L3 - Indexing problem

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1) Number of records = 300,000
Length of each record = 100 bytes
Size of block = 4096 bytes

Records / block = 4096/100 = 40

∴ No of blocks = 300,000/40 = 7500

Length of ordering key = 9 bytes

Length of address of blocks = 6 bytes

Total length of address of index file = 9+6 = 15 bytes

Binary search through all the blocks without indexing will take = $\log_2 7500 \simeq 13$ access

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By considering indexing, the size of search space can be reduced to 4096/15 = 273

Binary search will consume $\log_2 273 \simeq 9$

∴ Data retrieval will finally take 9+1 = 10 access