

# SESUG Paper 30-2021

## Differentiate Yourself

Kirk Paul Lafler, @sasNerd

### Abstract

Today's job, employment, contracting, and consulting marketplace is highly competitive. As a result, SAS® professionals should do everything they can to differentiate and prepare themselves for the global marketplace by acquiring and enhancing their technical and soft skills. Topics include describing how SAS professionals should assess and enhance their existing skills using an assortment of valuable, and “free”, SAS-related content; become involved, volunteer, publish, and speak at in-house, local, regional and international SAS user group meetings and conferences; and publish blog posts, videos, articles, and PDF “white” papers to share knowledge and differentiate themselves from the competition.

### Introduction

As technology continues to reach for newer and greater horizons, it is becoming increasingly more important for students, professionals, and anyone with a curiosity for knowledge to find ways to continue their quest for learning. In the Occupational Outlook Handbook, the Bureau of Labor Statistics projects the top eleven occupations with the highest percent change of employment between 2019 and 2029, as shown in Figure 1, below.

OCCUPATION	GROWTH RATE, 2019-29	2019 MEDIAN PAY
<a href="#">Wind turbine service technicians</a>	61%	\$52,910 per year
<a href="#">Nurse practitioners</a>	52%	\$109,820 per year
<a href="#">Solar photovoltaic installers</a>	51%	\$44,890 per year
<a href="#">Occupational therapy assistants</a>	35%	\$61,510 per year
<a href="#">Statisticians</a>	35%	\$91,160 per year
<a href="#">Home health and personal care aides</a>	34%	\$25,280 per year
<a href="#">Physical therapist assistants</a>	33%	\$58,790 per year
<a href="#">Medical and health services managers</a>	32%	\$100,980 per year
<a href="#">Physician assistants</a>	31%	\$112,260 per year
<a href="#">Information security analysts</a>	31%	\$99,730 per year
<a href="#">Data scientists and mathematical science occupations, all other</a>	31%	\$94,280 per year

**Figure 1. U.S Bureau of Labor Statistics Fastest Growing IT Jobs (2019 – 2029)**

As the world’s largest privately held software company, SAS Institute continues its growth by dominating in several “key” areas including the world of big data and data analytics. SAS Institute is a top 10 software company with 14,000 employees and more than 80,000 business, government and university customer sites in 146 countries (i.e., the United States, Canada, Europe, Middle East, Africa, Asia Pacific and Latin America). SAS software is used by 90 percent of the top 100 companies on the 2019 Fortune Global 500 List. In a report by Statista (2020, Arne Holst), “SAS Institute is the leading software vendor in the global advanced and predictive analytics software market with a share of more than 25 percent.” Also, as a privately held company, SAS Institute won the coveted “**Best Place to Work**” Awards two consecutive years, (2011 – 2012); 2019 Worldwide Revenue of \$3.1 billion (U.S.) and an R&D Investment of 25% of Revenue.

In a 2019 survey conducted by Burtch Works Executive Recruiting the organization asks a group of college / graduate students, data science and analytics professionals whether they prefer using SAS, Python or R. Although open source software like Python and R are experiencing continued growth among college / graduate students studying data science and analytics, SAS still dominates as the tool of choice among working professionals, as shown in Figure 2, below.

Years' Experience

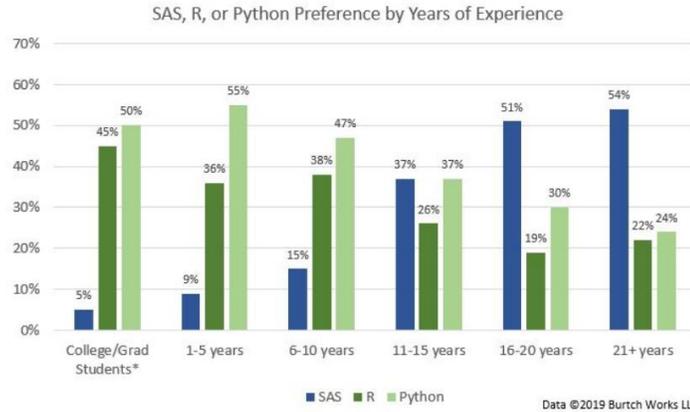


Figure 2. U.S Bureau of Labor Statistics Fastest Growing IT Jobs (2019 – 2029)

Burch Works reported the findings among respondents in the area of study for the highest degree earned and their tool preferences. Among respondents the votes were relatively close in four of the seven areas of study, Economics, Social Sciences, Mathematics/Statistics and Business; but Python is experiencing increasing growth in Engineering, Computer Science and Natural Science, as shown in Figure 3, below.

