Minor Errata and Additions for the First and Second Printings of Advanced Compiler Design and Implementation

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Change History

Date	Change
9 Sept 1998	Added correction for p. 185, line 18
19 Nov 1998	Added corrections for pp. 86, 540, and 542

Preface

P. xxviii: In line 14, change "the exercises and an Instructor's Guide" to "selected exercises"; and, in line 15, change "The Instructor's Guide" to "Book-related materials".

P. xxix: In line 5, after "Das," insert "Amer Diwan,"; and after "Porterfield," insert "Arch Robison,".

Chapter 1. Introduction to Advanced Topics

P. 5: In Figure 1.2(a), line 2, replace "`:=`" by "$\leftarrow$"; and, in Figure 1.3, box `B2`, line 2, delete the "`=`".

P. 8, Figure 1.5, caption: Before each occurrence of "medium-level" and "low-level" insert "a"; after "(a)" insert "the low-level model,"; and after "(b)" insert "the mixed model,".

P. 17, first full paragraph, line -2: Change "an 8-bit" to "a 6-bit".

Chapter 2. Informal Compiler Algorithm Notation (ICAN)

P. 26, Table 2.3, line -1: Change "[*TypeExpr* | $\emptyset$]" to "*TypeExpr*".

P. 27, Table 2.5: In line 8, change "$\notin$ | $\oplus$" to "$\notin$ | $\times$ | $\oplus$"; and insert the line "*Variable* $\longrightarrow$ *Identifier*" at the end of the table.

P. 31: In the table, add the line "Product $\times$" after the line "Difference   `-`".

P. 34, line -4: Change "*one-to-one*" to "*single-valued*".

P. 37, line -5: Change the second occurrence of "`true`" to "`7`".

P. 38, line 12: Change "and not to" to "rather than to".

Chapter 3. Symbol Table Structure

P. 45, line 2; Change "explicit" to "(implicit or explicit)".

P. 46: In Table 3.1, "`machtype`" entry, line 3, change "of" to "the type of"; and, in line -3 of the text, change ",*t0*]" to "],*t0*".

P. 54: In line -4, insert "RISC" after "Some".

P. 57: In line -2 of the text, insert "might" after "instructions".

P. 65, Exercise 3.5, line 2: Change "Section 3.3" to "Section 3.2".

Chapter 4. Intermediate Representations

Many occurrences of *Const* in this chapter are to be changed to *Integer* to reflect the fact that, in those contexts, the constant must be an integer. They are as follows:

P. 74, Table 4.2, *IfInst* item
P. 79, Table 4.4, *TrapInst* item
P. 80, Table 4.5 (all six occurrences)
P. 83, Table 4.7, lines -8 through -3 (all six occurrences)
P. 89, Table 4.9 (all 12 occurrences)
P. 91, lines -2 and -1 of Table 4.10 (both occurrences)

P. 73, line -12: Delete the text "each representing operations,".

P. 78, line -10: After "*AssignInst*", insert ", *TrapInst*,".

P. 80, line -1: Change "address" to "address, which is the address of the `call` instruction".

P. 81: In line -2, delete the words "a quoted sequence of characters representing".

P. 84: In line -4 of Table 4.7, after "*Const*", insert "(includes *Integer*)", and in line -3, change "`"1"`" to "`1`".

P. 86, Figure 4.9: In the text for `Inst[4]`, change "`kind:if`" to "`kind:binif`", and in `Inst[7]` and `Inst[11]`, change the occurrences of "`"type1"`" and "`"int"`" to "`type1`" and "`int`", respectively.

P. 90: In line -4 of Table 4.9, after "*Const*", insert "(includes *Integer*)".

P. 91: In line 3 of Figure 4.13, change "`"4"`" to "`4`".

P. 92: In Figure 4.13, lines 5 and -4, change "`"0"`" to "`0`" and "`"-8"`" to "`-8`"; and, in line -12 of the text, change ")," to ") and basic-block scheduling (Section 17.1),".

