

## Plan Your Work Using PROC CALENDAR

Suresh Kumar Kothakonda, inVentiv Health Clinical, Hyderabad, India

### ABSTRACT

Most of the time, we rely on our mailbox calendar, notepads etc., to get a snapshot of our schedules. Everyone loves to have visual flow of their activities. To make this convenient to everyone by using SAS system, there is a simple and easy way to organize your work events using PROC CALENDAR which can give a visual representation of collective information of tasks for a single or multiple projects of the team. CALENDAR procedure combines data from individual personal schedule with corporate schedule/events and print out calendars for individuals. While scheduling applications abound, CALENDAR procedure serves more than just printing calendars. Besides, it also organizes calendar schedules for a group or a company and keeps the data for easy retrieval. It's easy and beneficial to maintain Individuals, team's schedules. More information is detailed in this paper.

### INTRODUCTION

Generally we work on multiple projects with different time lines and will have different works to perform in a day like team meeting, trainings, deliverables and vacations. At times, we have to perform multiple tasks and we might end up in a situation where we don't have proper arrangement of our activities. CALENDAR procedure allows us to handle and manage daily routines with ease. This procedure is extremely useful to organize both individual tasks and group tasks as an individual or as a group.

It will be more helpful for Managers to allocate work to their team members considering individual vacation plan as well as holidays. They can also monitor the work allocation status of their team on different projects either individually or collectively.

### PROC CALENDAR – GENERAL RULES

PROC CALENDAR generates a calendar chart for the users based on their own input. We have the flexibility to create a chart for months or year based on requirements.

The CALENDAR procedure displays data from a SAS data set in a monthly calendar format. It can produce a schedule calendar, with events around holidays and non-work periods. Also, it produces a summary calendar which summarizes data and displays only one-day events and holidays.

Below is the syntax of the procedure extracted from SAS documentation.

#### Syntax of PROC CALENDAR :

```
PROC CALENDAR <option(s)>;
START variable;
BY <DESCENDING> variable-1 ..... <DESCENDING> variable-n <NOTSORTED>;
CALID variable </ OUTPUT=COMBINE|MIX|SEPARATE>; /* Create multiple calendars */
DUR variable;
FIN variable; } /* Create schedule calendar */
HOLISTART variable;
HOLIDUR variable; } /* Specify holidays */
HOLIFIN variable;
HOLIVAR variable;
OUTSTART day-of-week;
OUTDUR number-of-days; } /* Control display */
OUTFIN day-of-week;
MEAN variable(s) </ FORMAT=format-name>;
SUM variable(s) </ FORMAT=format-name>; } /* Create summary calendar */
VAR variable(s); /* Specifies the variables that you want to display for each activity */
RUN;
```

### SIMPLE SCHEDULE CALENDAR – 7-DAY DEFAULT CALENDAR:

Below example illustrates daily activities of an individual for a particular day. A typical work day will include study meetings and programming roles as a Developer or a Validator. PROC CALENDAR gives an overview of all activities put together in a calendar format. This gives an idea of how to manage our daily activities which are spread across different dates.

**Example 1:**

```
DATA workallot;
INPUT DATE : date7. ORD TIME $10-19 EVENT $ 20-32 LONG _CAL_ $34-45;
DATALINES;
02MAR16 1 9:00-9:30 meeting      2 TRK1
02MAR16 2 9:30-1:00 ABC123-PRI   1 TRK2
02MAR16 3 1:00-2:00 LUNCH        1 TRK2
02MAR16 4 2:00-5:00 XYZ012-VAL   3 TRK3
02MAR16 5 5:30-6:00 video call   1 TRK1
;
RUN;
PROC CALENDAR DATA=workallot;
  START date; /* Start of the activity */
  DUR long;   /* duration of each activity */
  VAR Time Event ; /* Events which we want to display */
  TITLE1 'Simple Schedule Calendar - 7-Day Default Calendar';
RUN;
```

