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Lab 4

T1

Average time to retrieve data from any track in the disk and store it into the Disk buffer

* In the worst case, it will take 101 millisecond to retrieve data from any track. In the best case, it will take 1 millisecond.
* This is because in the best case, the read/write head is already where it needs to be, so we would just multiply the 100 sectors by the 0.1 milliseconds for 1.
* In the worst case, it has to traverse the 100 sectors, so it would be 101 milliseconds.
* The average of these is 51 milliseconds.

T2

Time to transfer the data from the Disk’s buffer memory to Main Memory

* The display unit has 204800 pixels, or bytes, which is 6400 blocks.
* The transfer time is 32000000 bytes/s, or 1000000 blocks/s
* Dividing the number of blocks that need to be transferred by the transfer rate gives us 0.0064 seconds, or 6.4 milliseconds
* 6.4 milliseconds

T3

The transfer rate from Main Memory to the GPU’s buffer/refresh memory is the exact same as from the Disk’s buffer memory to Main Memory, so this time is the same as T2.

* 6.4 milliseconds

Adding these 3 components of the average time up, we get

63.8 milliseconds

for the total average time that will take to retrieve/transfer one complete video frame from its storage location on the Disk Drive to the GPU’s buffer/refresh memory.