

*Artificial Intelligence: A New Synthesis*

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Errata

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1. On page 26 in the second paragraph of Section 2.1.4, replace the sentence that begins with “The number of monomials . . .” and the accompanying formulas with:

“The number of monomials of size exactly  $k$  is:

$$\sum_{i=0}^k 2^i \binom{n}{i}$$

where  $\binom{n}{i}$  is  $n!/[(n-i)!i!]$ , the binomial coefficient.”

In the third paragraph of that page, replace the sentence that begins “There are  $3^n$  possible clauses . . .” with:

“There are  $3^n$  possible clauses and  $\sum_{i=0}^k 2^i \binom{n}{i}$  clauses of size  $k$ .”

I thank Mr. Xiaobo Dong for pointing out this formula for the number of monomials and clauses.

**The publisher has corrected the following errors in printings subsequent to the third. Item 17 is not actually an error but an “author’s lapse.”**

1. There is an error in Figure 2.1, page 22. The robot at the lower left would actually move clockwise not counterclockwise as the figure claims. If it were re-positioned one cell upward, it would then move counterclockwise.
2. The equation for  $f$  in the second line of the last paragraph on page 50 should have been “ $f = 0.655$ ”.
3. On page 66, the third line of code should have concluded with “south)))”.
4. On page 67, the first line of code under the diagram of Figure 4.7 should read:  
(IF (AND (NOT (ne))
5. In step 6 on page 142 and on page 143 (both places) add the sentence “Put these members of  $\mathcal{M}$  on *OPEN*.”
6. In the third equation on page 176, the last  $n_i$  should be replaced by  $n_i$ .

7. On the bottom of page 184, replace the sentence “The arcs in Figure 11.4 are consistent if there is a solution to the Four-Queens problem.” with “The arcs in Figure 11.4 are consistent because for each pair  $q_i$  and  $q_j$  ( $i \neq j$ ) and for each value of  $q_i$  there is a value of  $q_j$  that does not violate the constraint.”
8. On the bottom of page 187, replace the sentence “The operators change a data structure so that it violates fewer constraints.” with “The operators produce a new data structure that corresponds to a different proposed solution.”
9. Figure 12.3 on page 200 had a minor error in the tic-tac-toe board that is third from the bottom of the figure. The circle in that board should be in the middle cell of the right-hand column. (The evaluation of that board, namely  $6 - 5 = 1$ , is correct.)
10. The mention of the deduction theorem, stated on the bottom of page 228, should also have included “and vice versa.”
11. In the two formulas in the middle of page 249, replace “ $\text{Inroom}(y, 28)$ ” with “ $\text{Inroom}(y, 29)$ ”.
12. On page 289, the value for  $r_{\text{RATING}}$  should be  $1/3 = 0.33$  instead of 0 in the equations just under Table 17.2. This error requires a modification to the paragraph just below these equations. Replace the paragraph that begins with “Again, a tie. . . .” with the following paragraph: “The largest is  $r_{\text{RATING}}$ , which gives us the rule  $\text{RATING} \supset \text{OK}$ . This rule covers negative instances 5 and 9, so we must add another atom to the antecedent. The  $r$ 's are”

We also have to change the equations just below that paragraph. The new equations are:

$$\begin{aligned} r_{\text{APP}} &= 1/2 = 0.5 \\ r_{\text{INC}} &= 1/2 = 0.5 \\ r_{\text{BAL}} &= 0/0 \end{aligned}$$

which are to be followed by:

“We select APP to give us . . .”

13. Exercise 17.4 on page 299 had a typographical error. “W3” should be replaced by “W4”.
14. The formula at the top of page 308 should be replaced by:
 
$$(\forall y) \{ \text{Occurs}(\text{Flow}, y) \supset (\exists x, z) [ \text{Occurs}(\text{Turn\_ccw}, x) \wedge \text{Occurs}(\text{Turn\_cw}, z) \wedge \text{Overlaps}(x, y) \wedge \text{Overlaps}(y, z) ] \}$$
15. In the first paragraph of page 329, the two numerators in the equation at the beginning of the third line should be “ $0.145 \times 0.7$ ” and “ $0.1015$ ” respectively. The fourth line should then read: “ $p(\neg L | \neg M) = 0.7379$ .”

16. In the second line of the last paragraph before section 19.5 on page 329, the equation should have read “ $p(\neg L \mid \neg B, \neg M) = 0.30$ ”.
17. The calculation of  $p(P11|P10)$  toward the bottom of page 335 (in 19.7.2) can be avoided by noting that P15 d-separates P10 and P11, and therefore P10 and P11 are independent—a fact that was even noted on page 336! (The d-separation of P10 and P11 by P15 was pointed out by David Lu and Abdallah Mohamed.)
18. A better statement of step 3 on page 365 would be: “Express the effects of actions by wffs. In some formulations . . .”
19. Two co-authors were omitted in the Schaeffer, et al. 1992 bibliographic entry on page 485. At the end of the list of authors listed, add Lu, P., and Szafron, D.

Please let the author know of any other errors ([nilsson@cs.stanford.edu](mailto:nilsson@cs.stanford.edu)).