March 2016						
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
		1	2 +=====9:00-9:30/meeting=====+ +==9:30-1:00/ABC123-PRI====+ +====1:00-2:00/LUNCH====+ +=====2:00-5:00/XYZ012-VAL=====+ +==5:30-6:00/video call====+	3		5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

**Figure 1. Simple Schedule Calendar – 7-Day Default Calendar**

### ADVANCED SCHEDULE CALENDAR:

When we use PROC CALENDAR we can

- Schedule work around holidays and other non-work periods
- Display holidays and plan vacation(s)
- Process data about multiple calendars in a single step and print them in a separate, mixed, or combined formats
- Apply different holidays, weekly work schedules, and daily work shifts to multiple calendars in a single PROC step
- Produce a mean and a sum for variables based on either the number of days in a month or the number of observations.

There are many options available to manage the tasks better. To effectively use the options, two basic datasets are needed. The first dataset is the activity dataset and the second is the holiday dataset.

**Activity Dataset:** It declares two things, the starting and ending date of the calendar and the activities which take place between those two dates.

**Holiday Dataset:** It declares the timing of all the holidays in the year.

In this example, activity dataset will have event start date and duration of events along with project details respective to programmer's initials (prg\_init) along with number of hours as per developer and validator. Holiday dataset contains the list of holidays as per the corporate schedule/events. By using these 2 datasets we will get a complete information of holidays as well as programmer's activities.

**Example 2:**

```
DATA workallot; /*activity dataset*/
INPUT DATE : date7. prg_init $ 9-10 study $ 12-17 long role $ 20-24 hrs ;
DATALINES;
01Feb16 SK ABC      1 PRI 4
01Feb16 AJ PQR      1 PRI 4
02Feb16 PK ABC      1 VAL 3
05Feb16 SK ABC      1 PRI 2
05Feb16 PK XYZ      2 PRI 4
08Feb16 SK ABC      5 PRI 4
11Feb16 AJ PQR      1 VAL 4
12Feb16 AJ ABC      1 PRI 3
12Feb16 PK Leave    2 AL  .
15Feb16 AJ PQR      5 VAL 2
06Feb16 SK Leave    2 CL  .
16Feb16 SK ABC      1 VAL 2
17Feb16 PK XYZ      1 VAL 2
18Feb16 PK ABC      1 VAL 1
18Feb16 SK ABC      1 PRI 2
;
RUN;
DATA holiday; /*holiday dataset*/
INPUT date : date7. holiday $ 11-25 prg_init $ 27-30;
DATALINES;
01JAN16  New year          HOL
09Feb16  General holiday  HOL
24Mar16  Holi              SK
01May16  MayDay           AJ
26JAN16  Republic day     PK
;
RUN;
PROC SORT DATA=workallot;
  BY date prg_init;
RUN;
PROC SORT DATA = holiday;
  BY date;
RUN;
PROC CALENDAR DATA=workallot HOLIDATA=holiday WEEKDAYS;
  /* COMBINE - combines events and holidays on the same calendar */
CALID prg_init / OUTPUT=combine; /* CALID - identify the appropriate calendar */
  START date; /* Start of the activity */
  DUR long; /* duration of each activity */
  HOLISTART date; /* Start of the holiday */
  HOLIVAR holiday; /* whose values are used to label the holidays */
  Title1 'Work Allocation Planning Calendar: Projects ';
RUN;
```

With use of CALID statement we can identify the employees calendars with their initials (ex: PK,SK,AJ and HOL(which refers to Holidays data set)). We will get an overall workflow of 3 programmers along with their leave plan and general holiday list. By using this we can track work allocation and individual utilization. It can be used for planning individual work and leaves better.

