

Paper CC-018

Exploring the Undocumented PROC SQL _METHOD Option

Kirk Paul Lafler, Software Intelligence Corporation

Abstract

The SQL Procedure contains many powerful and elegant language features for SQL users to take advantage of. This paper explores the _METHOD option as an applications development and tuning tool. Attendees will learn how to use this undocumented and powerful option to better understand and control how a query processes.

Keywords: SQL, PROC SQL, _METHOD, undocumented, join algorithms

Introduction

PROC SQL supports a powerful “undocumented” option called **_METHOD**. Although undocumented features like the _METHOD option should be used with caution, SAS users may find this option to provide far greater value than risk. In fact, the _METHOD option is worth exploring because of the benefits related to gaining a better understanding of the processes during specific PROC SQL operations, including complex table joins and subqueries.

PROC SQL Join Algorithms and the _METHOD Option

When it comes to performing PROC SQL joins, users supply the names of the tables for joining along with the join conditions, and the PROC SQL optimizer determines which of the available join algorithms to use for performing the join operation. There are three algorithms used in the process of performing a join:

- ✓ **Nested Loop Join** – When an equality condition is not specified, a read of the complete contents of the right table is processed for each row in the left table.
- ✓ **Merge Join** – When the tables specified are already in the desired sort order, resources will not need to be extended to rearranging the tables.
- ✓ **Hash Join** – When an equality relationship exists, the smaller of the tables is able to fit in memory, no sort operations are required, and each table is read only once.

Application of the _METHOD Option

The PROC SQL _METHOD option can be used as an effective way to analyze a query process as well as for debugging purposes. Information from using the _METHOD option is displayed on the Log using a variety of codes. The codes and their corresponding descriptions associated with the _METHOD option appear in the table below.

Code	Description
SQXCRTA	Create table as Select.
SQXSLCT	Select statement or clause.
SQXJSL	Step loop join (Cartesian).
SQXJM	Merge join operation.
SQXJNDX	Index join operation.
SQXJHSH	Hash join operation.
SQXSORT	Sort operation.
SQXSRC	Source rows from table.
SQXFIL	Rows filtration.
SQXSUMG	Summary stats (aggregates) with GROUP BY clause.
SQXSUMN	Summary stats with no GROUP BY clause.

In the following example a `_METHOD` option is specified to show the processing hierarchy in a two-way equi-join.

SQL Code

```
PROC SQL _METHOD;  
  SELECT MOVIES.TITLE, RATING, ACTOR_LEADING  
  FROM MOVIES, ACTORS  
  WHERE MOVIES.TITLE = ACTORS.TITLE;  
QUIT;
```

Results

```
NOTE: SQL execution methods chosen are:  
      sqxslct  
      sqxjsh  
      sqxsrc( MOVIES )  
      sqxsrc( ACTORS )
```

Conclusion

The SQL Procedure's `_METHOD` option provides a powerful and elegant language feature for users to take advantage of to help better understand complex operations such as joins, subqueries, and other processes.

References

- Lafler, Kirk Paul (2007), *"Undocumented and Hard-to-Find PROC SQL Features,"* Proceedings of the 2007 NorthEast SAS Users Group (NESUG) Conference, Software Intelligence Corporation, Spring Valley, CA, USA.
- Lafler, Kirk Paul (2007), *"Undocumented and Hard-to-Find PROC SQL Features,"* Proceedings of the 2007 PharmaSUG Conference, Software Intelligence Corporation, Spring Valley, CA, USA.
- Lafler, Kirk Paul (2006), *"A Hands-on Tour Inside the World of PROC SQL,"* Proceedings of the 31st Annual SAS Users Group International Conference, Software Intelligence Corporation, Spring Valley, CA, USA.
- Lafler, Kirk Paul (2004). *PROC SQL: Beyond the Basics Using SAS*, SAS Institute Inc., Cary, NC, USA.
- Lafler, Kirk Paul (2003), *"Undocumented and Hard-to-find PROC SQL Features,"* Proceedings of the 2007 Western Users of SAS Software (WUSS) Conference, Software Intelligence Corporation, Spring Valley, CA, USA.
- Lafler, Kirk Paul (2002). *PROC SQL Programming Tips*; Software Intelligence Corporation, Spring Valley, CA, USA.

Trademark Citations

SAS and all other SAS Institute Inc. product or service names are registered trademarks or trademarks of SAS Institute Inc. and other countries. ® indicates USA registration.

Acknowledgments

I would like to thank Erik Larsen and Gary Schlegelmilch, SESUG 2008 Coders' Corner Section Chairs for asking me to prepare and present this paper, as well as Peter Eberhardt, Conference Academic Chair and Jennifer Waller, Conference Operations Chair for a great conference!

Author Bio

Kirk Paul Lafler is consultant and founder of Software Intelligence Corporation and has been using SAS since 1979. Kirk provides IT consulting services and training to SAS users around the world. As a SAS Certified Professional, Kirk has written four books including *PROC SQL: Beyond the Basics Using SAS*, and more than two hundred peer-reviewed articles. He has also been an Invited speaker and instructor at more than two hundred SAS International, regional, local, and special-interest user group conferences and meetings throughout North America. His popular SAS Tips column, "Kirk's Korner of Quick and Simple Tips", appears regularly in several SAS User Group newsletters and Web sites, and his fun-filled SASword Puzzles is featured in SAScommunity.org. Kirk can be reached at:

Software Intelligence Corporation
World Headquarters
P.O. Box 1390
Spring Valley, California 91979-1390
E-mail: KirkLafler@cs.com