

Known misprints Numerical Algorithms and Digital Representation

The Author

Below is a list of known misprints in the version that is published on the webpages for the course MAT-INF1100. An updated version where the misprints have been corrected can be found on the same pages.

The misprints are identified by page number and line number, unless stated otherwise. A negative line number means it is counted from the bottom of the page.

v, 1: 'form' should be 'from'.

34, -9: 1×16^1 should be 1×16^0 .

37, -3: 'integral' should be 'integer'.

39, -7: b_{16} should be d_{16} .

40, 2: The first '1' in table 3.1 should be '0'.

46, -6: $a_{16} = 1100_2$ should be $a_{16} = 1010_2$.

46, -4: The two occurrences of the bit patterns 1100 should be 1010.

63, 11: 10^{-2} should be 10^0 .

95, -2, -3, -6: The number (159.3, 0.1593×10^3 and 0.15930963×10^3 in these lines should be negative.

97, -1: $\sqrt{x^2 - 1}$ should be $\sqrt{x^2 + 1}$.

99, -18: In exercise 5.5 the test in the **while**-loop should be $x \leq 2.0$, and not $i \leq 2.0$.

106, 9: 'If' should be 'In'.

108, 3: The motivation for the difference equation in example 6.2 is wrong. The new text should be:

An illness is spreading by direct contact between individuals. Each day a person with the illness infects one new person, and the infected person becomes ill after three days. This means that on day n , the total number of ill persons are the people who were ill yesterday,

plus the number of people who were infected three days ago. But this latter number equals the number of people that were ill three days ago. If x_n denotes the number of ill people on day n , we therefore have

$$x_n = x_{n-1} + x_{n-3}, \quad n = 3, 4, \dots,$$

or

$$x_{n+3} = x_{n+2} + x_n, \quad n = 0, 1, \dots$$

We obtain a difference equation of order k if we assume that the incubation time is k days. By reasoning in the same way we then find

$$x_{n+k} = x_{n+k-1} + x_n, \quad n = 0, 1, \dots \quad (1)$$

Note that in the case $k = 2$ we get the famous Fibonacci model.

109, -3: 'The' after 'that' should be removed.

110, 16: The argument to the functions g , f_0 , and f_1 should ' $i - 2$ ', not ' i '.

112, -12: 'theme' should be 'them'.

113, 12: Corollary 6.9 should be reformulated as

Corollary 6.9. For $n \geq 0$, the solution of the difference equation $x_{n+1} = bx_n$ will behave according to one of the following three cases:

$$\lim_{n \rightarrow \infty} |x_n| = \begin{cases} 0, & \text{if } |b| < 1; \\ \infty, & \text{if } |b| > 1; \\ |x_0|, & \text{if } |b| = 1. \end{cases}$$

126, 9: First 'they' should be 'the'.

126, 11: 'unavailable' should be 'unavoidable'.

127, 12: The difference equation should be

$$x_{n+2} - \frac{2}{5}x_{n+1} + \frac{1}{45}x_n = 0.$$

188, 1: ' n distinct real numbers' should be ' $n + 1$ distinct real numbers'.

190, -10: 'fist' should be 'first'.

110, -14: 'iterations' should be 'numbers'

224, 18: In exercise 10.2 the equation should be $(x - 10/3)^5 = 0$.

216: In Algorithm 10.13, the variable i must be increased by 1 ($i := i + 1$) inside the while loop.

218, -8: 'tangent' should be 'secant'.

221, -10: There is a missing ')' in the expression $f(x_n$.

223: The second sentence in the Summary should be 'The Bisection method is robust and works for almost any kind of equations and even for a zero c where $f(c) = f'(c) = 0$, but the convergence is relatively slow.'

229, -3: The first $f(a)$ should be $f'(a)$.

233, -4: 'approximately' should be 'approximatively'.

235, -5: 'derivaton' should be 'derivation'.

242: The last sentence before section 11.4.1 should be 'To save space we have only included one highlighted box, where both the approximation method and the total error are given.'

246, 4: The sentence should be 'From this we obtain an expression for the truncation error.'

254: In the second sentence in Lemma 11.27 there is an extra 'the'.

259: The formula at the end of the first sentence in observation 11.30 should be $[a, b]$.

260: The formula at the end of the first sentence in lemma 11.31 should be $[a, b]$.

260: In the second sentence in lemma 11.31 there is an extra 'the'.

266, -1, -3: In both formulas, there is a missing ')' in the first function value on the right.

267, -3: The beginning of the first sentence should be 'In this chapter we have derived three methods ...'.

319, 8: Exercise 1 has been changed to
Suppose we have the differential equation

$$x'(t) = f(t, x), \quad x(b) = x_0,$$

and we seek a solution on the interval $[a, b]$ where $a < b$. Adjust Euler's method so that it works in this alternative setting where the initial value is at the right end of the interval.