

ERRORS IN HACKER'S DELIGHT

Second Edition, First Printing

P. 1, 5th line up from bottom: the two formulas $x = y = -2^{31}$ and $x = y = -2^{32}$ should have light-face type (as I show here).

—Mike Collins

P. 12 line 9: “and 0’s elsewhere” should be “and 1’s elsewhere”.

—Soonbaek Yun

P. 37, Delete the last sentence in the second paragraph (“These remarks remain true if there is a “carry in”—that is, if we are computing $x + y + 1$.”).

—Jasper Neumann

P. 45 line 5: Add a few words so that it reads “if y is the maximum negative number and x is not.”

—Lawrence Ryan

P. 47 line 12: “... 11 instructions and six cycles” should be “... 11 instructions and five cycles” (i.e., change “six” to “five”).

—Lawrence Ryan

P. 50, 7th line up from the bottom: This long formula needs more parentheses. It should be:

$$f(x) = (((x \ll (31 - n_1)) \ggg 31) \& (a - b)) + (((x \ll (31 - n_2)) \ggg 31) \& (c - a)) + b$$

—Lawrence Ryan

P. 62 line 19: “loops forever for $x \geq 2^{31}$ ” should be “... $x > 2^{31}$.”

—Lawrence Ryan

P. 74 line 3: “first two inequalities” should be “first three inequalities”.

—Lawrence Ryan

P. 74 line 19: “valid and it reduces” should be “valid and it may reduce”.

—Lawrence Ryan

P. 75 lines 5 and 8 of the paragraph that starts “Now let us consider”: The expressions $c \mid d$ should both be $b \mid d$.

—Lawrence Ryan

P. 88, add to the end of the first paragraph: “The third executable line must be changed to $x = (x \& 0x0F0F0F0F) + ((x \gg 4) \& 0x0F0F0F0F);$ and the 3F in the last line must be changed to 7F.”

—Lawrence Ryan

P. 88, second line of last paragraph, change “larger population count” to “larger (or same) population count”.

—Lawrence Ryan

P. 97: Line 3 should read “own inverse, $y_i \oplus y_j$ is the parity of bits $i - 1$ through j of x , for $i \geq j$.”

—Michael Pyne

P. 100, line 6: The “)” near the end of the line should be a “}”.

—Lawrence Ryan

P. 101, first line of second paragraph: The “5 + ...” should be “6 +”
And third line of fourth paragraph, “... takes 11” should be “... takes 12”.

—Lawrence Ryan

P. 106, last line: The “ $\dots - 2^{30} + 1 \dots$ ” should be “ $\dots - 2^{30} - 1 \dots$ ” (change + to -).

—Lawrence Ryan

P. 115 line 7: $\log_2(\Lambda) + 1$, should be $\lfloor \log_2(\Lambda) \rfloor + 1, .$

—Lawrence Ryan

P. 120, 9th line up from bottom: Needs a “)” between the “4081” and the “>>”. That is, the line should be (note the thin spaces etc.):

```
return table[(y*0x0002 0408 1020 4081) >> 56];
```

—Jasper Neumann

P. 132, 9th line up from bottom: “mn” should be “nm” (i.e., “vutsrqpo nm ...”).

—HSW

P. 141 line 2: Replace the period at the end of this sentence with “of 2^n bits for odd n , and the bit reversal of the outer perfect shuffle for even n .”

—Lawrence Ryan

P. 142 line 3: Change “2” to “16”, so that it reads “... size 16×3 bytes.”. Also on this page, in Figure 7-5, change $m = 2$ to $m = 16$.

—Lawrence Ryan

P. 144, 12th line up from bottom: change “no” to “little”, so that it reads “... has little instruction-level parallelism.”

—Jasper Neumann

P. 145 lines 1 and 2: “char A[8]” should be “char* A” and “char B[8]” should be “char* B”.

—Lawrence Ryan

P. 149 line 14: “0..8” should be “8..15”.

—Lawrence Ryan

P. 155 lines 4 and 5: “m1” should be “mv0” and “m4” should be “mv4”.

—Lawrence Ryan

P. 156 last line should be “x = ((x ^ t) & mv) ^ x;”.

—Lawrence Ryan

P. 186, Figure 9-1, 5th line from the end of the program, change “n” to “n-1”. Between the 3rd and 4th lines from the end of the program, insert the line

```
r[n-1] = un[n-1] >> s;
```

The last seven lines should then be:

```
if (r != NULL) {
    for (i = 0; i < n-1; i++)
        r[i] = (un[i] >> s) | (un[i+1] << (16-s));
    r[n-1] = un[n-1] >> s;
}
return 0;
}
```

—HSW

P. 220, first of the three equations in the middle of the page: the “3” should have an exponent of 2, so that it reads “ $2^{15} + 1 = 3^2 \cdot 11 \cdot 331$ ”.