P. 102, Exercise 4.1: In line 8, change "`i = 0`" to "`i == 0`"; and, in line -5, change "`a[j] != 0`" to "`a[j] != 0.0`".

Chapter 5. Run-Time Support

P. 107: Change lines 6 through 9 to the following:

> performing loads and stores,[2] respectively, although PowerPC supports both single- and double-precision formats directly. The Intel 386 architecture supports an 80-bit format in its floating-point registers. Operations may round to single or double according to the setting of a field in a control register. Loads and stores may convert single- and double-precision values to and from that format or load and store 80-bit values. For most architectures, the

insert footnote 2 at the bottom of the page as follows:

> 2. POWER also has a fused multiply and add that uses the full-length product as an operand of the add.

and renumber the remaining footnotes in Chapter 5 as numbers 3 through 7.

P. 120: In item 4, interchange the text for items "(b)" and "(c)"; and, in line -1 of the first full paragraph, change "the next section" to "Section 5.7".

Chapter 6. Producing Code Generators Automatically

P. 139: In line 1, change "a machine description from a code generator" to "a code generator from a machine description" and, in line 10, change "The" to "Our".

P. 142: Insert before line 21 the following text:

> Note that the sets of terminal and nonterminal symbols almsot always have a nonempty intersection.

change the first word of line 21 from "It" to "The code generator"; and, in line 23, change "a member" to "members".

P. 146, Figure 6.7, line -7: Change "`s`" to "`s, item`".

P. 159, line -9: Change "higher" to "medium".

P. 166: In line -6 of Section 6.6, change "Ahal93" to "AhaL93".

Chapter 7. Control-Flow Analysis

P. 170, Figure 7.2, line 1: Change "`m`" to "`m (val)`".

P. 171, Figure 7.3, box 1: Change "`m`" to "`m (val)`".

P. 174, lines 11, 12, 15, 16, 18, 19, 21, and 28: Change all seven occurrences of "`setjump( )`" to "`setjmp( )`".

P. 179, Figure 7.11(c): Label the dashed edge from `B` to `C` with a "`C`".

P. 185, line 14: Change "`no`" to "`n0`".

P. 185, line 18: Change "$Dfn(v_i) > Dfn(w)$" to "$Dfn(v_i) < Dfn(w)$".

P. 188, Figure 7.8, lines 10 and -20: Change "`>=`" to "≥".

P. 194, line -5: Change "r" to "r, $Succ$".

P. 199: In Figure 7.30, change the label under the leftmost arrow from "*T1, T2*" to "*T2*"; and, in line -7, change "shows" to "show".

P. 215: In line 2, change the last three words to "discussed in [JaiT88], but the approach, as described there, is flawed—its intentional definition of the improper region dominated by a given node results in its containing just that node.", and, in line 5, change "`setjump( )`" to "`setjmp( )`".

Chapter 8. Data-Flow Analysis

P. 231, line 2 of the last paragraph on the page: Change the first occurrence of "N" to "N and a lattice **L**", and the second occurrence to "N,".

P. 241: In item 2, line 1, change "the system" to "the recursive system", and in item 3, delete line -1 and end the preceding line with a period.

P. 243: In line 20, change "above" to "above (see Table 8.2)".

P. 251: In line 1 of the second paragraph of Section 8.10, change "a set" to "a function from variables and basic-block-position pairs to sets", and run-in the next paragraph.

P. 265: In Exercise 8.11, for consistency, change "(1)", "(2)", and "(3)", to "(a)", "(b)", and "(c)", respectively.

Chapter 9. Dependence Analysis & Dependence Graphs

P. 270, Figure 9.4(b): Delete the label "1" on the arc from node 6 to node 8.

P. 274, Figure 9.6: In line 4, delete "`set of`"; in line -7, replace "`<k,j>`" by "`k->j`"; and in line -6, replace "`Inst[k],Inst[j]`" by "`Inst[k],1,Inst[j],IssueLatency+1`".

