

# 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 \*

$$btt = \frac{block\_size}{MTR}$$

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

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

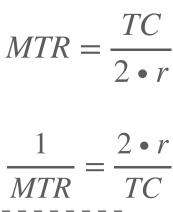
btt = 0.072 ms

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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