Let the Code Report the Running Time
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ABSTRACT
A programmer/analyst may often find it necessary to know the exact start, stop, and elapsed time of a SAS code or a specific part of the code especially when it is executed through a scheduled job. SAS STIMER sometimes gives confusing information and manual calculations are still needed. This paper presents a tip on how to have the exact real running and elapsed time reported in the log. A macro utility is provided as an example of how this process can be streamlined and made flexible so that clear and customizable information can be reported.

INTRODUCTION
It is often useful to know the exact start, stop, and elapsed time of a SAS code. SAS STIMER option writes CPU and real time information to the log. It however becomes less useful and confusing when one is interested in the elapsed time of larger components rather than a single step. It would be more helpful to have the flexibility to get the running time information for whichever specific part of the code without the need of manual calculation and have it automatically reported in the log.

A MACRO EXAMPLE OF REPORTING THE RUNNING TIME
The current paper presents a simple idea to achieve this goal, which is to have SAS report the time at both of the starting and ending points of the specified code component and calculate the difference between the two time points as the elapsed time. An example is provided to show how this simple idea can be executed through a macro utility and how this process can be streamlined and made flexible so that clear and customizable information can be reported.

Below is a sample macro to accomplish this task. ‘BEGIN’ or ‘END’ (not case sensitive) can be passed to the parameter BGN_END. %RunTime(BEGIN) needs to be placed right before the block of code to be monitored, which will write the exact start time. %RunTime(END) needs to be placed right after the block of the code, which will write the end time and the calculated elapsed time to the log.

```sas
%Macro RunTime(BGN_END);
  %GLOBAL runbegin runend rundiff;
  %If &BGN_END EQ %Then %Do; /* use BEGIN by default if no parameter value is specified */
    %let BGN_END= BEGIN;
  %End;
  %If %Upcase(&BGN_END) = BEGIN %Then %Do; /*report BEGIN time */
    %Let runbegin = %Sysfunc(Datetime());
    %Let runend =;
    %Let msg = NOTE: The specified block of code BEGAN AT %Sysfunc(Sum(&runbegin), Datetime16.);.
    %End; %Else
  %If %Upcase(&BGN_END) = END %Then %Do; /*report END time and calculate elapsed time*/
    %Let runend = %Sysfunc(Datetime());
    %Let rundiff = %Sysfunc(Sum(&runend, -&runbegin));
    %Let msg = NOTE: The specified block of code ENDED AT %Sysfunc(Sum(&runend), Datetime16.);.
    %Let msg  = &msg....Elapsed time of (hh:mm:ss): %Sysfunc(Sum(&rundiff), Time8.);.
    %End;
  %Else %Do; /*To print error message if other parameter value than BEGIN and END is used*/
    %Options Nosource;
    %Let runbegin = %Sysfunc(Datetime());
```

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%Let runend = %sysfunc(Datetime());
%Put; %Put;
%Put ERROR- NOTE: Wrong parameter. Please use RunTime(BEGIN) or RunTime(END);.
%Put; %Put;
Options Source;

%goto SKIP; /*Skip to end of the macro*/
%End;

Options Nosource;
%Put; %Put;
%Put %Superq(msg); /*Print the running time message*/
%Put; %Put;
Options Source;

%SKIP: /*end of macro*/
%Mend RunTime;

MACRO USAGE EXAMPLES

As seen below, %RunTime can be placed to include any steps one is interested in retrieving the running time information from.

%RunTime(BEGIN);
data test1;
  do key=1 to 86298000;
    length data $12;
    data=put(key, words12.);
    output test1;
  end;
run;
%RunTime(End);

%RunTime(BEGIN);
data test2;
  do key=1 to 86298234;
    length data $12;
    data=put(key, words12.);
    output test2;
  end;
run;
%RunTime(End);

The start, end, and elapsed time are reported in the log shown in the screen shot below. %RunTime(BEGIN) placed before the code block reports the start time. %RunTime(END) placed after the code block reports the end and calculated elapsed time. As seen, value assigned to parameter BGN_END is not case sensitive.
561 %time(BEGIN);


562 data test1;
563 do key=1 to 6298000;
564 length data $12;
565 data-put(key, words12.);
566 output test1;
567 end;
568 run;

NOTE: The data set WORK.TEST1 has 6298000 observations and 2 variables.
NOTE: DATA statement used (Total process time):
real time 50.64 seconds
cpu time 48.62 seconds

569 %time(End);

NOTE: The specified block of code ENDED AT 01AUG13:08:54:47....Elapsed time of (hh:mm:ss): 0:00:51

570 %time(BEGIN);

NOTE: The specified block of code BEGAN AT 01AUG13:08:54:47.

572 data test2;
573 do key=1 to 6298294;
574 length data $12;
575 data-put(key, words12.);
576 output test2;
577 end;
578 run;

NOTE: The data set WORK.TEST2 has 6298294 observations and 2 variables.
NOTE: DATA statement used (Total process time):
real time 55.36 seconds
cpu time 48.49 seconds

579 %time(End);

NOTE: The specified block of code ENDED AT 01AUG13:08:55:44....Elapsed time of (hh:mm:ss): 0:00:57

By default, 'BEGIN' is assigned to BGN_END if it is not specified.

581 %time;


582 data test2;
583 do key=1 to 6298500;
584 length data $12;
585 data-put(key, words12.);
586 output test2;
587 end;
588 run;

NOTE: The data set WORK.TEST2 has 6298500 observations and 2 variables.
NOTE: DATA statement used (Total process time):
real time 52.38 seconds
cpu time 48.82 seconds

589 %time(End);

NOTE: The specified block of code ENDED AT 01AUG13:08:56:38....Elapsed time of (hh:mm:ss): 0:00:53
If a value other than 'BEGIN' and 'END' is assigned to BEG_END, a note will be reported to the log to remind that only 'BEGIN' or 'END' is valid.

DISCUSSION

This paper represents a straightforward idea of reporting running time in the log for a specific component of a SAS program. The included sample macro utility may come in handy in monitoring running status and performance of a SAS job and provides a basis for a streamlined and flexible process so that clear and customizable information can be reported.

CONTACT INFORMATION

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