



From *Mastering the SAS DS2 Procedure*.
Full book available for purchase [here](#).

Contents

Dedication	iii
Foreword	ix
About This Book	xi
About the Author	xv
Chapter 1: Getting Started	1
1.1 Introduction.....	1
1.1.1 What is DS2?	1
1.1.2 Traditional SAS DATA Step versus DS2	2
1.1.3 What to Expect from This Book.....	6
1.1.4 Prerequisite Knowledge.....	7
1.2 Accessing SAS and Setting Up for Practice.....	7
Chapter 2: Introduction to the DS2 Language	9
2.1 Introduction.....	9
2.2 DS2 Programming Basics.....	9
2.2.1 General Considerations.....	9
2.2.2 Program Structure	11
2.2.3 Procedure Options and Global Statements	12
2.2.4 Program Blocks.....	18
2.2.5 Methods	19
2.2.6 User-Defined Methods	21
2.2.7 Variable Identifiers and Scope.....	25
2.2.8 Data Program Execution	30
2.3 Converting a SAS DATA Step to a DS2 Data Program	31
2.3.1 A Traditional SAS DATA Step	31
2.3.2 Considerations	31
2.3.3 The Equivalent DS2 Data Program.....	32
2.3.4 More Complex Data Program Processing	32
2.3.5 Automatic Conversion with PROC DSTODS2.....	33
2.4 Review of Key Concepts.....	35

Chapter 3: DS2 Data Program Details	37
3.1 Introduction	37
3.2 DS2 Data Programs versus Base SAS DATA Steps	37
3.2.1 General Considerations	37
3.2.2 The Seven Subtle Dissimilarities.....	40
3.2.3 DS2 “Missing” Features	55
3.3 Data Types in DS2.....	61
3.3.1 DS2 and ANSI Data Types	61
3.3.2 Automatic Data Type Conversion	62
3.3.3 Non-coercible Data Types	64
3.3.4 Processing SAS Missing and ANSI Null Values.....	66
3.4 Review of Key Concepts	71
Chapter 4: User-Defined Methods and Packages	73
4.1 Introduction	73
4.2 Diving into User-Defined Methods	74
4.2.1 Overview.....	74
4.2.2 Designing a User-Defined Method	74
4.3 User-Defined Packages.....	79
4.3.1 General Considerations	79
4.3.2 User-Defined Package Specifics	79
4.4 Object-Oriented Programming with DS2 Packages.....	84
4.4.1 General Considerations	84
4.4.2 Designing an Object.....	84
4.4.3 Using Objects as Building Blocks.....	93
4.4 Review of Key Concepts	96
Chapter 5: Predefined Packages	99
5.1 Introduction	99
5.2 Executing FCMP Functions in DS2	100
5.2.1 The FCMP Package	100
5.2.2 FCMP Package Example	101
5.3 The Hash and Hiter (Hash Iterator) Packages	106
5.3.1 General	106
5.3.2 Hash Package Example	106
5.3.3 Hash Iterator Package Example	109
5.4 The HTTP and JSON Packages	111
5.4.1 General	111

5.4.2 HTTP Package Specifics	112
5.4.3 JSON Package Specifics.....	116
5.4.4 HTTP and JSON Packages Example.....	120
5.5 The Matrix Package	124
5.5.1 General.....	124
5.5.2 Matrix Package Example.....	127
5.6 The PCRXFIND and PCRXREPLACE Packages	129
5.6.1 General.....	129
5.6.2 PCRXFIND and PCRXREPLACE Package Examples	131
5.7 The SQLSTMT Package	134
5.7.1 General.....	134
5.7.2 SQLSTMT Package Example	136
5.8 The TZ (Time Zone) Package	142
5.8.1 General.....	142
5.8.2 TZ Package Example	143
5.9 Review of Key Concepts.....	144
Chapter 6: Parallel Processing in DS2.....	145
6.1 Introduction.....	145
6.2 Understanding Threaded Processing.....	146
6.2.1 The Need for Speed	146
6.2.2 Loading Data to and from RAM.....	146
6.2.3 Manipulating Data in RAM	146
6.3 DS2 Thread Programs.....	147
6.3.1 Writing DS2 Thread Programs.....	147
6.3.2 Parallel Processing Data with DS2 Threads.....	149
6.4 DS2 and the SAS In-Database Code Accelerator	152
6.4.1 DS2 Program In-Database Processing	152
6.5 DS2 and SAS® Viya® and SAS Cloud Analytic Services (CAS)	153
6.5.1 A Brief Introduction to SAS Viya and CAS.....	153
6.5.2 Running DS2 Programs in CAS	153
6.6 Review of Key Concepts.....	160
Chapter 7: Performance Tuning in DS2	161
7.1 Introduction.....	161
7.2 DS2_OPTIONS Statement.....	162
7.2.1 TRACE Option	162
7.3 Analyzing Performance with the SAS Log	163
7.3.1 Obtaining Performance Statistics	163

7.3.2 Analyzing Performance Statistics.....	164
7.3.3 Tuning Your Code.....	165
7.4 Learning and Troubleshooting Resources.....	165
 7.4.1 SAS Learning Resources	165
 7.4.2 SAS Support Communities	166
 7.4.3 SAS Technical Support	166
7.5 Review of Key Concepts	167
7.6 Connecting with the Author	167
Index	169

From *Mastering the SAS® DS2 Procedure: Advanced Data-Wrangling Techniques, Second Edition* by Mark Jordan.
Copyright © 2018, SAS Institute Inc., Cary, North Carolina, USA. ALL RIGHTS RESERVED.