P. 286, Figure 9.19: Replace the "`Y`"s on the edges from "`B1`" to "`B3`" and from "`B1`" to "`B4`" by "`N`"s.

Chapter 10. Alias Analysis

P. 306, item 5: Delete "$ptr_P(p2\text{->}p3)\ =$ ".

P. 308, item 1: Change "with" to "such that $stmt(P)$ has".

P. 317, Figure: 10.13: In line -10, replace "`==`" by "`=`", and, in line -9, replace "`=`" by "`==`"

Chapter 12. Early Optimizations

P. 329: In line 2 of Section 12.1, change "values" to "operands".

P. 332–333: In Figure 12.3, line -2 and Figure 12.4, line 2, change "`%u`" to "`%s`".

P. 339, Figure 12.7, caption: Insert "address of the" before "Pascal".

P. 342: In lines -19, -18, and -13, change the five occurrences of "`1`" to "`1.0`" and, in line -13, the single occurrence of "`0`" to "`0.0`".

P. 343: Add to the end of the second paragraph the sentence

Use of the ANSI/IEEE inexact flag allows this to be determined easily.

P. 345, Figure 12.13: In line -10, change "`nblocks, m, i`" to "`m, i, nblocks`".

P. 356, fifth paragraph: Making the algorithm run in less than in $O(n^2)$ time depends on the implementation chosen for the set `ACP`. If it is implemented as a linearly searched array, the algorithm is order n^2; if it is implemented as a balanced tree, it is order $n \cdot \log n$; and if it is hashed, the time can be reduced to order n.

Chapter 13. Redundancy Elimination

P. 384, line 6 of the text: After "subexpressions" insert "(note that we assume that `m & n` produces an integer value)".

P. 388: In item 4 of the enumerated list, change "the first instruction *inst*" to "the expression *exp* in the first instruction *inst*" and add to the end of item 4 the text "where $Replace(inst, exp, tj)$ returns the instruction *inst* with *exp* replaced by tj.".

Chapter 14. Loop Optimizations

P. 431: In Figure 14.7 *(continued)*, in line 8, change "`IVs`" to "`the IVs structure`".

P. 434, line 2: Replace "`k   ,`" by "`k,   `".

P. 435, line 5: Delete the ")".

P. 436, item 4: Change "Put the assignment $tj \leftarrow b * i + c$" to the following:

> Put the pair of assignments
>
> $tj \leftarrow b * i$
> $tj \leftarrow tj + c$

P. 437, Figure 14.10: In line 19, change "`=1`" to "`= 1`".

P. 441, line -4: Change "dead-code elimination will remove it" to "induction-variable removal will eliminate it".

P. 446, line 5: Delete "for all i".

P. 450, Figure 14.22: Run in lines 1 and 2 as follows:

```
procedure Remove_IVs_LFTR(bset,nblocks,ninsts,Block,IVs,SRdone,Succ,Pred)
```

P. 451, item 5, line 4: Change "inverts" to "adjusts".

P. 454, line 18: Change "are" to "are one example".

P. 457, Figure 14.25(b), line 3: Delete "`L2:`".

Chapter 15. Procedure Optimizations

P. 462, line 1 of the text: Change “reegisters” to “registers”.

P. 463, line 8 of the text: Change “value” to “value returned by the callee”.

P. 471: In line -18, change “values” to “values on a SPARC system” and, in line -6, change “with copies” to “with instantiated copies”.

P. 473: In line 7 of the first paragraph in Section 15.4.2, change “`c`” to “`a`” and, in line -4 of the text, change “these” to “similar”.