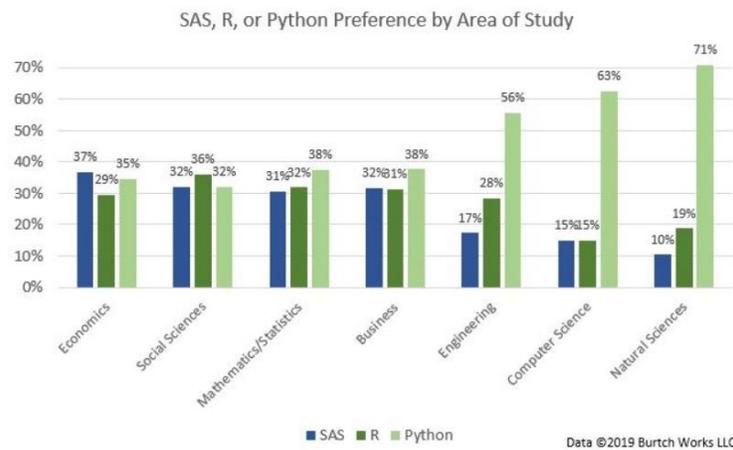


Figure 3. SAS, R or Python Preference by Area of Study

Burch Works also reported found among respondents their preferred tool by industry, as shown in Figure 4, below.

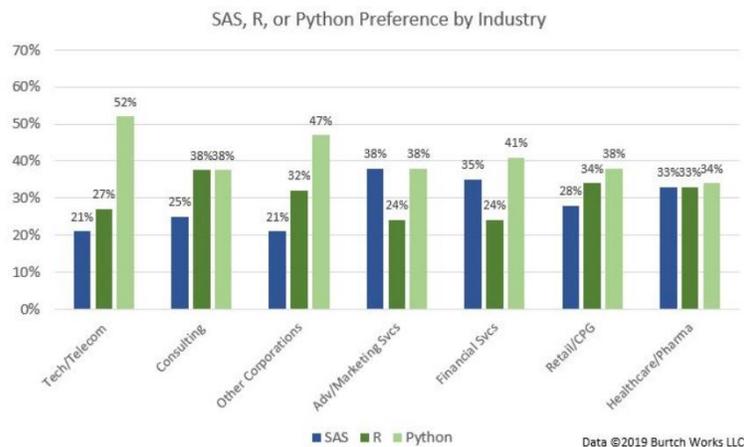


Figure 4. SAS, R or Python Preference by Industry

The Bureau of Labor Statistics mentions that the employment of software developers is projected to grow 22 percent from 2019 to 2029, much faster than the average for all occupations, as shown in Figure 5, below.

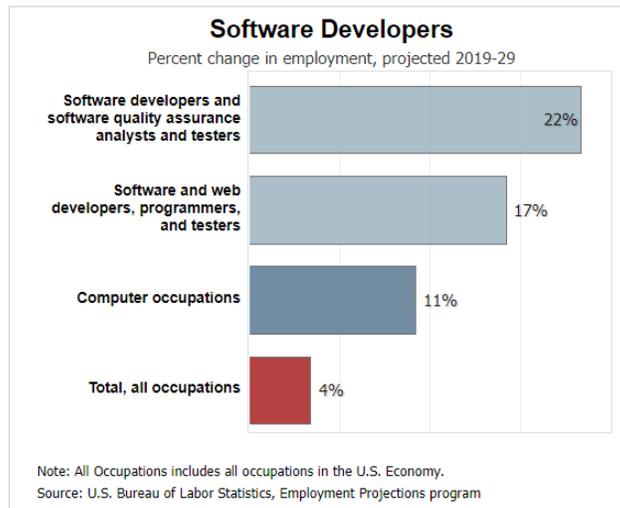


Figure 5. Employment of Software Developer Growth Projections from 2019 to 2029 (Bureau of Labor Statistics)

### Differentiate Yourself

Anyone looking to stand out from the crowd and/or begin your rise to the top must learn how to differentiate themselves. But how is this accomplished? Invest in yourself. Take initiative. Pursue excellence in everything you do. Look for opportunities and, more importantly, make the most of every opportunity. Understand the impact of and, more importantly, how to leverage technology. Become involved by volunteering at your in-house, local, regional, special-interest and/or international SAS users group conferences and meetings. Become dedicated to something greater than oneself. These are just a few ways to stand out from the masses – make it happen.

### Start by Taking Inventory of and/or Developing Your Skills

The Free Merriam-Webster Dictionary defines skill as, *“the ability to do something that comes from training, experience, or practice.”* A skill must be developed – one isn’t born possessing many desirable skills. So, how does one go about assessing what skills they already possess while seeking additional skills that may be needed? Begin by taking inventory of any skills you might already possess – simply make a list. The list of existing skills might look something like the following, as shown in Figure 6, below.

Inventory of Existing Skills
DATA/PROC Step Programming
Data Access
Data Transformation
Data Cleaning
Data Manipulation
ODS, Reporting and Specialized Output
Macro Programming
Statistical Analysis
Data-driven Application Development
User Interface Design
Database Design
Technical Writing

Figure 6. Inventory of Existing Skills

Once you've taken inventory of your skills, assign a ranking to each skill using the following values, as shown in Figure 7, below.

