

Table of Figures

Figure 1-1: Cell numbering	1
Figure 1-2: Partially solved Sudoku	3
Figure 1-3: Box IDs	4
Figure 2-1: An easy Sudoku	17
Figure 2-2: A naked pair	18
Figure 2-3: A hidden pair	18
Figure 2-4: A box-line configuration	19
Figure 2-5: A pointing-line configuration	19
Figure 2-6: Y-wing row+column	21
Figure 2-7: Y-wing line+box	21
Figure 2-8: Lines-2 (columns)	23
Figure 2-9: XY-chain 1	24
Figure 2-10: XY-chain 2	25
Figure 2-11: XY-chain 3	25
Figure 2-12: Chain with redundant cells	26
Figure 2-13: The rectangle strategy	27
Figure 2-14: A full rectangle	27
Figure 2-15: A not-hollow rectangle	28
Figure 2-16: A rectangle with something more	28
Figure 2-17: Lines-3 (rows)	29
Figure 2-18: Lines-3 possibilities	30
Figure 3-1: Eclipse – New Project	34
Figure 3-2: Eclipse – New Java Project	35
Figure 3-3: Eclipse – Sudoku string as the first argument	36
Figure 5-1: ‘unique’ within a row	63
Figure 5-2: ‘unique’ within a box	66
Figure 6-1: Box with naked pairs	74
Figure 6-2: Box with naked triples	75
Figure 7-1: Box with hidden pairs	85
Figure 7-2: Listing cells per candidate digit	86
Figure 8-1: An example for ‘box-line’	93
Figure 9-1: An example for ‘pointing-line’	97
Figure 10-1: An example for ‘lines-2’	108
Figure 11-1: An example for ‘Y-wing’	124
Figure 11-2: An example for ‘XY-chain’	133
Figure 12-1: Patterns for the ‘rectangle’ strategy	141
Figure 12-2: An example for ‘rectangle’	146
Figure 12-3: ‘pointing-line’ within ‘rectangle’	151
Figure 13-1: The hardest Sudoku	154
Figure 13-2: The hardest analytical Sudoku	154

viii Table of Figures

Figure 13-3: A hard Sudoku - 1	159
Figure 13-4: A hard Sudoku - 2	161
Figure 14-1: Nicely formatted puzzle	165
Figure 14-2: A puzzle as seen in a web browser	169
Figure 15-1: Box IDs (repeated)	184
Figure 15-2: A failed fillDigit()	186
Figure 15-3: Examples of symmetric quadruplets of cells	189
Figure 15-4: Examples of symmetric pairs of cells	190
Figure 15-5: A puzzle to solve with brute()	208
Figure 16-1: Distribution of the number of clues	216
Figure 16-2: A puzzle with 41 clues	217
Figure 16-3: A puzzle with 25 clues	217
Figure 16-4: Missing 6 and solved 1	218
Figure 16-5: Usage of strategies - 1	220
Figure 16-6: The Solver applies 'line-4'	221
Figure 16-7: Usage of strategies - 2	222
Figure 16-8: Frequency of strategy levels	222
Figure 16-9: Puzzle #2 with 25 clues	224
Figure 16-10: Shifting digits	225
Figure 16-11: Puzzle #3 with 25 clues	225
Figure 16-12: Puzzle #4 with 25 clues	226
Figure 17-1: A diamond Sudoku	230
Figure 17-2: A cross Sudoku	231
Figure 17-3: A smiley Sudoku	232
Figure 17-4: A heart Sudoku	233
Figure 17-5: A wave Sudoku	233
Figure 17-6: An asterisk Sudoku	234
Figure 18-1: A Samurai Sudoku	235
Figure 18-2: Central grid (Sudoku 4)	236
Figure 18-3: Initial top-left grid (Sudoku 0)	237
Figure 18-4: Modified top-left grid (Sudoku 0)	238
Figure 18-5: The first Samurai	239