P. 479, line -2: Change “register” to “registers”.

Chapter 16. Register Allocation

P. 487, Figure 16.3, line 12: Change “`list`” to “`sequence`”.

P. 491, Figure 16.7 *(continued)*, line 19: Change “`Webs - {web1}`” to “`Tmp1`”.

P. 495, footnote 4, line 1: Change “[BriT94]” to “[BriT93]”.

P. 502, Figure 16.16: In line 26, change “`CopyWt 10.0`” to “`CopyWt * 10.0`”.

P. 504: In line 7, change “by selecting” to “by optimistically selecting”; in line 8, delete “ and optimistically”; and in line 14, change “node so” to “node (as the value of the `rmvadj` field) so”.

P. 505: In line 4, change “`i, j,`” to “`i,`”; in line -15 of Figure 16.18, change “`stack`” to “`stack (the optimistic heuristic)`”; and, in line -4, change “performed” to “inserted”.

P. 510, Figure 16.24, line 8: Change “`or`” to “`and`”.

P. 515: In line 17, change “and adjacency matrix are as” to “is”, and, in Figure 16.32, delete part (b) and the “**(a)**” and “**(b)**” tags, and change the caption to “The interference graph that results from pushing `r1` through `r4` onto the stack.”

P. 516: In line 1 of the text, change “and adjacency matrix are as” to “is”, and, in Figure 16.33, delete part (b) and the “**(a)**” and “**(b)**” tags, and change the caption to “The interference graph that results from pushing `r5` onto the stack.”

Chapter 17. Code Scheduling

P. 539: In numbered item 3, change “dependency” to “dependence”, and add numbered item 5 as follows:

> **5.** `DagSucc(`i`,`D`)`, which is described above.

In line -8 of the text, change “nodes n” to “nodes n and that `Latency(`I_1`,2,`I_2`,1) = 1` for all pairs of instructions I_1 and I_2”.

P. 540: In Figure 17.6, line 5, change “`Node`” to “`integer`”; delete line -8; and change line -5 to “`Sched := []: sequence of Node`”. In the text, change each occurrence of “`Etime(`i`)`” to “`Etime[`i`]`”; in numbered item 1, change “**4**” to“**4**,”; and in line -3 of the text, change “8” to “6”.

P. 541: In Figure 17.7, delete all the edge labels.

P. 542: in line 5, change "`Etime(i)`" to "`Etime[i]`" and delete numbered item 3 and renumber items 4 through 6 as items 3 through 5.

P. 553: In numbered item 3, change "window" to "window, respectively".

P. 561, Figure 17.30, line 3: Change "`nblocks factor`" to "`nblocks, factor`".

P. 566, Figure 17.33: In line 10, delete "`, n`".

P. 574, line -6 of the text: Change "for architectures" to "for some architectures".

P. 576, line -10: Change "most" to "MOST".

P. 577, line -3: Change "interinstruction" to "inter-instruction".

Chapter 18. Control-Flow and Low-Level Optimizations

P. 582, Figure 18.2: In both parts (a) and (b), label with a "`Y`" the edge from block `B1` to `B4`.

P. 584, Figures 18.5 and 18.6: Change the declarations of the arguments `ninsts` and `Block` in both procedure definitions to

```
ninsts: inout array [1··nblocks] of integer
Block: inout array [1··nblocks] of array [··] of LIRInst
```

P. 591: In the last line of the text, change "the simple patterns given above" to "these simple patterns".

P. 593: In numbered item 2, change "$UD(v,\langle i,j\rangle)$" to "$\mathtt{UD}(v,\langle i,j\rangle)$" and in numbered item 3, change "$DU(v,\langle i,j\rangle)$" to "$\mathtt{DU}(v,\langle i,j\rangle)$".

P. 595: In the first table, reorder the lines so the lines for "`i`" occur first, followed by the lines for "`j`", etc., as in the second table.

Pp. 596–597: Make the table at the bottom of p. 596 part **(a)** of Figure 18.21 on p. 597, label the existing part of the figure as part "**(b)**", and change the word "The" in the caption to "(a) The `Mark` table after identfiying dead code and (b) the".

