

Scientific Computing - Exercise Sheet 2

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19.04.2021

1 Exercise

(a)

$$\begin{aligned} t_{total}^\nu &= 10^{-2} \cdot 10^5 h + (1 - 10^{-2}) \cdot 10^5 h \cdot 10^{-k} \\ &= 1000h + 0.99 \cdot 10^{5-k} h \end{aligned}$$

k	t_{total}^ν
1	10900h
2	1990h
3	1099h
4	1009.9h
5	1000.99h

(b) $S_p = \frac{t_1^N}{t_p^N} = 10^k$

$$E_p = \frac{t_1^N}{p t_p^N} = 1$$

(c) $t_{total}^\nu = \nu t_1^N + (1 - \nu) t_p^N = t_s^N + (1 - \nu) \frac{t_1^N}{p} \xrightarrow[p \rightarrow \infty]{} t_s^N$

(d) $S_p^c = \frac{t_1^N}{t_p^N + t_c} = \frac{t_1^N}{\frac{t_1^N}{10^k} + 10^{k-1}} \xrightarrow[k \rightarrow \infty]{} 0$