February 2016					
	Monday	Tuesday	Wednesday	Thursday	Friday
	1	2	3	4	5
PK		+=====ABC/VAL/3====+			+=====XYZ/PRI/4====>
SK	+===ABC/PRI/4====+		+=====ABC/PRI/2====+		
AJ	+===PQR/PRI/4====+				
	8	9	10	11	12
HOL		**** General Holiday ****			
PK	<=====XYZ/PRI/4==+				+=====Leave/AL====>
SK	+=====Leave/CL=====+		-----ABC/PRI/4-----+		
AJ				+=====PQR/VAL/4====+	+=====ABC/PRI/3=====+
	15	16	17	18	19
PK	!<=====Leave/AL====+		+=====XYZ/VAL/2====+	+=====ABC/VAL/1====+	
SK		+=====ABC/VAL/2=====+		+=====ABC/PRI/2====+	
AJ	+=====PQR/VAL/2-----+				
	22	23	24	25	26
	29				

Figure 2. Work Allocation Planning Calendar: Projects

**SIMPLE SUMMARY CALENDAR FOR PROJECT MANAGEMENT TASKS:**

Below is an example of a summary calendar, where it represents the number of hours spent on study as primary and validator. You can use the SUM and MEAN options to calculate sum and means for any numeric variables. These statistics appear in a box below the calendar, as shown in Figure 3.

These numbers of each programmer's role as primary and validation are put together and will try to get the overall sum and means of their activities which they had worked for a month on a particular project.

**Example 3:**

```
DATA workhours;
INPUT date : date7. prg_init $ 9-10 pri val;
DATALINES;
01Feb16 SK 4 1
02Feb16 PK 6 3
03Feb16 AJ 5 5
04Feb16 PK 6 3
05Feb16 SK 4 5
06Feb16 AJ 5 5
07Feb16 PK 8 1
08Feb16 SK 9 5
09Feb16 PK 8 1
10Feb16 AJ 4 5
11Feb16 AJ 2 2
12Feb16 PK 3 3 ;
RUN;
```

```
PROC CALENDAR DATA= workhours;
START date;
SUM pri val; /* to calculate sum */
MEAN pri val; /* to calculate mean*/
RUN;
```

February 2016				
Monday	Tuesday	Wednesday	Thursday	Friday
1	2	3	4	5
SK 4 1 8	PR 6 3 9	AJ 5 5 10	PR 6 3 11	SK 4 5 12
SR 9 5 15	PR 8 1 16	AJ 4 5 17	AJ 2 2 18	PK 3 3 19
22	23	24	25	26
29				

	SUM	MEAN
PRI	51	5.100
VAL	33	3.300

Figure 3. Simple Summary Calendar

## CONCLUSION

This paper gives a brief idea about PROC CALENDAR, its basic functionality. Individuals can check and track their overall work over a period of time (weekly /monthly/yearly). Managers can use calendar to track their team member's work load on different projects and leave plans. A graphical calendar can be created and printed as a word document. This can be stored in a common drive for reference by team or manager.

## REFERENCES

- Web site: The CALENDAR Procedure: PROC CALENDAR Statement Available at <http://support.sas.com/documentation/cdl/en/proc/61895/HTML/default/viewer.htm#calendar-calstmt.html>

## ACKNOWLEDGMENTS

I take this opportunity to thank Nitin Pawar, Senior Manager of Statistical Programming at inVentiv Health Clinical, whose support and guidance encouraged to write this paper. A special thanks to Prashanti Kowrava, Soujanya Konda and Vidhya Palaniswamy who gave me helping hand in meticulously organizing these words.

## RECOMMENDED READING

- The CALENDAR Procedure ( <http://www.okstate.edu/sas/v8/saspdf/proc/c05.pdf> )

## CONTACT INFORMATION

Your comments and questions are valued and encouraged.

Contact the author at:

Suresh Kumar Kothakonda  
 inVentiv Health Clinical  
 Hyderabad, Telangana, India - 500084  
 +91-9492437601  
[suresh.kothakonda@inventivhealth.com](mailto:suresh.kothakonda@inventivhealth.com) or [sureshkumar.kothakonda@gmail.com](mailto:sureshkumar.kothakonda@gmail.com)  
<http://www.inVentivHealthclinical.com>

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

Other brand and product names are trademarks of their respective companies.