

## Errata for Compilers: Principles, Techniques, and Tools, Second Edition

This errata sheet applies to all printings. For printings prior to Spring, 2008, please see The First Errata Sheet.

Found an error not listed in the table below or in the First Errata Sheet? Please send email to ullman at gmail dt com.

Location	Problem	Reported By	Date Reported
p. 3, l. 9 below the figure	The intended meaning was that assembly code is easier to debug than machine code.	Sukhbir Singh	7/4/09
p. 6, l3	Comma needed after "60".	Lyle Goldman	10/17/09
p. 13, l9	Comma needed after "C".	Lyle Goldman	9/5/09
p. 18, l16	"removes" should be "remove".	Lyle Goldman	9/5/09
p. 28, l. 2	No comma after "variable".	Lyle Goldman	9/5/09
p. 36, l4	"and" needed before "profilers".	Lyle Goldman	9/5/09
p. 52, l. 6	1001 should be 1001.	Lyle Goldman	10/17/09
p. 73, l. 17	"while loop" should be "the while-loop".	Lyle Goldman	10/17/09
p. 81, l. 14	Comma needed after "lexer".	Lyle Goldman	10/17/09
p. 90, l. 13	Semicolon missing at end of line.	Michael Leuschel	2/12/08
p. 90, Fig. 2.38, l2, -1	The "}" at the end of the second-to-last line of the figure belongs at the end of the last line.	Michael Dudley	1/6/08
p. 91, l. 18	The production should have <b>type id</b> ; on the right.	Lyle Goldman	10/17/09
p. 95, l. <b>-</b> 2	"a operator" should be "an operator".	Han Lin	12/29/08
p. 104, l. 13-14	Both commas on I. 13 should be omitted, and the words "is evaluated" should be added after "right operand" on I. 14.	Lyle Goldman	10/17/09
p. 106, l11	"construct" should be "constructs".	Lyle Goldman	10/17/09
p. 161, l5	"two" should be "up to two".	Michael Dour	10/23/12
p. 208, I. 7	if stmt should be if expr.	Qi Ji	4/22/12
p. 227, l5	Delete "the" after "its".	Nish Sinnadurai	10/24/08
p. 230. Fig. 4.22	In the row for $E'$ , the productions should all have $E'$ rather than $E$ on the left side.	Lei Ju	9/5/08
p. 230, first line below Fig, 4.22	The erroneous input on that line would actually cause a synch action immediately, popping	Lei Ju	9/15/08
p. 251, Fig. 4.36, l2	"break" should be in boldface.	Michael Leuschel	2/12/08
p. 254, l4	"Fig. 4.31" should be "Fig. 4.37".	Daniel Mentz	3/6/08
p. 263, middle, first item in set <i>l</i> <sub>0</sub>	S on the left should be S'.	Michael Dudley	2/12/08
p. 281, l. 2	E needed in front of →( $E$ ).	Arto Kaarna	3/31/08
p. 282, Fig. 4.50, Itemset <i>I</i> <sub>4</sub>	Add $S \rightarrow iS$ .	Mike Polyakov	7/28/08

Page 2014   Pag	p. 283, Fig. 4.52	(4).	D'Aniello	2/27/08
4.54, last two lines   The Symbols on the stack should be $E+E$ on the penultimate line and just $E$ on the last line   Meritz	p. 285, first line below Fig. 4.53	"right" should be "left".	Lei Ju	9/15/08
A69, 1.4   Delete one with the	p. 286, Fig. 4.54, last two lines	The Symbols on the stack should be $E+E$ on the penultimate line and just $E$ on the last line.		3/6/08
p. 269, 19         Tooken'' should be "to the right".         Schultz         //290, p. 299, l. 14         "bellow" should be "to the right".         Helner Marken         10/28, Michael Bozon           p. 350, l. 10         S should be A.         Michael Bozon         620/1           p. 352, l. 14         "top -5" should be "top -6".         Darriel Mentz           p. 369, caption of Fig. 6.3         "Dag" should be "DAG".         Arb           p. 360, Fig. 6.4         A production similar to the first two for the operator " is needed.         Circ           p. 367, 3 lines         "by" should be "be".         Shobit Bellangdy           below Fig. 6.10         "by" should be "be".         Shobit Bellangdy           p. 372, 4 lines above Sect.         "dag" should be "In simpler words".         Arb           s.3.2         "In words" should be "In simpler words".         Seed Mehrabi           p. 406, L. 4         "Example 6.21" should be "Example 6.22".         Carl           p. 406, L. 4         "Example 6.21" should be x = 1 in each of the three parts.         Daniel           p. 646, L. 19         We must add a third step: Remove R from the address descriptors of variables other than X.         Hao Dang         12/12           p. 571, item 4, L.         "rf should be x-f+1.         Hao Dang         12/12           p. 571, item 4, L.         "rf should	p. 288, Example 4.69, l. 4	Delete one "with the".		7/28/08
