

Contents

1	Consecutive Numbers	1
1.1	Which Numbers Are Possible?	1
1.2	What Anne and Bill Know	4
1.3	Informative Announcements	6
1.4	Versions	8
1.5	History	9
2	Hangman	13
2.1	How to Guard a Secret?	13
2.2	A Bridge Too Far	16
2.3	Versions	18
2.4	History	19
3	Muddy Children	21
3.1	Muddy or Not Muddy, That is the Question	21
3.2	Simultaneous Actions	24
3.3	Versions	29
3.4	History	31
4	Monty Hall	33
4.1	What Is the Best Question to Ask?	33
4.2	Why Is It to Your Advantage to Switch Doors?	36
4.3	Versions	37
4.4	History	38
5	Russian Cards	39
5.1	You Had Better Know What You Say	39
5.2	Knowing What Another Player Knows	46
5.3	Solution of the Problem	48
5.4	Versions	51
5.5	History	52

6	Who Has the Sum?	55
6.1	A Binary Tree of Uncertainty	55
6.2	Informative Announcements	58
6.3	The Solution	60
6.4	Versions	62
6.5	History	63
7	Sum and Product	65
7.1	Introduction	65
7.2	I Know That You Do Not Know It	67
7.3	I Knew You Did Not Know	68
7.4	Solution of Sum and Product	70
7.5	Versions	75
7.6	History	76
8	Two Envelopes	79
8.1	High Expectations	79
8.2	A Subtle Error	81
8.3	Versions	82
8.4	History	82
9	One Hundred Prisoners and a Light Bulb	83
9.1	How to Count to a Hundred with Only 1 Bit?	83
9.2	One Prisoner	85
9.3	Two Prisoners	85
9.4	A Protocol for Three Prisoners?	85
9.5	No Tricks	87
9.6	Solution for One Hundred Prisoners	88
9.7	Versions	89
9.8	History	94
10	Gossip	95
10.1	Gossip Protocols	95
10.2	How to Know Whom to Call	99
10.3	Knowledge and Gossip	101
10.4	Versions	106
10.5	History	107
11	Cluedo	109
11.1	Introduction	109
11.2	I Do not Have These Cards	112
11.3	Showing a Card	113
11.4	I Cannot Win	114
11.5	How to Win Cluedo—Once	116
11.6	Versions	120
11.7	History	121

12	Overview of Dynamic Epistemic Logic	123
12.1	Introduction	123
12.2	Epistemic Logic	123
12.3	Multiagent Epistemic Logic	128
12.4	Common Knowledge	130
12.5	Public Announcements	132
12.6	Unsuccessful Updates	140
12.7	Epistemic Actions	144
12.8	Belief Revision	149
12.9	Beyond Dynamic Epistemic Logic	152
12.10	Historical Notes	152
13	Answers	157
13.1	Answers to Puzzles from Chapter 1	157
13.2	Answers to Puzzles from Chapter 2	160
13.3	Answers to Puzzles from Chapter 3	160
13.4	Answers to Puzzles from Chapter 4	165
13.5	Answers to Puzzles from Chapter 5	166
13.6	Answers to Puzzles from Chapter 6	170
13.7	Answers to Puzzles from Chapter 7	172
13.8	Answers to Puzzles from Chapter 8	174
13.9	Answers to Puzzles from Chapter 9	174
13.10	Answers to Puzzles from Chapter 10	177
13.11	Answers to Puzzles from Chapter 11	180
	References	183

One Hundred Prisoners and a Light Bulb

van Ditmarsch, H.; Kooi, B.

2015, IX, 188 p. 24 illus., Softcover

ISBN: 978-3-319-16693-3