Ranking of Existing Skills
0 = None
1 = Heard of it, but little or no experience
2 = Some working knowledge
3 = Proficient
4 = Expert

Figure 7. Ranking of Existing Skills

After that, rank your skill level by assigning a value to your level of competence with a value, as shown in Figure 8, below.

Identify Level of Competence
0 = None
1 = Out-of-date
2 = Competitive
3 = Cutting Edge

Figure 8. Level of Competence

Finally, categorize your skills by functional discipline, as shown in Figure 9, below.

Categorize Skills by Functional Discipline
Data Access
Data Cleaning
Systems Analysis
Programming
Application Development
User Interface Design
Report, Table and Chart Design
SDLC
Statistical analysis
Data mining
Teaching
Technical Support
Debugging

Figure 9. Categorization of Skills by Functional Discipline

## Develop and Improve Your Skills

There are a number of ways for SAS users to develop and/or improve their skills. The following list identifies popular methods that SAS professionals use to enhance their skills and, as a result, become more competitive, as shown in Figure 10, below.

Popular Methods of Developing and Improving Skills
1) Download, use and learn valuable techniques using the "free" SAS OnDemand for Academics software
2) Access and learn valuable techniques from the SAS Technical Support website at <a href="http://support.sas.com">support.sas.com</a>
3) Access valuable and useful tips and techniques on SAS Support Communities
4) Download and use the "free" Online SAS documentation
5) Access and learn application-oriented techniques using the published "White" papers on <a href="http://LexJansen.com">LexJansen.com</a>
6) Learn from the experts by reading user-written books from SAS Press
7) Attend, Volunteer and Present at in-house, local, regional, special-interest and international SAS user groups
8) Collaborate / Network with other SAS users
9) Become certified with SAS Certification exams

Figure 10. Methods of Developing and Improving Your Skills

To better understand what skills have the greatest impact to salaries, PayScale, Inc., a Seattle-based company, shares their list of skills, along with the percentage increase to the salaries of SAS programmers, as shown in Figure 11, below.

Skill	Percentage Increase
UNIX	▲ 19%
Linux	▲ 13%
PL/SQL	▲ 12%
Oracle	▲ 11%
Windows Operating System	▲ 10%
SQL	▲ 5%
Statistical Analysis	▲ 5%
Data Analysis	▲ 2%
Microsoft Access	▲ 2%
National Average	\$78,000

**Figure 11. Skills List and Increase in Salary**

Source: [http://www.payscale.com/research/US/Job=SAS\\_Programmer/Salary](http://www.payscale.com/research/US/Job=SAS_Programmer/Salary)

## How to Differentiate Yourself

From time-to-time it becomes important to be able to differentiate yourself from the competition. SAS professionals should strike a balance between differentiating oneself and giving back (or sharing) learned skills with others. Giving back provides a true sense of worth through the process of mentoring others, sharing ideas and techniques, along with being open to provide information that others may benefit from. Giving back also provides an incredible way to initiate and foster potential collaborations while reinforcing your own strengths and interests by example. A list of a few popular ways to differentiate yourself is displayed in Figure 12, below.

Popular Ways to Differentiate Yourself from the Competition	
1)	Earn an Advanced Degree and/or Certification
2)	Attend, Volunteer and Present at in-house, local, regional, special-interest and international SAS user groups
3)	Share Your Knowledge (or Mentor) Colleagues
4)	Collaborate with others
5)	Read, Study and Learn from the published “white” papers on LexJansen.com
6)	Access and Learn One New Technique Each Day from the Content on support.sas.com
7)	Become SAS Certified (Base, Advanced, Clinical Trials, Predictive Modeler, Statistical Business Analyst, BI Content Developer, Visual Business Analyst, Data Integration Developer, Data Quality Steward, Platform Administrator)
8)	Build Social Networking Connections on LinkedIn, Blogs, etc.

**Figure 12. Popular Ways to Differentiate Yourself from the Competition**

## Massive Open Online Content (MOOC)

A MOOC is structured very similar to an online course. A MOOC typically is listed with a course/seminar/webinar title, abstract or description of its content, a syllabus, expected learning objectives, “live” or recorded lectures or lessons, reading assignments, hands-on assignments, and quizzes. Students tune in to the “live” or recorded lectures, perform the required reading and hands-on assignments, and take the quizzes, adhering to the required scheduled timeline. At the completion of a MOOC, students may even be able to receive a grade from the MOOC leader or instructor, just as if they had enrolled in a traditional course.

Many forward-thinking organizations, universities and degree-granting institutions use the advances that technology provides to help make some of their courses available to the masses around the world. The MOOC format offers an alternative to mainstream courses, degrees, and certificate programs that were once only available through brick-and-mortar classrooms where attendees were forced to commute to supported locations or become a resident on college campuses.

