00000620 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

0x00000640 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

0x00000660 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

0x00000680 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

0x000006a0 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

0x000006c0 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

0x000006e0 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

0x00000700 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

0x00000720 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

0x00000740 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

0x00000760 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

0x00000780 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

0x000007a0 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

0x000007c0 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

0x000007e0 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

block: 00004:

0x00000800 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

0x00000820 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

0x00000840 01000000 00000000 10000000 02000000 01000000 1c048760 00000000 08000000 `

0x00000860 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

0x00000880 02000000 01000000 22020000 01000000 02000000 2c048760 00000000 09000000 " , `

0x000008a0 0a000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

0x000008c0 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

0x000008e0 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

0x00000900 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

0x00000920 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

0x00000940 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

0x00000960 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

0x00000980 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

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

block: 00008:

0x00001000 02007465 73743800 00000000 00000000 00000000 00000000 00000000 00000000 test8

0x00001020 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

0x00001040 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

0x00001060 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

0x00001080 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

0x000010a0 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

0x000010c0 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

0x000010e0 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

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 54686973 20697320 6a757374 20612074 65737420 666f7220 74686520 4a616d65 This is just a test for the Jame

0x00001220 73206669 6c652031 2e0a5468 69732069 73206a75 73742061 20746573 7420666f s file 1. This is just a test fo

0x00001240 72207468 65204a61 6d657320 66696c65 20322e0a 54686973 20697320 6a757374 r the James file 2. This is just

0x00001260 20612074 65737420 666f7220 74686520 4a616d65 73206669 6c652033 2e0a5468 a test for the James file 3. Th

0x00001280 69732069 73206a75 73742061 20746573 7420666f 72207468 65204a61 6d657320 is is just a test for the James

0x000012a0 66696c65 20342e0a 54686973 20697320 6a757374 20612074 65737420 666f7220 file 4. This is just a test for

0x000012c0 74686520 4a616d65 73206669 6c652035 2e0a5468 69732069 73206a75 73742061 the James file 5. This is just a

0x000012e0 20746573 7420666f 72207468 65204a61 6d657320 66696c65 20362e0a 54686973 test for the James file 6. This

0x00001300 20697320 6a757374 20612074 65737420 666f7220 74686520 4a616d65 73206669 is just a test for the James fi

0x00001320 6c652037 2e0a5468 69732069 73206a75 73742061 20746573 7420666f 72207468 le 7. This is just a test for th

0x00001340 65204a61 6d657320 66696c65 20382e0a 54686973 20697320 6a757374 20612074 e James file 8. This is just a t

0x00001360 65737420 666f7220 74686520 4a616d65 73206669 6c652039 2e0a5468 69732069 est for the James file 9. This i

0x00001380 73206a75 73742061 20746573 7420666f 72207468 65204a61 6d657320 66696c65 s just a test for the James file

0x000013a0 2031302e 54686973 20697320 6a757374 20612074 65737420 666f7220 74686520 10.This is just a test for the

0x000013c0 4a616d65 73206669 6c652031 312e5468 69732069 73206a75 73742061 20746573 James file 11.This is just a tes

0x000013e0 7420666f 72207468 65204a61 6d657320 66696c65 2031322e 54686973 20697320 t for the James file 12.This is

block: 00010:

0x00001400 6a757374 20612074 65737420 666f7220 74686520 4a616d65 73206669 6c652031 just a test for the James file 1

0x00001420 332e0000 00000000 00000000 00000000 00000000 00000000 00000000 00000000 3.

0x00001440 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

0x00001460 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

0x00001480 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

0x000014a0 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

0x000014c0 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

0x000014e0 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

0x00001500 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

0x00001520 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

0x00001540 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

0x00001560 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

0x00001580 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

0x000015a0 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

0x000015c0 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

0x000015e0 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

jpeacemakr@MyPrecious:/mnt/c/Users/Bettina/Desktop/FileProject$

1. Repeat step 6a, but this time write to the file in steps. First write data that fits on a single data block. Then create another file with data. Then write more data to the first file to cause it to grow to two data blocks. This will show a file with two non consecutive data blocks. Copy/paste a hexdump of tinyfs showing your large file with data blocks separated.

jpeacemakr@MyPrecious:/mnt/c/Users/Bettina/Desktop/FileProject$ ./utilities/hexdump tinyfs -e 10

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

0x00000560 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

0x00000580 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

0x000005a0 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

0x000005c0 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

0x000005e0 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

block: 00003:

0x00000600 00070000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

0x00000620 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

0x00000640 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

0x00000660 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

0x00000680 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

0x000006a0 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

0x000006c0 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

0x000006e0 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

0x00000700 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

0x00000720 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

0x00000740 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

0x00000760 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

0x00000780 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

0x000007a0 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

0x000007c0 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

0x000007e0 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

block: 00004:

