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SAS[®] GLOBAL FORUM 2020

MARCH 29 - APRIL 1
WASHINGTON, DC



USERS PROGRAM

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Sr. Research Analyst, Central Piedmont Community College

Abstract

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The equity project at Central Piedmont Community College originally consisted of one report per new student cohort; the report was generated from historical information obtained over a three-year period.

In order to offer information on a more frequent and timely basis, the original report has been split into a series of mini-reports: first term, first year, first term in second year, second year, and third year outcome.

Selecting the appropriate report for a cohort depends on both the cohort start date and the date of code execution. SAS® software can be used to automatically analyze, select, and produce the appropriate report(s) through the use of macro functions within a larger macro.



Kelly D. Smith

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USING SAS® TO PICK THE RIGHT REPORT

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Introduction

Central Piedmont examines the academic progression of new students across their first three years at the college. Each fall, a cohort of students new to CP is established and demographic information is used to sort the students into twenty-one population groups. The academic progression and three year outcomes of each population group is tracked with fifteen metrics (Table 1). The data from this project has provided a lens to examine student equity and insight into the student experience at CP.

Tracking Groups

- All new students
- Females / males
- African American – Females / Males
- LatinX – Females / Males
- White – Females / Males
- Under 18
- 18-20 years old
- 21-24 years old
- 25 and over
- Academically and economically prepared
- Pell recipients
- High poverty zip codes
- Developmental
- High school graduate with GPA < 2.0
- Veterans
- GED completers
- Students receiving accommodations
- track student progression and outcome
- International

Objectives

- Minimize code to update prior to execution**
- Examine full- / part-time students separately**
- Improve efficiency**

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Progression and Outcome Metrics

Time Frame	Metric Name	Metric Definition
First Term	Zero Credits	Withdrew and/or failed all courses in first term
	Successful Completion 66% Credit Hours	Completed at least 66% of credit hours with A, B, C, or P
	12 or More Credits Earned *	Completed at least 12 credit hours with A, B, C, D, or P
First Year	Return First Spring	Present as FTE eligible student in first Spring term
	Successful Completion College English	Attempted and Completed college level English with A, B, or C
	Successful Completion College Math	Attempted and Completed college level Math with A, B, or C
Second Year	24 or More Credits Earned *	Completed at least 24 credit hours with A, B, C, D, or P
	Return Second Fall	Present as FTE eligible student in second Fall term
	48 or More Credits Earned *	Completed at least 48 credit hours with A, B, C, D, or P
Third Year	Three Year Outcome	
	Credential and Transfer	Credential and Transfer to 4 year institution within 3 years
	Credential, no Transfer	Credential within 3 years, but no Transfer to 4 year institution
	Transfer and no Credential	No Credential, but Transfer to 4 year institution within 3 years
	Enrolled Year 3	Enrolled in Fall, Spring, or Summer Term of Year 3
	Credentialed, Transferred or Enrolled	Sum of four previous categories
	Outcome Unknown	Not credentialed, transferred, or enrolled in third year

Note. Credential = Associate Degree, Certificate, or Diploma

Table 1. Metrics used to track student progression and outcome

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Macro Variables

Many of the codes used at Central Piedmont contain specific term names throughout a program, making it difficult to update the code manually. Macro variables facilitate code updates by substituting specific text in selected spots throughout the code. Some macro variables are automatic, but macro variables can also be created with %LET or the CALL SYMPUT procedures.

The majority of SAS programs at CP start with a series of macro variables. Macro functions can be used to manipulate and create text strings; macro functions can thereby work on macro variables, which consist of text strings (Carpenter, 2000; Stroupe, 2003). Updating the code is simplified by using building block macro variables to construct other macro variables. If additional text needs to be combined with text generated by a macro variable, the end point of the macro variable name should be identified with a delimiter such as a period or a space (Table 2).