D. 359, I. 14 below should be to the right.  D. 350, I. 10 S should be $A$ .  D. 359, Caption of Fig. 6.3 Page 3 should be "top - 6".  D. 359, Caption of Fig. 6.3 Page 3 should be "DAG".  D. 359, Caption of Fig. 6.4 A production similar to the first two for the operator *is needed.  D. 369, Fig. 6.4 A production similar to the first two for the operator *is needed.  D. 367, 3 lines below Fig. 6.10  D. 371, 1 lines below Fig.	p. 289, l9	"token" should be "tokens".	-	7/28/08
Dour   0.20/1   0.35/1.10   Schold be A.   Dour   0.20/1   0.35/1.14   "top -5" should be "top -6".   Dariel   0.31/1.06   0.35/1.14   "top -5" should be "top -6".   Dariel   0.31/1.06   0.5/1.06   0.35/1.06	p. 299, l. 14	"below" should be "to the right".		10/28/09
D. 359, Caption of Fig. 6.3 appears of the proper of the proper of the proper of Fig. 6.3 appears of Fig. 6.4 appears of Fig. 6.2 appears of Fig.	p. 350, l. 10	S should be A.		6/20/13
p. 367, ij. 6.3 p. 360, Fig. 6.4 p. 360, Fig. 6.10 p. 367, 31 lines below Fig. 6.10 p. 409, Exercise 5.6.4 p. 409, Exercise 5.6.4 p. 409, Exercise 5.6.4 p. 556, Fig. 8.18 p. 556, Fig. 8.18 p. 556, Fig. 8.18 p. 571, item 4, 1. p. 572, item 4, 1. p. 571, item 4, 1. p. 572, item 4, 1. p. 573, item 4, 1. p. 574, item 4, 1. p. 574, item 4, 1. p. 575, item 4, 1. p. 576, item 4, 1. p. 577, item 4, 1. p. 577, item 4, 1. p. 579, item 4, 1. p. 571, item 4, 1. p. 572, item 4, 1. p. 573, item 4, 1. p. 573, item 4, 1. p. 574, item 4, 1. p. 572, item 4, 1. p. 572, item 4	p. 352, l. 14			3/11/08
D'Aniello 2/27/0  D'Aniello 2	p. 359, caption of Fig. 6.3	"Dag" should be "DAG".		1/23/08
below Fig. 6.10 by should be 'be'. Beltangdy 5/10/16 above Sect. 3.3.2 "day" should be "DAG".  3.31/07 above Sect. 3.3.2 "in words" should be "In simpler words".  Ato Kaama 3/31/07 by 19/10/10/20/20/20/20/20/20/20/20/20/20/20/20/20	p. 360, Fig. 6.4	A production similar to the first two for the operator * is needed.		2/27/08
above Sect. "dag" should be "DAG". Saed Mehrabi and Saed Saed Mehrabi and	p. 367, 3 lines below Fig. 6.10	"by" should be "be".		5/10/12
In words* should be "in simpler words"   Mehrabi   Me	p. 372, 4 lines above Sect. 6.3.2	"dag" should be "DAG".		3/31/08
Example 6.21 should be Example 6.22 . Alphonce $\frac{41871}{6.64}$ p. 409, Exercise 6.6.4 $\times = 1$ should be $\times = 1$ in each of the three parts. $\times = 1$ should be $\times = 1$ in each of the three parts. $\times = 1$ should be $\times = 1$ in each of the three parts. $\times = 1$ should be $\times = 1$ in each of the three parts. $\times = 1$ should be $\times = 1$ in each of the three parts. $\times = 1$ should be $\times = 1$ in each of the three parts. $\times = 1$ should be $\times = 1$ in each of the three parts. $\times = 1$ should be $\times = 1$ in each of the three parts. $\times = 1$ should be $\times = 1$ in each of the three parts. $\times = 1$ should be $\times = 1$ in each of the three parts. $\times = 1$ should be $\times = 1$ in each of the three parts. $\times = 1$ should be $\times = 1$ in each of the three parts. $\times = 1$ should be $\times = 1$ in each of the three parts. $\times = 1$ should be $\times = 1$ should	p. 393, last line of box	"In words" should be "In simpler words".		1/7/09
