

200-2013 Exploring the PROC SQL _METHOD Option

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Abstract

The SQL Procedure contains powerful options for users to take advantage of. This presentation and poster explores the fully supported _METHOD option as an applications development and tuning tool, and learn how to use this powerful option to understand and control how a query processes.

Introduction

PROC SQL supports a powerful option called _METHOD. Since its implementation, many SAS® SQL users have expressed very favorable comments for the value-added information it provides on the SAS Log. In fact, the _METHOD option is worth exploring simply due to the benefits associated with gaining a better understanding of the processes during specific PROC SQL operations, query evaluation, algorithm selected and used by the optimizer the processing of a query, or testing and debugging operations.

The _METHOD Option and Code Descriptions

Code	Description
SQXCRTA	Create table as Select.
SQXSLCT	Select statement or clause.
SQXJSL	Step loop join (Cartesian).
SQXJUM	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.

MSGLEVEL=I

Users can control how much information the SAS System writes to the SAS log by specifying MSGLEVEL= in an Options statement. The MSGLEVEL= option supports two possible values: **N** (default) to print standard notes, warnings, and error messages; and **I** to print standard notes, warnings, error messages, plus information about sort, merge, and index processing.

OPTIONS MSGLEVEL=I;
PROC SQL;
 SELECT M.TITLE, RATING, LENGTH, ACTOR_LEADING
 FROM MOVIES M, ACTORS A
 WHERE M.TITLE = A.TITLE AND RATING = 'PG';
QUIT;

SQL Code

OPTIONS MSGLEVEL=I;
PROC SQL;
 SELECT M.TITLE, RATING, LENGTH, ACTOR_LEADING
 FROM MOVIES M, ACTORS A
 WHERE M.TITLE = A.TITLE AND RATING = 'PG';
INFO: Index Rating selected for WHERE clause optimization.
QUIT;

Log Results

Join Algorithms

The SQL optimizer determines which of four join algorithms to use for performing join query operations. The four algorithms include:

Nested Loop – Selected by the optimizer when a Sort-Merge, Index and Hash algorithm is eliminated from consideration.

Sort-Merge – Selected by the optimizer when a Index and Hash algorithm is eliminated from consideration.

Index – Selected by the optimizer when a user-defined index will improve performance.

Hash – Selected by the optimizer when the smaller of the tables can fit into available memory.

_METHOD Option

A _METHOD option is specified to show the processing hierarchy in a two-way equi-join. As illustrated, the SQL optimizer selected a hash join algorithm for the join query.

OPTIONS MSGLEVEL=I;
PROC SQL _METHOD;
 SELECT M.TITLE, RATING, LENGTH, ACTOR_LEADING
 FROM MOVIES M, ACTORS A
 WHERE M.TITLE = A.TITLE AND RATING = 'PG';
QUIT;

SQL Code

OPTIONS MSGLEVEL=I;
PROC SQL _METHOD;
 SELECT M.TITLE, RATING, LENGTH, ACTOR_LEADING
 FROM MOVIES M, ACTORS A
 WHERE M.TITLE = A.TITLE AND RATING = 'PG';
NOTE: SQL execution methods chosen are:
 sqxslct
 sqxjhsh
 sqxsorc(MOVIES)
 sqxsorc(ACTORS)
INFO: Index Rating selected for WHERE clause optimization.
QUIT;

Log Results

Conclusion

The SQL Procedure's _METHOD option, along with the MSGLEVEL=I system option, provides users with a powerful and effective tool for gaining greater insight into the processes during specific PROC SQL operations, query evaluation, the algorithm selected and used by the optimizer in the processing of a query, testing and debugging operations, and other processes.

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