Original Macro Variables

```
%LET yt01=201503;          /* Year One */
%LET yt02=201601;
%LET yt03=201602;
%LET yt04=201603;          /* Year Two */
%LET yt05=201701;
%LET yt06=201702;
%LET yt07=201703;          /* Year Three */
%LET yt08=201801;
%LET yt09=201802;
```

Updated Version, starting from %LET yt01=2015;

Macro Code (%LET =)	Resolved Variable
yr02 = %EVAL(&yr01+1); yr03 = %EVAL(&yr01+2); yr04 = %EVAL(&yr01+3);	yr02 = 2016 yr03 = 2017 yr04 = 2018
yt01 = &yr01.03; yt01b = Fall &yr01 ft01= &yr01.CU3; fy02 = &yr01&yr02;	yt01 = 201503 yt01b = Fall 2015 ft01 = 2015CU3 fy02 = 20152016
yt07 = &yr03.03; yt08 = &yr04.01; yt09 = &yr04.02;	yt07 = 201703 yt08 = 201801 yt09 = 201802

Table 2. Using macro variables and functions to build new macro variables

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Splitting students by full / part –time status

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Three progression metrics have different standards for full- and part-time students (credits earned first term, credits earned first year, credits earned second year).

To accurately and efficiently create reports for both part- and full-time students while accounting for their respective credit goals, the code was split into a series of report macros based on the metrics' appropriate time frame (first term, first year, second year first term, second year, third year).

Each report macro has the same five parameters (Table 3) for consistency. With the use of parameters, the same code can be used for each type of student. Each macro executes twice, once for part-time and once for full-time cohort students.

The parameters are included in the macro call:

```
%Report (FT, Full-Time, 12, 24, 48);
```

```
%Report (PT, Part-Time, 6, 12, 24;
```

Parameter	Definition	Part-Time	Full-Time
ftpt00	Student status code	PT	FT
ftpt01	Student status name	Part-Time	Full-Time
fttm	First term credit goal	6	12
ftyr	First year credit goal	12	24
ftyr2	Second year credit goal	24	48

Table 3. Using macro parameter to separate full- and part-time students

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Analyzing the Date to pick the Report

In order to determine which reports are available for each cohort, the start date (term) for the cohort is compared to the date of code execution. The relationship between the two dates is used to select the correct report(s) for processing.

Initially, all reports are assumed to be appropriate. As the analysis proceeds, reports are excluded based on the relationship between the dates (Figure 1).

