

Contents

About This Book	vii
About The Author	xi
Acknowledgments	xiii
Preface	xv
Chapter 1: An Overview of Hash Objects	1
What Are Hash Objects?	2
Introducing a Simple Hash Object Application	2
Chapter 2: Hash Object Terminology and Concepts	7
What Is a SAS Hash Object?	7
Defining Terms Associated with Hash Objects	8
Writing Code That Works with Hash Objects.....	9
Understanding How SAS Stores Hash Objects in Memory	10
Understanding How Long Hash Objects Persist	11
Specifying the Contents of Hash Objects.....	11
Initializing Variables in a DATA Step That Contains a Hash Object.....	14
Illustrating How the Program Data Vector Connects DATA Step Variables and Hash Object Items	15
Chapter 3: Basic Hash Object Applications	25
Using a Hash Object As a Lookup Table	26
Defining a Hash Object.....	26
Finding Key Values in a Hash Object	28
Defining the Key Structure in a Hash Object	30
Understanding How the FIND and CHECK Methods Alter the Values of DATA Step Variables and Hash Object Data Items	30
Application Example: Verifying Presence of Key Values	33

Application Example: Returning Data Items from a Hash Object.....	36
Application Example: Defining the Key Value During Processing of the DATA Step.....	39
Application Example: Searching for a Key Value in Multiple Hash Objects.....	41
Application Example: Combining Data from Multiple Sources	44
Using Multiple Key Items to Look Up Data	49
Traversing Hash Objects	53
Specifying a Hash Iterator Object	53
Understanding the Methods That Control Traversal of a Hash Object.....	54
Illustrating How the Hash Iterator Object Traverses a Hash Object	55
Application Example: Traversing a Hash Object from Beginning to End.....	59
Application Example: Linking Hierarchically Related Data Sets.....	62
Application Example: Performing a Fuzzy Merge Using a Hash Iterator Object.....	66
Chapter 4: Creating Data Sets from Hash Objects and Updating	
Contents of Hash Objects	71
Creating a Data Set from a Hash Object	72
Adding, Modifying, and Removing Data from a Hash Object.....	73
Defining the Key Structure in a Hash Object	74
Understanding How to Specify the KEY and DATA Argument Tags	75
Identifying the Variables That the OUTPUT Method Writes to a Data Set	77
Understanding the Interaction between DATA Step Variables and Hash Object	
Data Items When Replacing Data in a Hash Object.....	78
Replacing Key Item Values When a Key Item Is Also a Data Item.....	80
Comparing the DATA Statement and the OUTPUT Method	83
Application Example: Finding the Unique Values of a Variable in a Data Set.....	87
Application Example: Ordering Observations by Variables Not Saved to a Data Set	
Created from a Hash Object	90
Application Example: Using Hash Objects to Apply Transactions to	
Master Data Sets—Part 1	92
Application Example: Using Hash Objects to Apply Transactions to	
Master Data Sets—Part 2.....	97
Application Example: Summarizing Data with the Hash Iterator Object	102
Application Example: Summarizing Hierarchically Related Data	106

Chapter 5: Hash Objects with Multiple Sets of Data Items per Key Value	113
Understanding the Concepts of Duplicate Key Values and Multiple Sets of Data Items per Key Value in a Hash Object	114
Defining Hash Objects That Process Multiple Sets of Data Items per Key Value.....	115
Illustrating How the MULTIDATA and DUPLICATE Argument Tags Affect Hash Object Processing.....	117
Understanding the Methods That Look for Multiple Sets of Data Items per Key	121
Understanding How SAS Stores Multiple Sets of Data Items per Key	123
Comparing Retrieval of Data from a Hash Object That Allows Multiple Sets of Data Items per Key Value to a Hash Iterator Object	123
Modifying Data in a Hash Object That Allows Multiple Sets of Data Items per Key Value	129
Summarizing Data in Hash Objects That Allow Multiple Sets of Data Items per Key Value	143
Application Example: Summarizing and Sorting a Data Set.....	144
Application Example: Creating Data Sets Based on a Series of Observations	147
Application Example: Creating a Data Set That Contains All Combinations of Specific Variables When the Number of Combinations Is Large.....	151
Application Example: Linking Hierarchically Related Data Using a Hash Object That Allows Multiple Sets of Data Items per Key Value	154
Chapter 6: Managing Hash Objects	159
Creating, Deleting, and Clearing Hash Objects During Execution of a DATA Step	159
Determining the Number of Items in a Hash Object	164
Application Example: Creating a Data Set for Each BY Group	166
Comparing Two Hash Objects.....	170
Specifying Memory Structure Usage of a Hash Object	174
Determining the Size of an Entry in a Hash Object	174
Index	181