## A Review of “Free” MOOC Resources

As the age of massive open online content (and courses or MOOCs) is upon us, there are many “free” MOOC resources. Numerous MOOC courses and content are now available to provide SAS users in their quest to improve their analytical, programming, statistical, and reporting skills. For content and courses that may contain a sizeable amount of material, some MOOC offerings may involve splitting larger and more involved topics into smaller, more digestible, pieces, a process known as specializing. SAS users can find “free” MOOC resources available to SAS users everywhere, as shown in Figure 13, below.

<b>“Free” MOOC Resources for SAS Users</b>	
1)	SAS OnDemand for Academics software
2)	SAS Technical Support website at <a href="http://support.sas.com">support.sas.com</a>
3)	Online SAS Documentation in PDF and HTML format on <a href="http://support.sas.com">support.sas.com</a>
4)	Published “White” Papers on <a href="http://Lexjansen.com">Lexjansen.com</a>
5)	SAS Press and SAS Talks Webinars
6)	SAS YouTube Channel Videos
7)	In-house and Local SAS Users Group meetings

Figure 13. “Free” MOOC Resources

## SAS® OnDemand for Academics Software

The SAS® OnDemand for Academics software is “free” for students, professionals, individual learners and instructors to use. The software suite includes Base SAS®, SAS Studio, SAS/STAT®, SAS/ACCESS® for Windows, SAS/ETS®, SAS/OR®, and SAS/IML®. It works through your Browser in the cloud to access to SAS software.

### Base SAS Features

The Base SAS software contains a built in DATA step programming language, the ability to access a wide-range of data sources, comprehensive set of functions to handle data manipulation, an assortment of “canned” and ready-to-use procedures, a comprehensive SQL language, reporting and customization feature for reports and results using Output Delivery System (ODS), data display informats and output formats, comprehensive data visualization features known as ODS Statistical Graphics, data management capabilities, and much more.

### SAS/STAT® Features

The SAS/STAT software supports the application of the latest statistical techniques. It supports the following statistical routines: Analysis of Variance, Bayesian Analysis, Categorical Data Analysis, Cluster Analysis, Mixed Models, Multivariate Analysis, Nonparametric Analysis, Regression Analysis, Survey Sampling and Analysis, Statistical Graphics, and much more.

### SAS/IML® Features

The SAS/IML software is an interactive matrix programming language and supports the ability to conduct Exploratory Analysis, the integration with the R programming language, dynamically linked graphics, and much more.

### SAS/ACCESS® Features

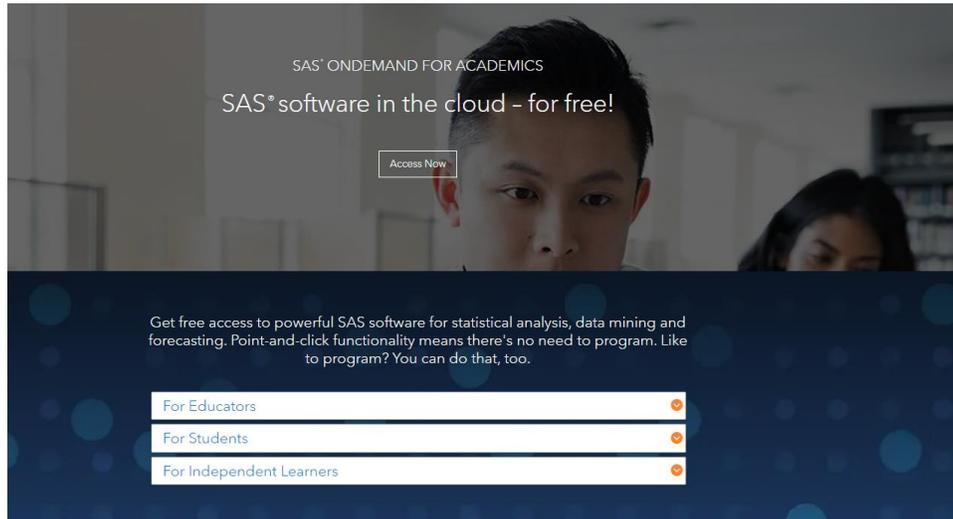
The SAS/ACCESS software supports the ability to read, write, and update data sources; provides a flexible query language; supports the access to a variety of data sources including text files, dat files, CSV files, Excel spreadsheets, Microsoft SQL Server, and ODBC; and much more.

### SAS Studio

The SAS Studio software serves as the user interface; supports Web applications; the access to data files, libraries and programs; the ability to recover files; dynamically link graphics; and much more.

### SAS OnDemand for Academics Software “In the Cloud” Website

The SAS OnDemand for Academics software website can be accessed at [SAS OnDemand for Academics Software](#), as shown in Figure 14, below.

