

## Cut &amp; paste sample codes into Matlab's prompt

Please notice that cut & paste of sample Matlab command lines from the PDF version of the book may lead to errors if certain characters (such as ' or ^) are not properly copied into Matlab's prompt. I will provide the codes appearing in the book in my personal website as soon as possible, but these will not include the greyed boxed sample command lines that appear in the book to illustrate examples.

## ERRATA (August 2022)

1. On page 23, in part (d) of Practical 1.2, it reads: "Find the minimum initial angle  $\theta_{\min}$  ...". It should read: "With the same initial speed, find the minimum initial angle  $\theta_{\min}$  ...".
2. On page 32, equation (2.6), replace last terms  $\cdots(x_3 - x_2)(x_2 - x_1)$  by  $\cdots(x_2 - x_1)(x_2 - x_0)(x_1 - x_0)$ .
3. On page 38, last comment in Code 3, replace **Practical 3** by **Practical 2.1**
4. On page 71, gray box (top of the page), it reads: `D = diffmat(x),`  
The last character (',') appearing at the end should be removed from Matlab's prompt (here plays the role of a comma within the text).
5. On page 71, gray box (bottom page), it reads: `D = diffmat(x)+`  
The last character, +, appearing in Matlab's prompt should also be removed.
6. On page 96, 2nd paragraph, before equation (4.31), replace " ... **2m subintervals** ..." by " ... **m subintervals** ...".
7. On page 116, equation (4.87), the integral should be multiplied by  $2L$ .
8. On page 197, equation (5.241), replace **v** by **b**.
9. On page 201, comment in Code 18, replace **See (5.255)** by **See (5.257)**.
10. On page 229, Figure 6.6 (b) is obtained starting from the points indicated in (6.49) and (6.50), but the step factor **s** must be updated after calling `conststep` function, that is:

```
[y,iconv] = conststep(@fun,y0,y1,s,tol,itmax); s = s*norm(y1-y0)/norm(y-y1);
```

The justification for this updating is not commented in the text, but it will be explained in future editions.

11. On page 244, 1st paragraph, replace  $f(t_N) = f(t_0)$  by  $f(t_N) = f(0)$ .
12. On page 251, paragraph before equation (7.72), replace  $F'_N(s)$  by  $F'_N(x)$ .
13. On page 291, gray box, second line should read: `b = (j.^j')\((s.^k-(s-1).^k)./k) ; b'`
14. On page 297, Practical 8.2, the force between  $m_i$  and  $m_j$  reads

$$\mathbf{F}_{ij} = \frac{m_i m_j}{|\mathbf{r}_i - \mathbf{r}_j|^3} (\mathbf{r}_i - \mathbf{r}_j),$$

but it should read

$$\mathbf{F}_{ij} = \frac{m_i m_j}{\|\mathbf{r}_i - \mathbf{r}_j\|^3} (\mathbf{r}_i - \mathbf{r}_j).$$

15. Also, on page 297, Practical 8.2, part (a), it reads  $\varepsilon(h) = |\mathbf{r}_h(2) - \mathbf{r}_{\text{ex}}(2)|$ , but it should obviously read  $\varepsilon(h) = \|\mathbf{r}_h(2) - \mathbf{r}_{\text{ex}}(2)\|$ . Similarly in part (b),  $|\mathbf{v}_0| = \sqrt{2}$ , should actually read  $\|\mathbf{v}_0\| = \sqrt{2}$ .
16. On page 308, equation (8.179) reads:

$$v_{n+2} - \left(1 + \frac{3}{2}h\lambda\right) v_{n+1} - \frac{1}{2}h\lambda v_n.$$

On page 308, equation (8.179) reads:

$$v_{n+2} - \left(1 + \frac{3}{2}h\lambda\right) v_{n+1} + \frac{1}{2}h\lambda v_n.$$

17. On page 321, first paragraph (5th line) and also in caption of Figure 8.18, it reads  $a = 40$ , but it should read  $a = 10$ .
18. Second paragraph of page 261 starts with: "In this chapter ... ", but it should read: "This chapter ...".
19. On page 327, Practical 8.3, equation (8.254) reads

$$\frac{df_j}{dt} = \sum_{\ell=0}^{N-1} \mathbf{D}_{j\ell}^{(2)} f_\ell(t) + f_j(t) \sum_{\ell=0}^{N-1} \mathbf{D}_{j\ell}^{(1)} f_\ell(t),$$

but it should read

$$\frac{df_j}{dt} = \alpha \sum_{\ell=0}^{N-1} \mathbf{D}_{j\ell}^{(2)} f_\ell(t) + f_j(t) \sum_{\ell=0}^{N-1} \mathbf{D}_{j\ell}^{(1)} f_\ell(t).$$

20. On page 327 as well, Practical 8.3, after equation (8.254), it reads: "... take  $\alpha = 10^{-1}$ , ...", but it should read "... take  $\alpha = 10^{-2}$ , ...".

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Please kindly send your comments and errata to my e-mail address [alvaro.meseguer@upc.edu](mailto:alvaro.meseguer@upc.edu). I will keep updating this document on a regular basis. Thank you very much.