

Corrections and emendations for
A Practical Guide to Splines
 by Carl de Boor

Each emendation is preceded by an ‘e’.

Each correction is preceded by zero or more dots to indicate in which printing this error can still be found. Often, only the correct version is given, with the corrected part underlined.

The starred items still await actions by the publisher.

Locations are identified by $a/b/c$, meaning **page** a / **paragraph** or **item** b / **line** c , with a negative b or c meaning a count from the bottom (of the page or the specified paragraph).

For example, ix/-3/-1 = ix/3/2 ends in ‘text’.

*xv//4: THE SUBSCRIPT x SHOULD BE BOLDFACE

xvii//2: polynomial

xx//6: Cubic Spline Interpolation

3//3: by M/D a

3//5: REPLACE $(2n-3)M$ BY $(n-2)M + (n-1)D$

3/1/-5: REPLACE $2nM$ BY $nM + nD$

6//1: the secant (6) goes over

8/(viii)/: if $\tau_{\underline{i}} = \dots = \tau_{i+k}$

10//1 /r!

11/1/-1: REPLACE M BY D

13/2/5: REPLACE $]_n$ BY a_n

18/-1/3: DELETE $0 \leq$

18//1: REPLACE LARGE PARENS AROUND ARGUMENT FOR $T_{n-1}^{(i)}$ BY SMALL PARENS

21//3: $(n - \underline{i})!$

21/5./1: $(-1)^{n-1}$

21/6./1 p(x) =

21/6./-1: than n $\|\delta a\|/\|a\|$

21//4: CCOEF = (a,b,

22/heading/: Polynomial

25/2/13: (max $_i |g(\tau_i)|$)

26/Theorem/-1: l n

*27/Figure II.2/: THE DASHED LINE IS INCORRECT FOR SMALL n . IT SHOULD CURVE UP AND MEET THE SOLID LINE AT $n = 1$.

27//2: at line 15 to read

28//2: FLOAT(NM1)

28/2/1: SHOULD BEGIN (with MAX.ERROR an estimate on $[\tau_1, \tau_n]$ only. this is ...

28/-1/3: line 5 to

32// -1: $|x|^\alpha$ on $[-1, 1]$

34// 1: $[-1, 1]$

34// -5: order kn

36/2./ -2: SHOULD READ (τ_1, σ_i) ,

36/2./ -1: INSERT $)$ BEFORE $.$

36/3./ -6: $:= \cos((2i - 1)$

36/3.-3: SHOULD READ $\langle T_i, T_i \rangle = n/2 \dots, \langle T_0, T_0 \rangle = n.$

37/(b)/9: SHOULD READ $\alpha_1 = (\sum_j$

37/(b)/-1: SHOULD READ $= \underline{2}(\$

38/4./ -1: SHOULD READ \geq

40/-2/-4,-5: SUBSCRIPT 1 SHOULD BE SUBSCRIPT i (TWICE)

41/(6)/1: SHOULD READ $\tau_{i-1} < x \leq \tau_i$

43//6: SHOULD READ $\Delta\tau_0 = \Delta\tau_n = 0$

44//14 INSERT A SPACE BETWEEN dx AND \max .

:50// -6: a τ is missing

..53/2/-3: REPLACE in case τ is not uniform, since then BY since

53//4: see problem 3(e).

..57/CUBSPL/230: DELETE INTERVAL

.59/2./4: for given $h \neq 0$, with

60/(c)/2,3: DELETE , but $O(|\underline{\tau}|^4)$ in case $\underline{\tau}$ is uniform

*60/(c)/3: END WITH PERIOD.

:61/7.(a)/3: DELETE 3

:61/7.(b)/3: REPLACE 4 BY 3.75

:62//1: SHOULD READ $-(I_4 g)' \| \leq \underline{4.75} \dots \dots \dots C^{(1)}$

*62/table in 9./: SHOULD READ

$$\frac{\| 35}{\| 47,635}$$

.62// -6: $[N(\tau_{i+1}) - N(\tau_i)]/5$

62// -4: L.I. Boneva

*63/title/: Cubic Spline

64/heading/: SHOULD READ V.

64/(1)/: $\underline{\S}_2$

66// -1: EXPONENT IN DENOMINATOR SHOULD BE $5/2$, NOT $3/2$.