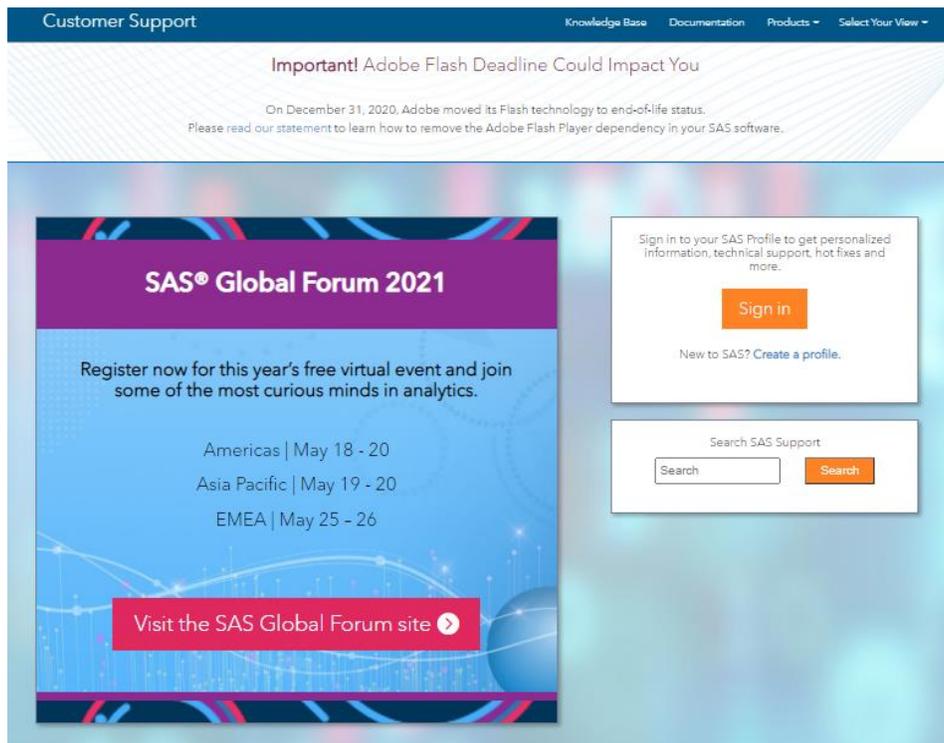


Advance your analytical skills to help secure your future.

**Figure 14. Snapshot from SAS OnDemand for Academics website**

### SAS’ “World Class” Technical Support Website

SAS’ technical support website, [support.sas.com](http://support.sas.com), contains a wealth of “free” SAS technical support content. Users are provided with access to timely information pertaining to: Admin, Programmer, Statistician and User content; comprehensive technical support content; training and books; what’s happenings including User Group Information; access to “free” webinars and podcasts; access to code samples and comprehensive documentation; and more, as is illustrated in Figure 15, below.



**Figure 15. support.sas.com website**

**Knowledge Base – SAS Products and Solutions**

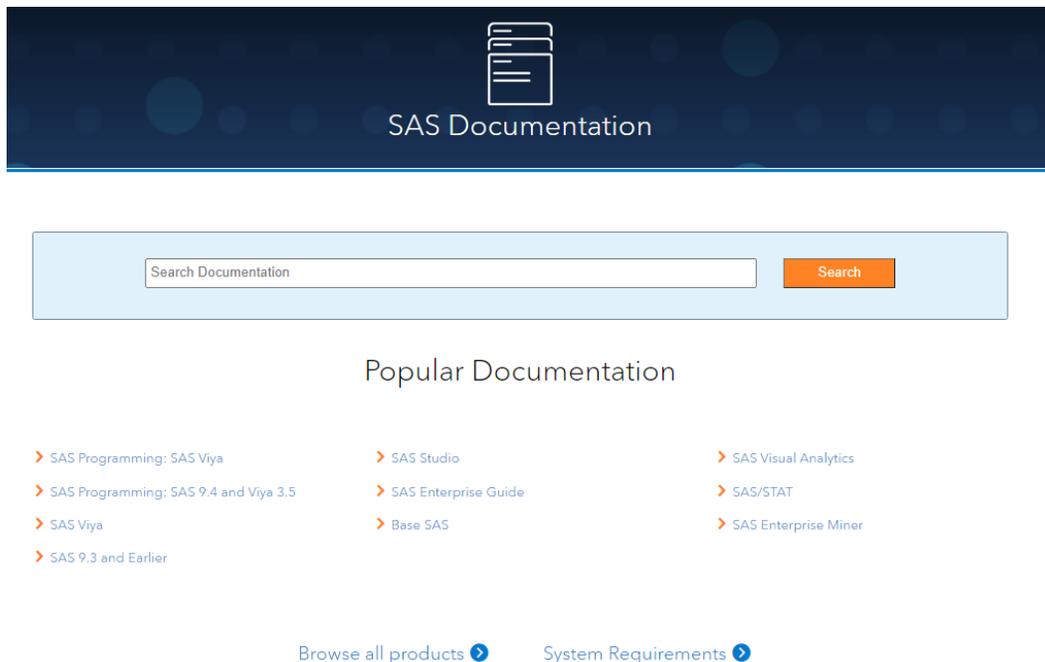
Users can easily explore the Knowledge Base of SAS Products and Solutions, Third-Party Software Reference, Documentation, Papers, Samples & SAS Notes, and Focus Areas by accessing <http://support.sas.com/software/>, illustrated in Figure 16, below.



