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Database Systems
Homework 3

13.2.1
c) The maximum seek time = 1 + 0.0002(99,999) = **21 ms**. The maximum seek time is the time it takes for the head to move over all n tracks, and n in this case is 100,000.

e) Percent of gap covered * How many gaps + Sector covers + how many sectors = 0.072 deg * 63 gaps+ 0.288 deg * 64 sectors= 23 deg.
One rotation in 6 ms, because a disk rotates at 10,000rpm (see #4), so one degree in 1/60 ms.
23/60 = **0.38333 ms.**

13.3.1
a) Elevator algorithm:

32,000 to 8000
T = 7 + 4.3 = 11.3
8000 to 4000
T = 11.3 + 2 + 4.3 = 17.6
4000 to 40,000
T = 17.6 + 11 + 4.3 = 32.9
40,000 TO 43,000
T = 32.9 + 3 + 4.3 = 40.2

14.1.1
a) Dense index: Data file needs n/3 blocks, dense index needs one key pointer pair per record, so n/10 blocks. So, n/10 + n/3 = 13n/30

b) Sparse index: Still n/3 blocks, but with a sparse index you need one key pointer pair per data block, so n/30 blocks. So, n/30 + n/3 = 11n/30