Quiz - File System Implementation

Total points 45/45

Take the quiz solo, but feel free to consult a partner student, the book, the videos or other resources if needed. Re-take quiz if your score is less than 80% or if you just want some more practice.

The respondent's email (**faiyaz@pdx.edu**) was recorded on submission of this form.

✓ If we use a bitmap to keep track of a storage device's free blocks, then how large will the bitmap be?   *5/5

○ it depends on how much of the storage is utilized or free

◉ the bit map will have one element (one bit) per storage block   ✓

✓ If we have a 1TiB disk (2^40 bytes) and our storage block size is 512 bytes, and we use a bitmap to keep track of free blocks, then how much space do we need to reserve to store our bitmap? (assume no compression of the bitmap)   *5/5

○ 2^31 bytes

◉ 2^28 bytes   ✓

○ 2^40 bytes

○ 2^9 bytes

○ Other:

✓   What is one benefit of the contiguous allocation approach to tracking file   *5/5
    block locations?

⦿ Simple to implement   ✓

◯ Reduces external fragmentation

◯ Requires periodic compaction

◯ Performance is better for sequential reads for data stored on SSDs because data is
    stored sequentially

✓   Contiguous allocation is a reasonably good strategy for tracking file block *5/5
    locations for an archival storage device.

⦿ True   ✓

◯ False

File Allocation Table

Consider the following (small) file allocation table for a FAT filesystem. A "Cluster" is a
contiguous group of 4 512 byte blocks. The special value 0xffff indicates the terminating
block of a file.

Example File Allocation Table (FAT)

File Allocation Table (FAT)

Cluster	Next
2	0xffff
3	5
4	6
5	0xffff
6	7
7	2
8	3

✓ If file A begins at cluster 4 then what is the maximum number of blocks contained by file A?   *5/5

○ 4

○ 8

○ 12

◉ 16   ✓

○ 20

○ Other: _____

✓ if file A begins at cluster 4 and currently uses 50% of the space in its   *5/5
   terminating cluster then how large is file A?

○ 1792 bytes

◉ 7168 bytes   ✓

○ 2048 bytes

○ 8192 bytes

○ Other:

✓ If an inode has space for 10 disk block pointers (blocks are 512 bytes   *5/5
   each), then how large can a file be before Linux needs to use indirect
   inode pointers to keep track of the file

○ 1024 bytes

◉ 5120 bytes   ✓

○ 1 MB

○ 8196 bytes

○ Other:

Which of the following are commonly found in the header section of a Linux executable program *

	Yes, commonly found in an executable's header	Not often found found in an executable's header section	Score	
size and location of the program's text segment	●	○	1/1	✓
the (compiled) code of the program	○	●	1/1	✓
the size and location of the program's symbol table	●	○	1/1	✓
a magic number	●	○	1/1	✓
the address of the program's entry point	●	○	1/1	✓
size and address of the program's data segment	●	○	1/1	✓
the program's source code	○	●	1/1	✓
the program's data segment	○	●	1/1	✓
the linux user's manual	○	●	1/1	✓
the size and location of the program's BSS (block starting set, the region	●	○	1/1	✓

that defines
static data)

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