**Figure 15. Knowledge Base – SAS Products and Solutions**

**Knowledge Base – Documentation**

Users have the ability to access a comprehensive set of SAS product documentation in either HTML or PDF format and can be accessed at <http://support.sas.com/documentation/index.html>, as shown in Figure 16, below.



**Figure 16. Knowledge Base – SAS Product Documentation**

### Published SAS Proceedings and “White” Papers

SAS users have access to a repository of thousands of “free” published SAS “white” papers all in the form of PDF documents. Provided with a built-in Google® search applet, users are able to search for content from 1976 to the present from SGF / SUGI, SUEGI, the various Regional conferences, PharmaSUG / PharmaSUG China, PHUSE, CDISC Forum, and other venues. Papers can be accessed using the <https://www.lexjansen.com/> user interface, as shown in Figure 17, below.

**Gone but not forgotten**  
More ...

in | | | | |

## SAS Conference Proceedings (1976 - present) ... and more

This searches **34594** conference papers from SAS Global Forum, SUGI, PharmaSUG, PHUSE, NESUG, SESUG, WUSS, MWSUG, PNWSUG, SCSUG, SEUGI, ...

ENHANCED BY Google

Perform a [search](#) for SAS papers based on title, author or keywords.

[Papers](#) presented by Lex Jansen.

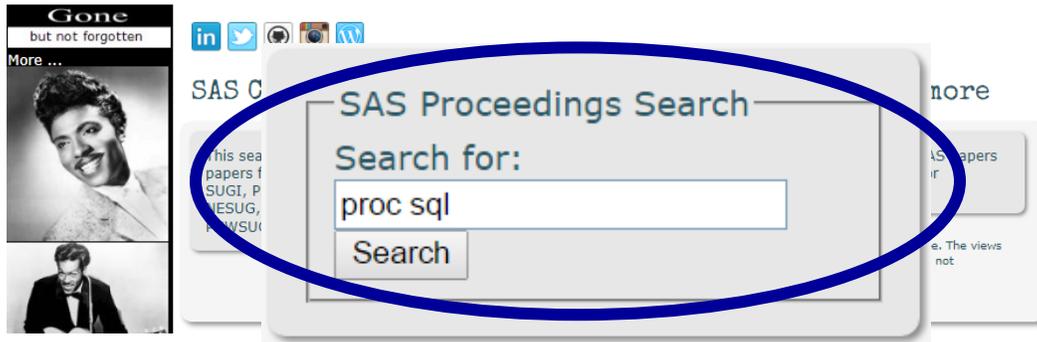
[Lex Jansen](#) is a SAS employee. The views expressed on this website do not represent the views of SAS. [Contact me.](#)

<p>536 papers presented at <a href="#">PHUSE US Connect</a> 2018-2020.</p> <p>PHUSE US Connect 2021 June 14-18 - Virtual Event</p>	<p>12730 papers presented at <a href="#">SUGI / SAS Global Forum</a> 1976-2020.</p> <p>SAS Global Forum 2021 May 18-20 - Virtual Event</p>	<p>3479 papers presented at <a href="#">PharmaSUG</a> 1997-2020.</p> <p>PharmaSUG 2021 May 24-28 - Virtual Event</p>
<p>388 papers presented at <a href="#">PharmaSUG China</a> 2012-2019.</p> <p>PharmaSUG China 2021 August 27-28 - Shanghai, China</p>	<p>2816 papers presented at <a href="#">WUSS</a> 1993-2019.</p> <p>WUSS 2020 Cancelled</p>	<p>2111 papers presented at <a href="#">MWSUG</a> 1990-2019.</p> <p>MWSUG 2021 September 12-14 - Pittsburgh, PA</p>
<p>242 posters presented at <a href="#">PHUSE/FDA CSS</a> 2012-2019.</p> <p>PHUSE CSS 2021 September 13-15 - Virtual Event</p>	<p>3067 papers presented at <a href="#">SESUG</a> 1993-2020.</p> <p>SESUG 2021 October 17-19 - Virtual Event</p>	<p>1402 papers presented at <a href="#">SCSUG</a> 1991-2019.</p> <p>SCSUG 2020 Cancelled</p>
<p>1864 papers presented at <a href="#">PHUSE EU Connect</a> 2005-2019.</p> <p>PHUSE EU Connect 2021 November 15-19 - Virtual Event</p>	<p>3123 papers presented at <a href="#">NESUG</a> 1988-2013.</p> <p>115 papers presented at <a href="#">VIEWS</a> 2001-2004.</p>	<p>286 papers presented at <a href="#">PNWSUG</a> 1996-1998, 2004-2009.</p> <p>2435 papers presented at <a href="#">SEUGI</a> 1983-2003.</p>
<p>1715 papers and posters related to <a href="#">CDISC</a> 2001-2020.</p>		

Figure 17. Published SAS Proceedings on [www.lexjansen.com](http://www.lexjansen.com)

**LexJansen.com – Search Feature**

LexJansen.com provides a built-in Google search applet that can be used by users to find papers of interest, as shown in Figure 18, below.