Second	p. 406, l4	"Example 6.21" should be "Example 6.22".		4/15/11
p. 543, l. 19	p. 409, Exercise 6.6.4	x == 1 should be $x = 1$ in each of the three parts.		1/29/10
8.18, the unnamed block at the far right $p_1$ at the far right $p_2$ by $p_3$ and $p_4$ and $p_5$ and $p_6$ are the special $p_6$ and $p_6$ are the special	p. 545, l. 19	·	Hao Dang	12/12/09
p. 594, Fig. 9.9. In box $B_5$ , t7 and t10 should be t2 and t4, respectively.  Even below figure  An additional pair of parentheses is needed around $gen_1 \cup (x - kill_1)$ .  By does not define $i$ or $j$ , since they are used before definition (assuming no aliases).  By does not define $i$ or $j$ , since they are used before definition (assuming no aliases).  By does not define $i$ or $j$ , since they are used before definition (assuming no aliases).  By does not define $i$ or $j$ , since they are used before definition (assuming no aliases).  By does not define $i$ or $j$ , since they are used before definition (assuming no aliases).  By does not define $i$ or $j$ , since they are used before definition (assuming no aliases).  By does not define $i$ or $j$ , since they are used before definition (assuming no aliases).  By does not define $i$ or $j$ , since they are used before definition (assuming no aliases).  By does not define $i$ or $j$ , since they are used before definition (assuming no aliases).  By does not define $i$ or $j$ , since they are used before definition (assuming no aliases).  By does not define $i$ or $j$ , since they are used before definition (assuming no aliases).  By does not define $i$ or $j$ , since they are used before definition (assuming no aliases).  By does not define $i$ or $j$ , since they are used before definition (assuming no aliases).  By does not define $i$ or $j$ , since they are used before definition (assuming no aliases).  By does not define $i$ or $j$ , since they are used before definition (assuming no aliases).  By does not define $i$ or $j$ of $i$ or $i$	p. 556, Fig. 8.18, the unnamed block at the far right	ST a, R2 <b>should be</b> ST d, R2.	Hans Ji	7/26/08
p. 694, Fig. 9.9. In box $B_5$ , it and the should be iz and it, respectively. Schultz 59/08 p. 604 first line below figure An additional pair of parentheses is needed around $gen_1 \cup (x - kill_1)$ . Hideyuki Kawabata 11/29/09. 609, Example 9.13, I. 4-5 p. 607, Exercise 9.2.10, I. 3 Fig. 8 gen_B should be $use_B$ . Gyun Woo 3/22/09. These items should be combined as: 8(b) For all blocks $B$ such that $x+y$ is in $latest[B]$ intersect $used[B]$ .out: 1. Add $t=x+y$ at the beginning of $B$ . 2. Replace every original $x+y$ by $t$ . Fig. 663, I. 10 Node 8 has two $unvisited$ successors. Tony Pan 1/22/19 p. 669, I. 2 Tony Pan 1/22/19 p. 696, I. 2 Tony Pan 1/24/19 p.	p. 571, item 4, l. 3	<i>r-j</i> should be <i>r-j</i> +1.	Hao Dang	12/12/09
below figure  p. 609, Example p. 609, Example p. 13, I. 4-5 p. 617, Exercise p. 20, 2.10, I. 3  These items should be combined as: 8(b) For all blocks $B$ such that $x+y$ is in latest[ $B$ ] intersect used[ $B$ ].out: 1. Add $t=x+y$ at the beginning of $B$ . 2. Replace every original $x+y$ by $t$ .  Richard p. 663, I. 10 Node 8 has two unvisited successors.  P. 696, I. 2  Node 8 has two unvisited successors.  Tony Pan 1/22/1  Gyun Woo 1/22/1  Brine (4)" should be "line (3)".  Gyun Woo 10/24/1  Brine (4)" needed after "function".  Richard Yoo 2/3/10  Brine (4)" should be "line (3)".  Gyun Woo 10/24/1  Brine (4)" should be "line (3)".  Brine (4)" needed after "function".	p. 594, Fig. 9.9.	In box $B_5$ , t7 and t10 should be t2 and t4, respectively.		5/9/08