—Jasper Neumann

P. 224 line 7, the number 715,827,833 should be 715,827,883.

—Colin Bartlett

P. 228, penultimate line, change “of three” to “of two”.

—Paolo Bonzini

P. 240, Figure 10-4: Replace lines 2 and 3 of this program with the following two lines:

```
nc = ((nmax + 1) / d) * d - 1
nbits = len(bin(nmax)) - 2
```

—Colin Bartlett

P. 329, first line below Figure 14-7, “see exercise 1” should be “see exercise 2”.

—Lawrence Ryan

P. 233, Figure 10-2: This program has a bug in that it gives an incorrect result for $d = 0x80000001$ (only). To fix it, change line 6 (“`int p;`”) to

```
int p, gt = 0;
```

Insert after line 17 (“`p = p + 1;`”), the line

```
if (q1 >= 0x80000000) gt = 1; // Means q1 > delta.
```

preceded by six spaces. Change the 6th line from the bottom (“ `} while (p < 64 &&)`”) to

```
    } while (gt == 0 &&
```

—Colin Bartlett

P. 342, middle, in the assignment to `p0`, change the “^” symbol to “&” (so that it is similar to the following line).

—Paolo Bonzini

P. 407, Answer no. 2, line 9: Change x to n , so that it reads “... depends upon whether or not $n = 0$, ...”.

—Lawrence Ryan

P. 411, answer to question 11, 2nd line: $c(n)$ should be c_n .

—Lawrence Ryan

P. 416, line 6: Change “it is an odd multiple of 2.” to “it is a multiple of 10 and an odd multiple of 2.”

Same page, line 9: This line should be:

```
“if (r > 5 || (r == 5 && (y & 2) != 0))”
```

Same page, line 14 should be:

```
"if (r == 0 && (y & 2) != 0)"
```

—Lawrence Ryan

P. 417, line 11, "`nlz(c & d)`" should be "`nlz(b & d)`".

Same page, line 19: "The maximum value is ***c*** | ***d***" should be "... ***b*** | ***d***".

—Lawrence Ryan

P. 477, entry for [Reiser], append the following:

An earlier source of this technique, described in considerable detail, is Crocker, Steve. "A Note on Padding." In *Network Working Group Request for Comments* (RFC) #70, 15 October 1970, UCLA. Available on the web.

—Neil Viberg

P. 489: Replace the last two index entries for M with the single entry:

MUX (multiplex) operation, 42, 56, 131, 163, 406

—Jasper Neumann

P. 494, last line: "Zero means $2n$ " should be "Zero means 2^{**n} ".

Actually, an exponent would be preferable here. This would require changing " $2n$ " to 2^n in the index entry, and changing " 2^{**n} " to 2^n in the section heading on page 22, and in the TOC entry on page vii.

Non-substantive errors (typographical etc.)

P. 5, Table 1-2, line beginning "addis": Change the expression "`I | | 0x0000`" to "`I << 16`". (Retain the parentheses.)

—Jasper Neumann

P. 17, Table 2-1: Would be nice if the second and third columns were separated by a heavier vertical line than is used elsewhere in this table.

—Jasper Neumann

P. 41, lines 9-12: The text to the left of the `/"` should be lined up on the same horizontal line as the text beginning with `/"`.

—Jasper Neumann

P. 43 line 19, 65 line 5, and 430 line 8: Change "GPR" to "register".

—Jasper Neumann

P. 47, graphic near top of page: Would be preferable if only the B and D blocks had a gray background, and if the A, C, and E blocks had a white background.

—Jasper Neumann

P. 73 last line before Section 4-3: Delete the word “either”, so that it reads “... that is, if u or v is **true**.”

—Jasper Neumann

P. 113, last paragraph: “The sum of the rows are” should be “The sums ...”.

—Lawrence Ryan

P. 137, line 4: Delete “the,” so that it reads “... including one *multiply*”

—Jasper Neumann

P. 148, first line of Figure 7-8: Needs a space after `>>`. That is, “`>>j`” should be “`>> j`”.

P. 264, Figure 10-23 line 4: Add the text “`// (Signed shift)`.” so that the “`/`” lines up with that on the previous lines.

—Jasper Neumann

P. 387 formula at line 6: The limits a and b are too close to the integral sign.

—Norman Koch

P. 391 lines 19 and 22, and p. 393 line 4: The large decimal numbers should have commas, that is: 6,700,417 and 274,177 and 67,280,421,310,721 and 203,005 and 203,000.

—Jasper Neumann

P. 409, line 9: “instuctions” should be “instructions”.

—Lawrence Ryan