**Figure 18. Built-in Google Search Applet in LexJansen.com**

**LexJansen.com – Search Results**

LexJansen.com’s search results display the most relevant results first, based on the search keyword or phrase entered in the search box, as illustrated in Figure 19, below.

This searches SAS proceedings from SAS Global Forum, SUGI, PharmaSUG, PhUSE, NESUG, SESUG, SCSUG, WUSS, MWSUG, SCSUG and PNWSUG.

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**SAS Paper Search**

About 11,900 results (0.32 seconds)

[SUGI 27: An Introduction to PROC SQL](#)  
support.sas.com > resources > papers > proceedings > proceedings > sugi27  
 File Format: PDF/Adobe Acrobat  
 PROC SQL can be used to retrieve, update, and report on information from SAS data sets or other database products. This paper will concentrate on SQL's syntax ...

[268-29: Introduction to PROC SQL](#)  
support.sas.com > resources > papers > proceedings > proceedings > sugi29  
 File Format: PDF/Adobe Acrobat  
 PROC SQL can be used to retrieve, update, and report on information from SAS data sets ... Every PROC SQL query must have at least one SELECT statement.

[200-2013: Exploring the PROC SQL\\_METHOD Option](#)  
support.sas.com > resources > papers > proceedings13  
 File Format: PDF/Adobe Acrobat  
 Lafer, Kirk Paul (2006). "A Hands-on Tour Inside the World of PROC SQL." Proceedings of the 31st Annual SAS Users Group. International Conference, Software ...

[257-2013: Top 10 Most Powerful Functions for PROC SQL](#)  
support.sas.com > resources > papers > proceedings13  
 File Format: PDF/Adobe Acrobat  
 Equipped with PROC SQL. SAS upgrades to a full-fledged relational database management system. PROC SQL provides alternative ways to manage data other ...

[SUGI 27: An Introduction to SAS\(r\) PROC SQL](#)  
support.sas.com > resources > papers > proceedings > proceedings > sugi27  
 File Format: PDF/Adobe Acrobat  
 assigning data to SAS Macro variables (6) comparing and contrasting PROC SQL with the SAS DATA Step and other SAS Procedures. Creating output and new ...

[Demystifying PROC SQL](#)  
support.sas.com > resources > papers > proceedings12  
 File Format: PDF/Adobe Acrobat  
 Dec 6, 2011 ... intimidate SAS® programmers accustomed to getting the DATA step to do ... each of PROC SQL's clauses, with particular focus on problems ...

[SUGI 25: Introduction to PROC SQL](#)  
support.sas.com > resources > papers > proceedings > proceedings > sugi25 > btu  
 File Format: PDF/Adobe Acrobat  
 PROC SQL can be used to retrieve, update, and report on information from SAS data sets or other database products. This paper will concentrate on SQL's syntax ...

[Anything You Can Do I Can Do Better: PROC FEDSQL VS PROC SQL](#)  
www.sas.com > dam > SAS > support > sas-global-forum-proceedings  
 File Format: PDF/Adobe Acrobat  
 A benefit of the SQL Procedure is that you can write queries or execute SQL statements on a SAS dataset or in a database. Another benefit is the SQL language ...

[200-2009: PROC SQL and SAS® Macro: Beyond the Basics](#)  
support.sas.com > resources > papers > proceedings09  
 File Format: PDF/Adobe Acrobat  
 The CALL SYMPUT routine and DATA\_NULL\_ are the traditional methods to create macro variables from SAS data. However, PROC SQL is much more powerful ...

[042-29: Top Ten Reasons to Use PROC SQL](#)  
support.sas.com > resources > papers > proceedings > proceedings > sugi29  
 File Format: PDF/Adobe Acrobat  
 "Comparative Efficiency of SQL and Base Code When Reading from Database Tables and Existing Data Sets." Proceedings of SAS User Group International ...

1 2 3 4 5 6 7 8 9 10

**Figure 19. LexJansen.com Search Results**

**Viewing a Paper from LexJansen.com**

Any paper of interest that is found with the built-in Google search applet and/or displayed in the search results can be viewed, saved, or printed as needed. A “sample” paper from LexJansen.com is shown in Figure 20, below.

