

In example 11.7, it is given that R consists of 10,000,000 tuples. And it is assumed that 100 records fit in one block.

Thus R occupies 100,000 blocks.

In the first phase of TPMMS, there are 100,000 inputs and 100,000 output (read and writes) access into disc.

We calculated that for each I/O between disc and main memory, it takes 7.5238 ms.

\Rightarrow 200,000 I/O operations take $200,000 \times 7.5238$ ms.

In the second phase also, each block is brought into main memory only once. So it takes another 200,000 I/O operations.

$$\begin{aligned}\text{So total time taken} &= 2 \times 200,000 \times 7.5238 \text{ ms} \\ &= 30.0952 \times 10^2 \text{ s} \\ &= 3009.52 \text{ s} \\ &\approx 50.16 \text{ min}\end{aligned}$$

(Time taken for sorting is almost negligible compared to this time).