Languages and Machines
An Introduction to the Theory of Computer Science

Errata

Chapter 1.

Page | Line | Change
10  | -9  | 2 \cdot 7 + 1 = 15 (replace 13 with 15)

Chapter 2.

Page | Line | Change
46  | -9  | Recursive step: If \( u \in L \) and \( u \) can be written \( u = xyz \), then \( xaybz \in L \) and \( xbyaz \in L \).
56  | line 4 in Table 2.2: replace “zero or more” with “one or more”
57  | 20  | replace “matched six time” with “matched seven times”
58  | 17  | replace “The valiant never” with “The valiant never”

Chapter 4.

Page | Line | Change
126 | -7  | \( X \in X_3,4, B \in X_5,5, \) and \( T \rightarrow XB \) is a rule.

Chapter 5.

Page | Line | Change
133 | 5   | accepted strings for \( q_3 \) should be \((ab*a*b ∪ bb*a)(aa*b ∪ bb*a)*\)
158 | -7  | add sentence “Similarly, \( aabc \) is rejected since there is no transition from state \( q_1 \) for the symbol \( a \).”
159 | 3   | processing of the entire input string. (add word input)
163 | -5  | replace “to singleton sets of states” with “to sets with a single state”
169 | -5  | Another \( \lambda \)-arc is added from \( q_0 \) to \( q_f \).
188 | 9   | in Exercise 39, reference should be to Exercise 23.

Chapter 6.

Page | Line | Change
194 | 3   | with a single accepting state. (replace “set” with “state”)
196 | 3   | diagram at top of the page should be:

![Diagram]

196 | 3   | string at the end of line should be \((ab*a*b ∪ bb)(ab*a*b)*a\)
202 | 15  | language (was misspelled)
217 | 11  | reference in Exercise 1 should be to Section 6.1
217 | 16  | an even number of \( a \)'s and an even number of \( b \)'s. (replace “odd” with “even” in Exercise 3)
218 | 10  | Exercise 10: is \( \bigcup_{i=0}^{\infty} L_i \) necessarily regular?
218 | -4  | \( \{a^n b^m | 0 \leq n < m \} \)

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Chapter 7.

Page Line
249-7 \{a^i b^j c^k \mid 0 < i < j < k < 2i\} (replace zi with 2i)
258-6 the strategy employed by this machine can be modified
266 in the state diagram: the state under \( q_a \) should be \( q_t \)
2697 strings with one \( b \)
275-14 string can be sequentially generated
2762 as shown in Table 8.1
2814 (Exercise 23).

Chapter 8.

Page Line
274 in the state diagram: \( q_3 \) at bottom of graph should be \( q_5 \)

Chapter 9.

Page Line
312 diagram \( M_1 \): the label on the arc from \( q_5 \) should be \( 1/1L \)

Chapter 10.

Page Line
3252 of a language.
328-4 the left-hand side of a rule contains
335 Figure 10.1 caption: \( S_a \to aA_S \)

Chapter 11.

Page Line
348 diagram \( \Sigma^* \): * should be a superscript of \( \Sigma \)
351-4 should be \( R(G')000en(v_3) = 110111001101100111101110001111 \)

Chapter 12.

Page Line
363 second diagram: ‘halt’ and ‘loop’ are on the wrong output arrows

Page Line
383-3 \([baa, abaaa] \)
3856 the reference should be to Exercise 21

Chapter 15.

Page Line
4771 arc from \( i_j \) to \( i_{j-1} \)
495 state diagram in Exercise 12: bottom arrows go in wrong direction
Chapter 16.

Page Line
510 -1 $y'_j$: the same as $y_j$
511 first table: replace $y_2$ with $y_m$ and $y'_2$ with $y'_m$
527 Exercise 9: misspelling of “processor” and delete “the”

Chapter 17.

Page Line
547 1 $\alpha_1$ should be

$$\alpha_1 = \lambda$$

$$\cup (\Sigma - \{[q_0, B]\})\Sigma^*$$

$$\cup [q_0, B]((\Sigma - \{[*, a_1]\})\Sigma^* \cup \lambda)$$

$$\cup [q_0, B][*, a_1]((\Sigma - \{[*, a_2]\})\Sigma^* \cup \lambda)$$

$$\vdots$$

$$\cup [q_0, B][*, a_1][*, a_2] \ldots [*, a_{n-2}]([\Sigma - \{[*, a_{n-1}]\})\Sigma^* \cup \lambda)$$

$$\cup [q_0, B][*, a_1][*, a_2] \ldots [*, a_{n-1}][*, a_n]((\Sigma - \{[*, B]\})\Sigma^* \cup \lambda)$$

$$\vdots$$

$$\cup [q_0, B][*, a_1][*, a_2] \ldots [*, a_{n-1}][*, a_n][*, B]^{s(n)-n-2}([\Sigma - \{[*, B]\})\Sigma^* \cup \lambda)$$

547 17 $\ldots [*, x][q_i, a][*, y] \ldots [*, x][*, b][q_j, y] \ldots$
547 20 “$\Sigma^{s(n)-n-1}$” not “$\Sigma^{s(n)-1}$”

Chapter 18.

Page Line
556 -13 delete “$|A + T$”

Appendix IV.

Page Line
632 rule 9: $< Type > \rightarrow < PrimitiveType > | < ReferenceType >$
rule 10: $< PrimitiveType > \rightarrow < NumericType > | boolean$