9.13, I. 4-5  p. 617, Exercise 9.2.10, I. 3  These items should be use <sub>B</sub> .  Gyun Woo 3/22/0  These items should be combined as:  8(b) For all blocks B such that x+y is in latest[B] intersect used[B].out:  1. Add t=x+y at the beginning of B. 2. Replace every original x+y by t.  p. 663, I. 10  Node 8 has two unvisited successors.  p. 689, I9  "line (4)" should be "line (3)".  Gyun Woo 10/24/0  Beck  p. 696, I. 2  "remove one "also"  Temove one "also"	p. 604 first line below figure	An additional pair of parentheses is needed around $gen_1 \cup (x - kill_1)$ .		11/29/12
These items should be combined as:  8(b) For all blocks B such that x+y is in latest[B] intersect used[B].out:  1. Add t=x+y at the beginning of B. 2. Replace every original x+y by t.  1. Node 8 has two unvisited successors.  1. Add t=x+y at the beginning of B. 2. Replace every original x+y by t.  1. Add t=x+y at the beginning of B. 2. Replace every original x+y by t.  2/3/10  2/3/10  2/3/10  3/2/10  5/2/10  6/	p. 609, Example 9.13, l. 4-5	$B_2$ does not define $i$ or $j$ , since they are used before definition (assuming no aliases).		2/12/08
8(b) For all blocks <i>B</i> such that x+y is in <i>latest[B] intersect used[B].out</i> :  1. Add t=x+y at the beginning of <i>B</i> .  2. Replace every original x+y by <i>t</i> .  D. 663, I. 10 Node 8 has two <i>unvisited</i> successors. D. 689, I9 "line (4)" should be "line (3)".  D. 696, I. 2 "of" needed after "function".  D. 696, I. 2 "remove one "also"  D. 739, 15 remove one "also"  Richard Yoo  2/3/10  2/3/10  2/3/10  2/3/10  2/3/10  2/3/10  3/3	p. 617, Exercise 9.2.10, l. 3	gen <sub>B</sub> should be <i>use</i> <sub>B</sub> .	Gyun Woo	3/22/08
p. 689, l9 "line (4)" should be "line (3)".  Gyun Woo 10/24/  Jarryd Phillip Beck 6/26/1  p. 739, 15 remove one "also"	p. 654, items 8(b) and 8(c)	8(b) For all blocks $B$ such that $x+y$ is in <i>latest[B] intersect used[B].out</i> :  1. Add $t=x+y$ at the beginning of $B$ .		2/3/10
p. 696, I. 2 "of" needed after "function".  Jarryd Phillip Beck  p. 739, 15 remove one "also"  Jark 2/12/1	p. 663, l. 10	Node 8 has two <i>unvisited</i> successors.	Tony Pan	1/22/13
p. 696, I. 2 "of" needed after "function". Phillip Beck 6/26/1	p. 689, I9	"line (4)" should be "line (3)".		10/24/08
7 / 39   15	o. 696, l. 2	"of" needed after "function".	Phillip	6/26/11
TV Addell	p. 739, 15	remove one "also"	Jack Wadden	2/12/12

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10.23, l. 7, 15, and 17	There are three ADD R3, R3, R4 instructions that should all be ADD R3, R3, R5.	Borin	9/28/11
p. 751, l11	$n_1 \rightarrow n_2$ should be $n_2 \rightarrow n_1$ .	Roger Liao	4/3/10
p. 752, Fig. 10.27	Left box for <i>c</i> needs to be shaded.	Roger Liao	4/3/10
p. 757, attempt 5 of Fig. 10.30	The range of <i>d</i> is (6,6), not (5,5).	Frank Chen	3/14/14
p. 788, l. 4	"row" should be "column", since row-major order is stipulated.	Gyun Woo	10/27/08
p. 792, items 2, 3, 4 above Example 11.8	<b>B</b> really has 2 <i>d</i> rows, and <b>b</b> and <b>0</b> are of length 2 <i>d</i> .	Ge Gan	10/24/08
p. 795, l. 2	Z[1,7] should be Z[7,1].	Jungwon Kim	1/12/09
p. 807, l5	The first <i>i</i> should be 1.	Gyun Woo	11/4/08
p. 816, middle, inequalities (2a) and (2b)	"+ <b>b</b> " is missing from the left side of (a) and "+ <b>b</b> " is missing from the left side of (b).	William Deng	7/25/08
p. 819, l. 1-2	"read and write accesses" should be "two write accesses".	Gyun Woo	1/9/08
p. 836, item 5, line 2	"-1" should be "1".	Gyun Woo	11/4/08
p. 848, Scaling example, third line of code on the left	2N should be 2*N.		3/06/08
p. 849, Permuation example, second line on the right	i++ should be q++.		3/06/08
p. 861, l8	Remove the comma after "local".	Gyun Woo	2/18/08
p. 865, l2	"code in (b)" should be "code in (c)".	Gyun Woo	2/20/08
p. 899, l15	Reference [6] should be [10].	Shih-Wei Liao	2/27/08