67/-1/4: SHOULD READ \sum_1^n

:70/(*)/: SHOULD BEGIN $2F_I(0) + \dots$

:70/3./2: SHOULD READ $F_I(x) = \dots$

70//2: or (12) with
 :77(9)/: SHOULD READ $(s_{i+1}^- - s_i^+)/\Delta\xi_i$
 77//1: SHOULD READ $2, \dots, n,$
 :78/1/-4: SHOULD READ strictly column diagonally dominant
 *e78/1/-4ff: NEEDS REFERENCES (E.G., TO WILKINSON)
 79//3: EXPONENT SHOULD BE n , NOT $n + 1$
 80/1.(b)/1: linear system in (a)
 :80//2: CHANGE $v_i(\xi_{i+1} - x)$ TO $v_i(x - \xi_{i+1})$
 80//2: INSERT $(v_i$ AFTER $2(x - \tau_i)$
 81/2.(b)/1: SHOULD READ $\xi_{i+1} =$
 81/2.(b)/2: SHOULD READ $\xi_{n+1} = \tau_n$
 *.82(c)/3: SHOULD READ else in $[0, 1[$.
 *.83/5.: ALL d_0 SHOULD READ d_1 . All d_{n+1} SHOULD READ d_n
 .83/5(b)/2: SHOULD READ of Problem 3.)
 :83/5./4: SHOULD READ $:= d_{\underline{0}}(n + 1 - x)$
 85/title/: Polynomial
 90/first display in para./: SHOULD READ $\xi_i \leq x < \xi_{i+1}$
 * e92/program/: As presently written, it takes four comparisons to ascertain that one is, once again, in the last interval. To correct this: in line 440: REPLACE IHI BY IL0 // line 490 SHOULD READ : GO TO 21 // line 510 should be given the statement number: 21
 106/1./2: SHOULD READ of Chapter V,
 111/2/-2: SHOULD READ \sum_1^5
 113//1: Definition_
 120/2/3: may have as few
 126/2./1: SHOULD READ $B_{\underline{0},k},$
 :128(b)/2: SHOULD READ $\leq \underline{4}$ dist $(g, \$)$
 131//3: SHOULD READ $t_{j+k-1} < x$
 .134//180: REPLACE BVALUE BY BSPLPP
 136/program/300/: EVALUATION
 140/program/240: OF SIZE (K, \underline{L})
 141/program/: It is possible to avoid the multiplication by FKMJ in the innermost loop (the DO 20) by carrying out the required multiplication outside that loop, for example at the end by inserting after line 1010 the following:

```

      IF (K .EQ. 1)                RETURN
      FACTOR = 1.
      DO 60 I=2,K
          FACTOR = FACTOR*FLOAT(K+1-I)
  
