

Languages and Machines  
 An Introduction to the Theory of Computer Science  
*Errata*<sup>1</sup>

**Chapter 1.**

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

**Chapter 2.**

Page	Line	
46	-9	Recursive step: If $u \in L$ and $u$ can be written $u = xyz$ , then $xybz \in L$ and $xyaz \in L$ .
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 “ <i>The valiant never</i> ” with “ <i>The valiant never</i> ”

**Chapter 4.**

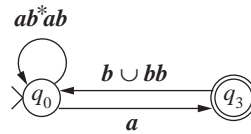
Page	Line	
126	-7	$X \in X_{3,4}$ , $B \in X_{5,5}$ , and $T \rightarrow XB$ is a rule.

**Chapter 5.**

Page	Line	
153	5	accepted strings for $q_3$ should be $(ab^*aa^*b \cup bb^*a)(aa^*b \cup bb^*a)^*$
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	
194	3	with a single accepting state. (replace “set” with “state”)
196		diagram at top of the page should be:



196	3	string at the end of line should be $(ab^*ab)^*a((b \cup bb)(ab^*ab)^*a)^*$
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		Exercise 10: is $\bigcup_{i=0}^{\infty} L_i$ necessarily regular?
218	-4	$\{a^n b^m \mid 0 \leq n < m\}$

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<sup>1</sup>December, 2007

## Chapter 7.

Page	Line	
249	-7	$\{a^i b^j c^k \mid 0 < i < j < k < 2i\}$ (replace $z_i$ with $2i$ )
258	-6	the strategy employed by this machine can be modified
266		in the state diagram: the state under $q_s$ should be $q_t$
269	7	strings with one $b$
275	-14	string can be sequentially generated
276	2	as shown in Table 8.1
281	4	(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 $1/1 L$

## Chapter 10.

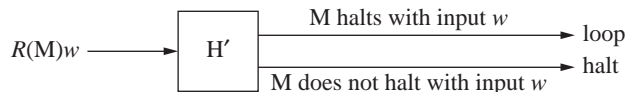
Page	Line	
325	2	of a language.
328	-4	the left-hand side of a rule contains
335		Figure 10.1 caption: $Sa \rightarrow aAS$

## Chapter 11.

Page	Line	
348		diagram $\Sigma^*$ : * should be a superscript of $\Sigma$
351	-4	should be $R(G')000en(v_3) = 110111001101100111101110011011110001111$

## Chapter 12.

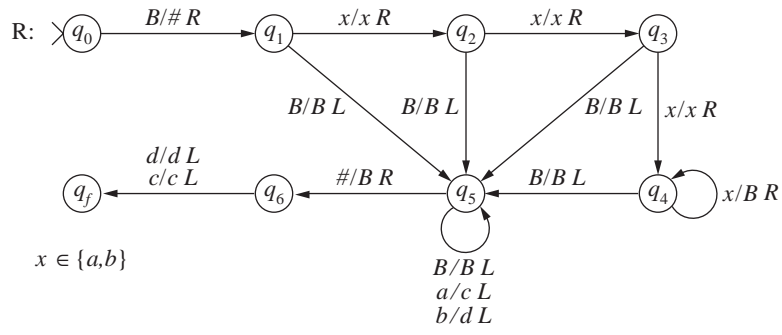
Page	Line	
363		second diagram: 'halt' and 'loop' are on the wrong output arrows



Page	Line	
383	-3	$[baa, abaaa]$
385	6	the reference should be to Exercise 21

## Chapter 15.

Page	Line	
477	1	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

$$\begin{aligned}
 \alpha_1 = & \lambda \\
 & \cup (\Sigma - \{[q_0, B]\})\Sigma^* \\
 & \cup [q_0, B]((\Sigma - \{[* , a_1]\})\Sigma^* \cup \lambda) \\
 & \cup [q_0, B][* , a_1]((\Sigma - \{[* , a_2]\})\Sigma^* \cup \lambda) \\
 & \quad \vdots \\
 & \cup [q_0, B][* , a_1][* , a_2] \dots [* , a_{n-1}]((\Sigma - \{[* , a_n]\})\Sigma^* \cup \lambda) \\
 & \cup [q_0, B][* , a_1][* , a_2] \dots [* , a_{n-1}][* , a_n]((\Sigma - \{[* , B]\})\Sigma^* \cup \lambda) \\
 & \quad \vdots \\
 & \cup [q_0, B][* , a_1][* , a_2] \dots [* , a_{n-1}][* , a_n][* , B]^{s^{(n)}-n-2}((\Sigma - \{[* , B]\})\Sigma^* \cup \lambda)
 \end{aligned}$$

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

### Chapter 18.

Page	Line	
556	-13	delete " $ A + T$ "

### Appendix IV.

Page	Line	
632	rule 9:	$\langle Type \rangle \longrightarrow \langle PrimitiveType \rangle   \langle ReferenceType \rangle$
	rule 10:	$\langle PrimitiveType \rangle \longrightarrow \langle NumericType \rangle   \mathbf{boolean}$