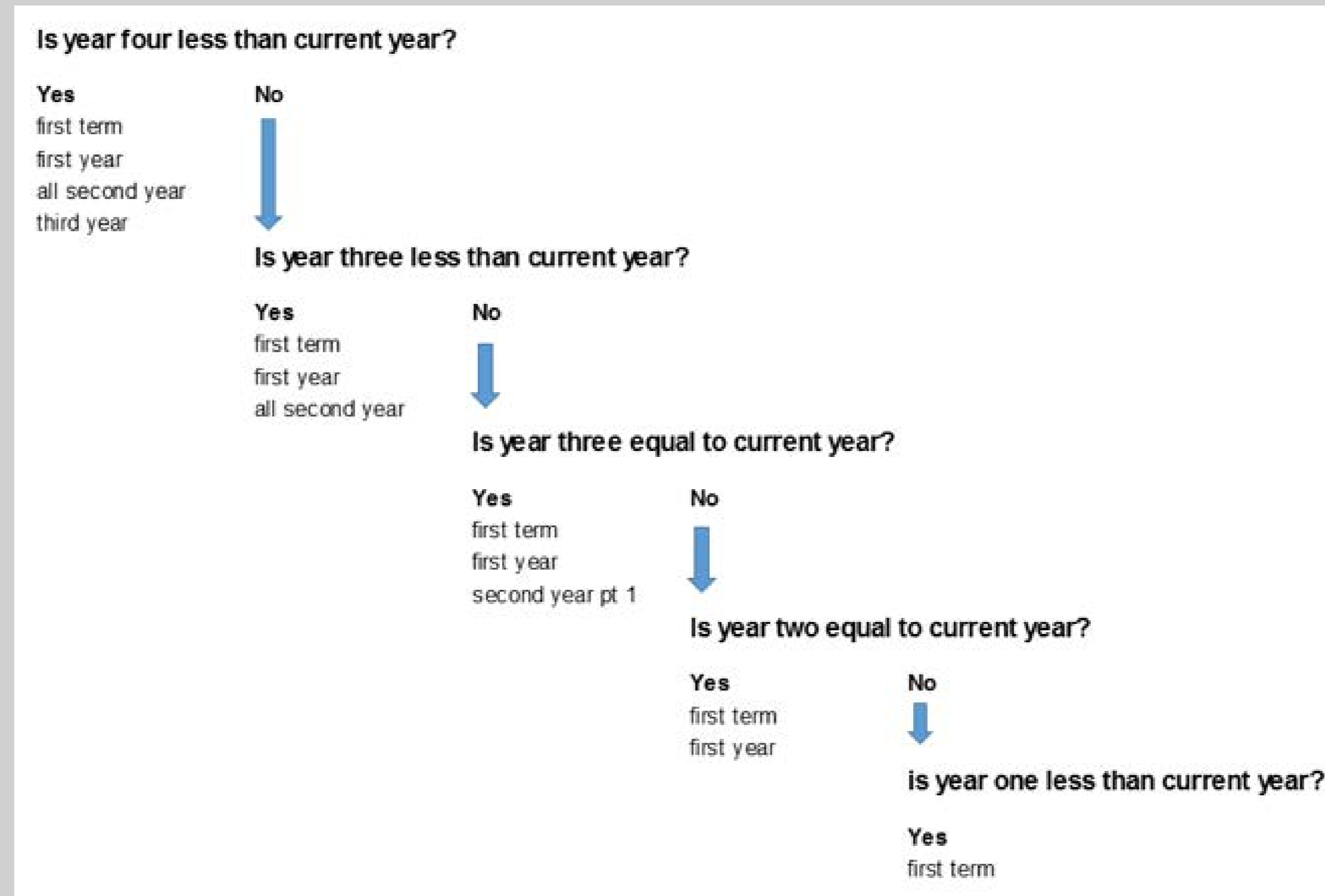


Figure 1. Logic tree for selecting cohort reports

Report Macro

The automatic macro variable, &SYSDATE9, is used to establish the current date (DDMMMYYYY). The year portion of the current date is extracted with the %SUBSTR macro function. Date analysis is performed through the use of macro functions for conditional processing.

The term analysis code uses the macro function %INCLUDE to pull in appropriate report code(s) based on the analysis; %INCLUDE is directed to the location of a report code through the use of a FILENAME statement.

```
%LET today=&SYSDATE9;
%LET now=%SUBSTR(&today,6,4);
FILENAME RPT "C:\Users\SKD4306E\Desktop\2019 Conference\SASMacro";

%MACRO ANALYSIS;

%IF &yr04 LT &now %THEN %DO;
  %INCLUDE RPT(First_Term_Report);
  %INCLUDE RPT(First_Year_Report);
  %INCLUDE RPT(Second_Year_Report);
  %INCLUDE RPT(Third_Year_Report);
%END;

%ELSE %IF &yr03 LE &now %THEN %DO;
  %INCLUDE RPT(First_Term_Report);
  %INCLUDE RPT(First_Year_Report);
  %INCLUDE RPT(Second_Year_Report);
%END;

%ELSE %IF &yr02 EQ &now %THEN %DO;
  %INCLUDE RPT(First_Term_Report);
  %INCLUDE RPT(First_Year_Report);
%END;

%ELSE %IF &yr01 LT &now %THEN %DO;
  %INCLUDE RPT(First_Term_Report);
%END;

%MEND;
```

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CONCLUSION

CPCC first started tracking new fall cohorts in late 2017. The initial approach to generating cohort reports required three years of progression and outcome metrics, limiting the actionable nature of the information produced. Over the past two years, the code has evolved as the project has evolved. The use of macro variables, macro functions, and macro programs has improved the flexibility, usability, and efficiency of the code.

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References

- Carpenter, A. L. (2000). Using macro functions. *Proceedings of the SAS Users Group International 2000*.
- Smith, Kelly D. (2019). *Which report is appropriate? Let SAS® figure it out!* Paper presented at the SouthEast SAS Users Group, Williamsburg, Virginia.
- Stroupe, J. (2003). Nine steps to get started using SAS® Macros. *Proceedings of the Pharmaceutical Software Users Group 2003*.

The banner features a scenic background of the Washington Monument at dusk, with a vibrant sky of pinks, oranges, and blues. In the foreground, there is a stone-lined canal with cherry blossom trees on the left. A dark teal rectangular box is centered over the image, containing the event title in white and teal text.

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