P. 601: In line 9, change "store" to "store with increment".

Chapter 19. Interprocedural Analysis & Optimization

In each of the following contexts, replace occurrences of "`pinsts`" by "`numinsts`" with the same declaration (or, if it is a procedure parameter, with the qualifier "`in`"):

P. 611, Figure 19.3
P. 612, Figure 19.5
P. 616, the second numbered item 2
P. 639, Figure 19.21 *(continued)*, line 3
P. 645, Figure 19.26, line 14
P. 647, Figure 19.28, line 15
P. 649, Figure 19.30, line 17

P. 613–614: Move the first 5 lines of Figure 19.7 on p. 614 to the beginning of Figure 19.6 on p. 613.

P. 631: In line 16 of Figure 19.18, change “)<Dfn” to “) < Dfn”, and, in line 2 of the footnote, delete “, neither of which calls the other”.

P. 639: In line 1 of the text, delete the word “as”.

p. 647, Figure 19.28: In line 1, delete “R,”; in line 3, change “, R:” to “:”; in line 20, change “nonlocals variable” to “nonlocal variables”; and, in line –9, delete “R,”.

P. 650: In Figure 19.31, change all of “p”, “u”, “v”, “q”, “r”, “w”, “x”, and “y” to be italic, and change “v in A(w)” to “$v \in A(w)$”. In line -2 of the text, change “procedure given” to “procedure(s) given”.

P. 652, Figure 19.33: In line 8, change “v: Var” to “u, v, w, x, y: Var”.

Chapter 20. Optimization for the Memory Hierarchy

P. 676, Figure 20.4: In line -1 of the text, change “could” to “can”.

P. 678: In line -3 of the first paragraph, change “basic blocks” to “nodes (i.e., basic blocks)” and “block” to “node”, and, in line -3 of the next to last paragraph, change “block” to node”.

P. 679. Figure 20.6: Change all 13 occurrences of “Block” to “Node”; in line 10, change “c1, c2, c3” to “c, c1, c2”; and, in line 20, change “blocks” to “nodes”.

P. 680, Figure 20.6 *(continued)*: In lines -13 and -12, change the three occurrences of “Block” to “Node”.

p. 683: In line 2 of the text, insert “or equal to” after “than”.

P. 686, Figure 20.15: In lines 1–3, change all three occurrences of “=” to “←”.

P. 695, Figure 20.26: In lines 3 and 4, change both occurrences of “=” to “←”.

Chapter 21. Case Studies of Compilers and Future Trends

P. 708: In line 9 of the text, change “compares and branches” to “and compares”.

P. 739, Figure 21.21: In lines 8–10, move each opcode left one space.

Appendix A. Guide to Assembly Languages Used in This Book

P. 754: In line 7 of the text, change “, compare” to “(compare”; in line 8, change “respectively” to “respectively)”; and, in Table A.10, insert an entry after “COMBF” as follows: “COMCLR   compare and clear”.

Appendix B. Representations of Sets, Sequences, Trees, DAGs, and Functions

P. 760, Figure B.2: Move lines -3 and -2 left three spaces.

Bibliography

P. 801, entry [Ahal93]: Change "[Ahal93]" to "[AhaL93]".

P. 804, entry [BriT94]: Change "[BriT94]" to "[BriT93]".

P. 812, entry [Kuck74]: In the second line, change "1964" to "1974".

Technical Index

P. 821: In the entry for "`append_preheader( )`", delete page reference "437"; and, in the entry for "`Block`", delete page reference "560".

P. 822: In the entry labeled "Eval( )", change "Eval( )" to "`Eval( )`" and change the text "sparse conditional constant propagation" to dominator computation"; also, change "EVAL( )" to "*Eval*( )".