0x00000800 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

0x00000820 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

0x00000840 01000000 00000000 20000000 03000000 01000000 00098760 00000000 08000000 `

0x00000860 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

0x00000880 02000000 01000000 fc000000 ffffffff 02000000 04098760 00000000 09000000 `

0x000008a0 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

0x000008c0 02000000 01000000 26010000 ffffffff 03000000 04098760 00000000 0a000000 & `

0x000008e0 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

0x00000900 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

0x00000920 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

0x00000940 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

0x00000960 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

0x00000980 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

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

block: 00008:

0x00001000 02007465 73743941 00000000 00000000 03007465 73743942 00000000 00000000 test9A test9B

0x00001020 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

0x00001040 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

0x00001060 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

0x00001080 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

0x000010a0 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

0x000010c0 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

0x000010e0 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

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 54686973 20697320 6a757374 20612074 65737420 666f7220 74686520 4a616d65 This is just a test for the Jame

0x00001220 73206669 6c652031 2e0a5468 69732069 73206a75 73742061 20746573 7420666f s file 1. This is just a test fo

0x00001240 72207468 65204a61 6d657320 66696c65 20322e0a 54686973 20697320 6a757374 r the James file 2. This is just

0x00001260 20612074 65737420 666f7220 74686520 4a616d65 73206669 6c652033 2e0a5468 a test for the James file 3. Th

0x00001280 69732069 73206a75 73742061 20746573 7420666f 72207468 65204a61 6d657320 is is just a test for the James

0x000012a0 66696c65 20342e0a 54686973 20697320 6a757374 20612074 65737420 666f7220 file 4. This is just a test for

0x000012c0 74686520 4a616d65 73206669 6c652035 2e0a5468 69732069 73206a75 73742061 the James file 5. This is just a

0x000012e0 20746573 7420666f 72207468 65204a61 6d657320 66696c65 20362e0a 00000000 test for the James file 6.

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

block: 00010:

0x00001400 54686973 20697320 6a757374 20612074 65737420 666f7220 74686520 4a616d65 This is just a test for the Jame

0x00001420 73206669 6c652037 2e0a5468 69732069 73206a75 73742061 20746573 7420666f s file 7. This is just a test fo

0x00001440 72207468 65204a61 6d657320 66696c65 20382e0a 54686973 20697320 6a757374 r the James file 8. This is just

0x00001460 20612074 65737420 666f7220 74686520 4a616d65 73206669 6c652039 2e0a5468 a test for the James file 9. Th

0x00001480 69732069 73206a75 73742061 20746573 7420666f 72207468 65204a61 6d657320 is is just a test for the James

0x000014a0 66696c65 2031302e 54686973 20697320 6a757374 20612074 65737420 666f7220 file 10.This is just a test for

0x000014c0 74686520 4a616d65 73206669 6c652031 312e5468 69732069 73206a75 73742061 the James file 11.This is just a

0x000014e0 20746573 7420666f 72207468 65204a61 6d657320 66696c65 2031322e 54686973 test for the James file 12.This

0x00001500 20697320 6a757374 20612074 65737420 666f7220 74686520 4a616d65 73206669 is just a test for the James fi

0x00001520 6c652031 332e0000 00000000 00000000 00000000 00000000 00000000 00000000 le 13.

0x00001540 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

0x00001560 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

0x00001580 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

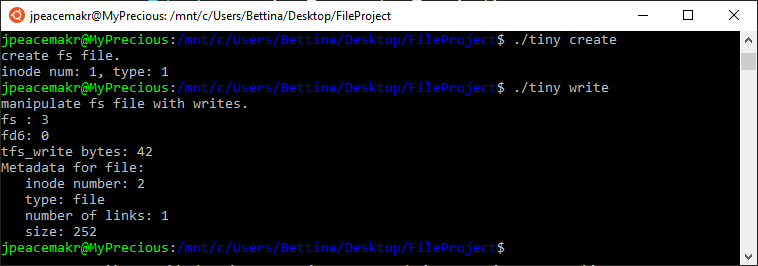
0x000015a0 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

0x000015c0 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

0x000015e0 00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000

jpeacemakr@MyPrecious:/mnt/c/Users/Bettina/Desktop/FileProject$

1. tfs\_fstat - equivalent to fstat. Copy/paste a log showing your tfs\_fstat test.



1. tfs\_link - equivalent to link. Copy/paste a log showing your tfs\_link test.
2. tfs\_unlink - equivalent to unlink. Copy/paste a log showing your tfs\_unlink test.
3. tfs\_mkdir - equivalent to mkdir. Copy/paste a log showing your tfs\_mkdir test.
4. tfs\_chdir - equivalent to chdir.  Copy/paste a log showing your tfs\_chdir test.
5. tfs\_lseek - equivalent to lseek.  Copy/paste a log showing your tfs\_lseek test.
6. Submit your updated bio.c file that includes your test cases.