```

```

DO 60 J=1,LSOFAR
60      COEF(I, J) = COEF(I, J)*FACTOR

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Also, delete line 660, remove that multiply from line 700, and REPLACE FKMJ in line 400 BY FACTOR

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142//4: ... , BREAK(L + 1)

142//3: SHOULD READ $B_{LEFT-k+j+r}$

142//1: (T , k - j , 1

.142//1: DON'T DISPLAY IT. ALSO, ADD AFTER IT A final change of variables, in which $k - j - 1$ is substituted for j , leads from this to the DO-30 loop.

143//4: BSPLVB

143/program/160: REPLACE *.2 BY /5.

.:144/BVALUE/300: REPLACE $\emptyset R$ BY OR

146//3: TWICE, CAPITALIZE k .

2nd 147//4, 148//3, 148/1/4: SHOULD READ (17b)

148/2/1: SUBSCRIPT SHOULD READ $i - k + j$

.151//1: $\sum_1^n \alpha_j$

151//5: $B_{i,k}(y) dy =$
3rd e152/5./: SHOULD REFER TO M.COX
3rd 152/7./: SHOULD READ $7 \in (t_i, t_{i+k})$ (ELSE, mention result in
152/8(b)/-1: SHOULD READ $k + 1$ INSTEAD OF $k - 1$
.152//1: for how many interpolation points is it ...
.152//-1: SHOULD READ $\Delta^j \alpha_{r-k+1}$
.157/Corollary/: ADD AFTER IT THE ONE-SENTENCE PARAGRAPH In particular, a B-spline of order
 > 1 is unimodal.
163//1: SHOULD READ IX.8
163/4(ii)/2: REPLACE parabolic BY cubic
.167/(3)/: SHOULD READ $2\omega(g; \min \{ \frac{b-a}{\sqrt{2k-2}},$
*e175/(13a)/: K should depend on μ_i
179//5: in (10), we
184/1/-3: REPLACE $\xi_{i+1/2}$ BY $(\xi_{i-1} + 3\xi_i + 3\xi_{i+1} + \xi_{i+2})/8$
*e186/2/-1: REPLACE not smooth BY not uniform
:188//3-2: REPLACE was interpreted by ... small near BY makes h of (25) vanish between the
first and the second (and between the second last and the last) data points. Therefore NEWNOT puts all
breakpoints well away from
.:189/Thm XII.5/3: AFTER $[a, b]$ ADD near which $|D^k g|$ is monotone
.197/5./-4: SHOULD READ $]\tau_{i-3}, \tau_{i+3}[$
:198//end: ADD
9. Modify CUBSPL to treat the not-a-knot end condition in the alternative way outlined on p.56, i.e., without
ever making the second and the second last data points breakpoints. Then repeat the calculations of Example
XII.2 with this modified CUBSPL.
200/theorem XIII.1/: SHOULD BEGIN WITH
Let $\underline{\tau}$ be strictly increasing and such that $t_i = \dots = t_{i+r} = \tau_j$ implies $r < k$. Then the matrix ...
200/3/: DELETE ENTIRE SENTENCE (IT'S OBIATED BY CORRECTION IN THEOREM).
.200//-1: ~~! ! ! ! !~~ few
204/program/300: SHOULD READ $\underline{T}(I + K)$
207/program BANSLV/80: OF ORDER
.209//3: 383.4; also 210//5
210//4: $\text{dist}(g, \mathcal{S}_{4, \underline{\tau}})$
211/Theorem/-1: $\text{dist}(g^{(m)}, \mathcal{S}_{m, \underline{\tau}}) | \underline{\tau}|^m$
214/2/-2: ≤ 1.7 ... regardless
219/program/290: IFLAG
222/Example/4: = 585 +
224/figure/: mark the 12 points interpolated.

225//2: i.e. SHOULD BE IN ITALIC

:229/(11)/: LEAVE EXACTLY AS IS

230//10: $\underline{D^m e}$

231//3: $D^{k-1}G$

.233/3./-4: SHOULD READ $]t_j, t_{j+k-1}[\cap]\tau_i, \tau_{i+1}[$

*234/7./-1: SHOULD READ $\lambda_h g$

235/2/4: of the standard deviation in y_i

3rd 239//1: SHOULD READ positive (semi-)definite

240/program/480: REPLACE A GOOD BY TAKEN AS AN

*241/800/: insert line 805 to read GO TO 50

*241/930/: give it statement number 50

240-242//: As C. Reinsch has pointed out, the program `smooth` is deficient in various respects. See the better version now in the `netlib` package `pppack` (which contains (updated versions of) all the programs from this book).

252/2/4: choosing

:256//120: FOR _I-J_ .GE. NBRANDS

.257//580: DELETE , X

259//450: REPLACE 2HON BY ·ON·

259//730: SHOULD READ $NT = \underline{0}$

263//2: occuring

263//2: occuring

.264//2: 0 0

*264//2: 0 0

266/program/170: SHOULD READ $= \underline{(I-1)}$ *STEP

269/2/5: is only 20.

270/figure XIV.4 title/2: fifteen interior knots

.273/(i)/: SHOULD READ if and only if $D^m f \in \mathcal{S}_{m, \underline{x}}$ (note that \underline{x} is strictly increasing).

.:273/(ii)/1: $N \geq m$

*e274/2./: THE HINT SHOULD READ Set $F_p(f) := pS(f) + (1-p)T(f)$, $T(f) := \int (f^{(m)}(x))^2 dx$. Use $F_p(f_p) \leq F_p(f_q)$ and symmetry in p, q to show that $H(p)[S(f_p) - S(f_q)] \leq T(f_q) - T(f_p) \leq H(q)[S(f_p) - S(f_q)]$ with $H(p) := p/(1-p)$. Conclude that $S(f_p) \leq S(f_q)$ for $q < p$ with equality iff $F_p(f_p) = F_p(f_q)$, hence $f_p = f_q$ (since f_p is the unique minimum for F_p). Then use the linearity in p of the equation for f_p to conclude that $f_p = f_q$ for all q in case $f_p = f_q$ for some $q \neq p$.

275/7./4: C^1 -quartics

:281/2/-3: ... one might as well forget about it ...

282/-1/2: REPLACE between BY among

286//330: should end WITH LOWROW= 1+

288/program/300: $I = \underline{1}$, ...

289//1030: the label 30 is not needed

291//970,1030: move 1030 up to the position between 960 and 970, then give it the statement number 30 (from 970). (In the present arrangement, printout of breakpoints might be incorrect (or impossible in a linear problem).)

*291//970,1030 move 1030 up to the position between 960 and 970, then give it the statement number 30 (from 970). (In the present arrangement, printout of breakpoints might be incorrect (or impossible in a linear problem).)

316/example/2: $f(x) = \underline{(x - .3)^2}$

:316/example/3: $c_y(s) = \underline{f(s)}$

.321/2/3: v_1 SHOULD NOT BE BOLDFACE

.:324/(ii)/2,5,-2: Toeplitz; ALSO 325//5,8

*e324/(ii)/2,5,-2: Toeplitz; ALSO 325//5,8; ALSO 391//

328//2: SUMMATION SHOULD RUN OVER $|j| < k/2$

331/6./1: $Q_k(x + \frac{k}{2})$

.:335/2/2: $m \geq n$

.:335/2/6: $m \leq n$

341//2: SHOULD READ NX, KX, A

350/2/3: we are led into

:360/2/-2: ... Winther [1979]

.:368//386: add ,SUM

.:368//392: REPLACE AMIN \emptyset BY MIN \emptyset

.:377/D.L. Barrow/: REPLACE to appear BY Quart.Appl.Math.36 (1978), 293–304

:378/de Boor [1979]/: REPLACE , to appear BY 5, 173–182

.:378/de Boor [1980]/: REPLACE , to appear BY manuscript

:379/Brutman/: REPLACE , to appear, BY 15, 694–704;

.379//3,-2: DELETE in one and two dimensional spaces

:380/Conte [1980]/: DELETE to appear

383//7: T. Lyche and R. Winther_

:383//8: [1979]

:383//9: REPLACE , to appear BY 25, 266–279

.:389/Hermite interpolation/: 51

389/Fortran/: xv-xvii

.:390/modulus of continuity/: xy

390/noise/: ADD ,275-6

.:391//: SHOULD READ Toeplitz