Assignment 7

Please complete a report and upload the corresponding codes.

The files should be uploaded directly without compression <mark>without compression without compression without compression</mark>

The files to be submitted for this assignment are:

1. report.pdf

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1. **[50pts]** Please read "Three Easy Pieces" Ch36 https://pages.cs.wisc.edu/~remzi/OSTEP/file-devices.pdf, and answer the following questions:

   (1) What are the pros and cons of polling and interrupt-based I/O?

   (2) What are the differences between PIO and DMA?

   (3) How to protect memory-mapped I/O and explicit I/O instructions from being abused by malicious user process?

2. **[50pts] Disk scheduling**

   Suppose the computer system uses the disk as the following:
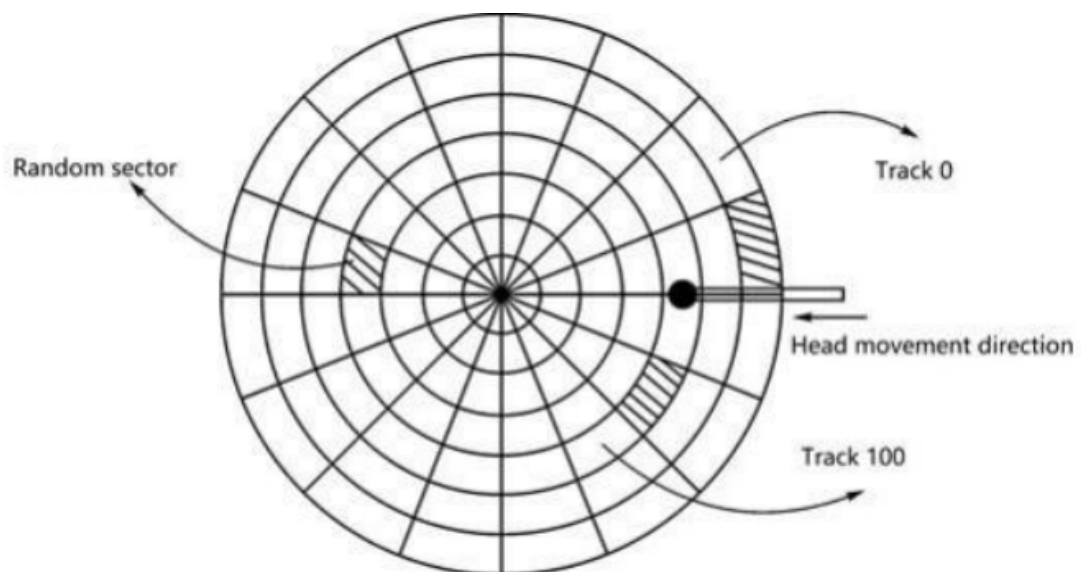
   The disk has 200 tracks in total. Let a single-sided disk rotation speed be 12000r/min, each track has 100 sectors, and the average movement time between adjacent tracks is 1 ms. If at some point, the head is located at track 100 and moves in the direction in which the track number increases, the track number request queue is 70, 20, 90, 110, 60, 20. A randomly distributed sector is read for each track in the request queue.

   (1) READ/WRITE data time = (1)_____+ (2)_____+ (3)_____.

   (2) Use FIFO\SSTF\SCAN\CSCAN algorithm to read the six sectors:

      a) write the track access sequence

b) how much time is required in total? The calculation process is required.