P. 823: Add the entry "*idom*( ), 182".

P. 824: In the entry for "`L`^{F}", change the entry to "`L`$^{\mathtt{F}}$"; add the entries "`LL( )`, 196", "`LLend( )`, 196", and "*pdom*( ), 182". Change the "`new_temp( )`" entry to have "346, " inserted as its first citation; the "*numinsts*( )" entry to have the citation "620" in place of "610"; and delete the "620" citation for the "`numinsts( )`" entry.

P. 825: Replace the "`Post_Order( )`" entry by the following:

`Post_Order( )`
  in computing dominance frontiers, 254
  in instruction scheduling, 539

replace the "`Replace( )`" entry by the following:

`Replace( )`
  in Graham-Glanville code generation, 154
  in structural control-flow analysis, *210*, 210

and add the entry "*sdom*( ), 182".

Also, add the following:

`arybinasgn`, 87	`aryref`, 87	`aryunasgn`, 87	`aryvalasgn`, 87	`binasgn`, 83
`binexp`, 85	`binif`, 83	`bintrap`, 83	`call`, 83	`callasgn`, 84
`callreg`, 89	`callreg2`, 89	`callreg3`, 90	`callregasgn`, 90	`castasgn`, 83
`condasgn`, 83	`const`, 84, 90	`else`, 87	`eltasgn`, 83	`endif`, 87
`goto`, 83, 89	`gotoaddr`, 89	`indasgn`, 83	`indeltasgn`, 83	`label`, 83, 89
`listexp`, 85	`loadmem`, 89	`noexp`, 85	`receive`, 83	`regbin`, 89
`regbinif`, 89	`regvalif`, 89	`regbintrap`, 89	`regvaltrap`, 89	`regcond`, 89
`regelt`, 89	`regun`, 89	`regunif`, 89	`reguntrap`, 98	`regval`, 89
`return`, 84, 90	`retval`, 84, 90	`sequence`, 84, 90	`strbinif`, 87	`strunif`, 87
`strvalif`, 87	`stormem`, 89	`type`, 84, 90	`unasgn`, 83	`unexp`, 85
`unif`, 83	`untrap`, 83	`valasgn`, 83	`valif`, 83	`valtrap`, 83

Subject Index

P. 829: Insert the two entries "abstract nodes, 198" and "acyclic test, 284".

P. 830: Insert the entry "ancestor, 185".

P. 831: In the entry for "Auslander, Mark", change "494" to "804". In the entry for "back edges", change "defined" to "in depth-first presentation" and append the subentry "in natural loops, 191".

P. 832: Insert the four entries "block schema, 203"; "bottom-up rewriting systems (BURS), 165"; "branch node, 175"; and "BURS, 165".

P. 833: Insert the entry "case/switch schema, 203" and, under "code hoisting", the subentry "control-flow analysis and, 175". Change the "494" page reference for both the "Chandra, Ashok" and "Cocke, John" entries to "804".

P. 834: Insert the two entries "constraint matrix test, 284" and "control-tree-based data-flow analysis, 236–251" and, under "control-flow analysis", the subentries "branch node, 175", "join node, 175", "predecessors of a node, 175", and "succecessors of a node, 175". In the "*See also*" section under "control-flow analysis", change "interprocedural" to "flowgraphs *and* interprocedural".

P. 835: In the "data-flow analysis" entry, add to the "backward" subentry the page references ", 244–247" and add to the "forward" subentry the page references ", 236–244".

P. 836: Add the entry "Delta test, 284" and, in the "dominators" entry, add the subentries "postdominators, 182" and "strict dominators, 182".

P. 837: Add the entry "extended GCD test, 283" and, in the "elimination methods" entry, add the page reference "173," to the "interval control-flow analysis" subentry.

P. 838: Add the entry "Fourier-Motzkin test, 284" and, in the "forward substitution" entry, change "395" to "396". In the entry for "forward substitution", change the page reference to "396".

