

Part I Basics

1	Set-Up	3
1.1	Introduction	3
1.2	Structure of This Book	4
1.3	Obtaining R	5
1.4	Supplemental Materials	5
1.5	Getting Help with R	5
	References	6
2	A Short Introduction to R	7
2.1	Introduction	7
2.2	Calculator and Objects	7
2.3	Numeric Vectors	9
2.4	Logical Vectors	11
2.5	Subsetting	12
2.6	Character Vectors	14
2.7	Matrices and Data Frames	16
2.8	Data I/O	19
2.9	Advanced Subsetting	22
	References	24
3	EDA I: Continuous and Categorical Data	25
3.1	Introduction	25
3.2	Tables	26

3.3	Histogram	29
3.4	Quantiles	31
3.5	Binning	35
3.6	Control Flow	37
3.7	Combining Plots	40
3.8	Aggregation	42
3.9	Applying Functions	44
	References	46
4	EDA II: Multivariate Analysis	47
4.1	Introduction	47
4.2	Scatter Plots	47
4.3	Text	50
4.4	Points	53
4.5	Line Plots	54
4.6	Scatter Plot Matrix	58
4.7	Correlation Matrix	60
5	EDA III: Advanced Graphics	63
5.1	Introduction	63
5.2	Output Formats	63
5.3	Color	65
5.4	Legends	70
5.5	Randomness	71
5.6	Additional Parameters	76
5.7	Alternative Methods	77
	References	78

Part II Humanities Data Types

6	Networks	81
6.1	Introduction	81
6.2	A Basic Graph	81
6.3	Citation Networks	84
6.4	Graph Centrality	87
6.5	Graph Communities	90
6.6	Further Extensions	92
	References	93
7	Geospatial Data	95
7.1	Introduction	95
7.2	From Scatter Plots to Maps	96
7.3	Map Projections and Input Formats	100
7.4	Enriching Tabular Data with Geospatial Data	105
7.5	Enriching Geospatial Data with Tabular Data	107

7.6 Further Extensions	110
References	110
8 Image Data	113
8.1 Introduction	113
8.2 Basic Image I/O	113
8.3 Day/Night Photographic Corpus	117
8.4 Principal Component Analysis	120
8.5 K-Means	123
8.6 Scatter Plot of Raster Graphics	126
8.7 Extensions	127
References	129
9 Natural Language Processing	131
9.1 Introduction	131
9.2 Tokenization and Sentence Splitting	132
9.3 Lemmatization and Part of Speech Tagging	134
9.4 Dependencies	138
9.5 Named Entity Recognition	143
9.6 Coreference	145
9.7 Case Study: Sherlock Holmes Main Characters	148
9.8 Other Languages	150
9.9 Conclusions and Extensions	152
References	153
10 Text Analysis	157
10.1 Introduction	157
10.2 Term Frequency: Inverse Document Frequency	157
10.3 Topic Models	162
10.4 Stylometric Analysis	167
10.5 Further Methods and Extensions	174
References	175

Part III Appendix

11 R Packages	179
11.1 Installing from Within R	179
11.2 rJava	181
11.3 coreNLP	181
11.4 sessionInfo	182
12 100 Basic Programming Exercises	183
13 100 Basic Programming Solutions	193