

Solution

NDBI007: Practical class 1



Exercise 1.1 (Solution)

 $MTR = \frac{TC}{2 \bullet r}$

 $TC = \frac{448}{8} \bullet 0.00417 \bullet 2$

TC = 0.46 MB

* Note that transfer speed on outer edge is maximal, hence the result is the upper bound

 $TC = MTR \bullet 2 \bullet r$



Exercise 1.2 (Solution)

 $SDR = \frac{1}{2 \cdot r \cdot data_heads + (data_heads - 1) \cdot head_switch_time + track_to_track_time}$

data_heads • TC

 $TC = \frac{SDR \cdot (2 \cdot r \cdot data_heads + (data_heads - 1) \cdot head_switch_time + track_to_track_time)}{SDR \cdot (2 \cdot r \cdot data_heads + (data_heads - 1) \cdot head_switch_time + track_to_track_time)}$ data_heads

$TC = \frac{37 \cdot (2 \cdot 0.00417 \cdot 10 + (10 - 1) \cdot 0.001 + 0.0012)}{10}$ 10

TC = 0.35 MB





Exercise 1.4 (Solution)

$$btt = \frac{2 \cdot r}{TC} \cdot block_size$$

$$btt = \frac{2 \cdot 0.00417}{0.46} \cdot 0.004$$

btt = 0.072 ms



 $read_time = BC \bullet (s + r + btt)$

 $read_time = 250,000 \bullet (8.5 + 4.17 + 0.111)$

read_time \approx 3,195 *s* \approx 53 *m*

Note that btt is marginal compared to seek time, hence the reading and the writing is most affected by the movement of read-write head *

$$btt = \frac{block_size}{MTR}$$

$$btt = \frac{0.004}{0.004}$$

$$btt = \frac{1}{448 \div 8}$$

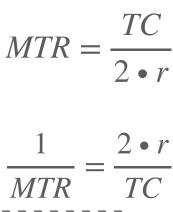
btt = 0.072 ms

0.30 MB 0.35 MB 0.46 MB 0.119 ms 0.111 ms 0.095 ms 0.072 ms

 $read_time = BC \bullet (s + r + btt)$

 $read_time = 250,000 \bullet (8.5 + 4.17 + 0.072)$

read time $\approx 3,186 \ s \approx 53 \ m$



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