P. 839: Add the entries "Groves, Randy, 807", "heuristics for register spilling *See* register allocation by graph coloring", and "high-level data-flow analysis, 202". Add to the "global common-subexpression elimination" entry the subentry "control-flow anaysis and, 175". Change several page references, as follows: for "Gao, G.R.", change "567" to "817"; for "Geschke, Charles, M.", change "730" to "820"; for "Goldin, Dina Q.", change "521" to "803"; for Golumbic, Martin C.", change "521, 548" to "548, 803"; for "Graham, Susan L.", insert "vli–ix" before "52"; and for "Hall, Mary W.", change "469" to "806". Also, change the entry "Gupta, Rjiv" to "Gupta, Rajiv".

P. 840: Change the page reference for "Hobbs, Steven O." from "730" to "820". Also, insert the following entry: "improper intervals or regions, 196, 203, 240–241".

P. 842: Add the entry "join node, 175". Add to the "irreducibility" entry the subentry "*See also* improper intervals". Change the page reference for "Johnsson, Richard K.", from "730" to "820".

P. 843: In the "Kleene closure" entry, change "functions" to "functions,". Change the page references for "Krawczyk, Hugo," from "512" to "803"; and for "Lichtenstein, W." from "567" to "817". For the "Lewis, Harry R." entry, add the page reference ", 729". In the "lattices" entry, delete from the "distributivity" subentry the "236" page reference. Split the "lattices" entry into two, one for "lattices" and the second for "lattices of monotone flow functions"; In the former, add a "strongly distibutive, 236" subentry.

To form the "lattices of monotone flow functions" entry, delete the corresponding subentry from the "lattices" entry, and begin the new entry with the page references "235–236", move the "composition operator", "effective height", "fixed points", and "Kleene closure" subentries from the "lattices" entry to the new one, and add subentries as follows: "identity function (*id*), 235", and "nonempty closure operator, unary postfix ($^+$), 235".

P. 845: In the "loops" entry (which begins on p. 844) add a "headers, 191" subentry. In the "Mansour, Yishay" entry, change "521" to "803"; and in the "McKinley, K.S." and "Mellor-Crummey, J.M." entries, change the page reference "637" to "806".

P. 846: In the "Morel, Etienne" entry, add the page reference ", 422"; and in the "Nahshon, Itai" entry, change "521" to "803". In the "number notations" entry, delete the words "in this book". Add the following five entries: "natural loop schema, 203"; "nested regions, 198"; "node splitting, 197"; "nullification, *see* branch scheduling"; and "Omega test, 284".

P. 847: Change the page reference in the "Pinter, Ron Y." entry from "521" to "803". Add two entries, as follows: "path strings, 163", and "Pelegri-Llopart, Eduardo, 165".

P. 848: Add two entries, as follows: "postdominators, 182", and "power test, 284".

P. 849: Add two entries, as follows: "proper ancestor, 185", and "region, 175".

P. 850: In the "register allocation by graph coloring" entry, add the subentry "heuristics used in register spilling, 501, 522–523". Add a page reference to each of the following three entries: to "register pressure", add "407"; to "Reif, John R." add "729"; and to "Renvoise, Claude" add "422".

P. 851: Delete from the "Rogers, Anne" entry the page reference ", 768".

P. 852: Add the following three entries: "Silberman, Gabriel, 807"; and "Simple Loop Residue test, 284"; "single-valued, 34"; "SIV tests, 283".

P. 853: Add to the "spill costs computation" entry the subentry "heuristics, *see* register allocation by graph coloring". Add the two entries "strict dominance, 182" and "strongly distributive, 236". Change the page reference for "Stoutchinin, A." from "567" to "817".

P. 855: Add the two entries "uniform register machine, 163" and "unrolling, *see* loop unrolling".

P. 856: Add the entry "Ziv, Isaac, 807". Change "Weiker" to "Weicker". Change the page reference in the "Warren, S.K." entry from "637" to 806" and in the "Weinstock, Charles R." entry, from "730" to "820".