Paper BB03-2014

## Five Little Known, But Highly Valuable and Widely Usable, PROC SQL Programming Techniques

Kirk Paul Lafler, Software Intelligence Corporation, Spring Valley, California

**Abstract**  
The SQL Procedure contains a number of powerful and elegant language features for SQL users. This presentation highlights five little known, but highly valuable and widely usable, topics that will help users harness the power of the SQL procedure. Topics include using PROC SQL to perform FIRST., LAST. and Between in BY-group processing; constructing and searching the contents of a value-list macro variable for a specific value; data validation operations; data summary operations to process down rows and across columns; and using the MSGLEVEL= system option and \_METHOD SQL option to capture and gain greater insight into the processes during query evaluation, the algorithm selected and used by the optimizer when processing a query, testing and debugging operations, and other processes.

**Introduction**  
The SQL procedure is a wonderful tool for querying and subsetting data; restructuring data by constructing case expressions; constructing and using virtual tables known as a view; access information from Dictionary tables; and joining two or more tables to explore data relationships. Occasionally, an application problem comes along where the SQL procedure is either better suited or easier to use than other more conventional DATA and/or PROC step methods. As each situation presents itself, PROC SQL should be examined to see if its use is warranted for the task at hand.

**Example Tables**  
The examples used throughout this paper utilize a database of two tables. (A relational database is a collection of tables.) The data used in all the examples in this paper consists of a selection of movies that I've viewed over the years. The Movies table consists of six columns: title, length, category, year, studio, and rating. Title, category, studio, and rating are defined as character columns with length and year being defined as numeric columns. The data stored in the Movies table is depicted below.

**MOVIES Table**

	Title	Length	Category	Year	Studio	Rating
1	Brave Heart	177	Action Adventure	1995	Paramount Pictures	R
2	Carablanca	103	Drama	1942	MGM / UA	PG
3	Christmas Vacation	97	Comedy	1989	Warner Brothers	PG-13
4	Coming to America	116	Comedy	1988	Paramount Pictures	R
5	Dracula	130	Horror	1931	Columbia TriStar	R
6	Dressed to Kill	105	Drama Mystery	1980	Filmways Pictures	R
7	Forest Gump	142	Drama	1994	Paramount Pictures	PG-13
8	Ghost	127	Drama Romance	1990	Paramount Pictures	PG-13
9	Jaws	125	Action Adventure	1975	Universal Studios	PG
10	Jurassic Park	127	Action	1993	Universal Pictures	PG-13
11	Lethal Weapon	110	Action Cop & Robber	1987	Warner Brothers	R
12	Michael	106	Drama	1997	Warner Brothers	PG-13
13	National Lampoon's Vacation	98	Comedy	1983	Warner Brothers	PG-13
14	Pulp Fiction	115	Horror	1992	MGM / UA	PG
15	Rocky	120	Action Adventure	1976	MGM / UA	PG
16	Scooby Doo	170	Action Cop & Robber	1983	Universal Studios	R
17	Silence of the Lambs	118	Drama Suspense	1991	Dolby	R
18	Star Wars	124	Action Sci-Fi	1977	Lucas Film Ltd	PG
19	The Hunt for Red October	135	Action Adventure	1990	Paramount Pictures	PG
20	The Terminator	108	Action Sci-Fi	1984	Live Entertainment	R
21	The Wizard of Oz	101	Adventure	1939	MGM / UA	G
22	Titanic	194	Drama Romance	1997	Paramount Pictures	PG-13

The data stored in the ACTORS table consists of three columns: title, actor\_leading, and actor\_supporting, all of which are defined as character columns. The data stored in the Actors table is illustrated below.

Page 1

Figure 20. A “Sample” Paper from LexJansen.com

## SAS Press and SAS Talks Webinars

SAS Press and SAS Talks provide users with a number of effective presentations developed by SAS experts, instructors, authors, customers and students. Users also have for their viewing pleasure a SAS YouTube Channel with thousands of videos in a variety of unique categories: Analytics, Featured SAS Customer Stories, SAS Customer Stories, SAS Visual Analytics, SAS Data Management, SAS High-Performance Analytics, Popular Uploads, and Created Playlists. I always enjoy sharing a cost-effective method of upgrading staff member skills by scheduling monthly lunch-time pizza webinars where staff member view, eat and discuss the merits associated with the techniques they've learned from the webinar. This represents a winning scenario for everyone involved.

### SAS Press Webinar Series

SAS Press provides users with a series of "free" informative Webinars that were developed and presented by authors. These archived webinars can be accessed at, <http://support.sas.com/publishing/bbu/webinar.html>, as illustrated in Figure 21, below.

**TRAINING & BOOKS**

- Books
  - SAS Certification Books
  - Upcoming Titles
  - Author Pages
  - Academics
  - Resellers
  - Publish with SAS
- Training
- Certification
- SAS Global Academic Program
- SAS OnDemand

## SAS Press» Webinars, Videos, and Podcasts

### SAS Press Webinars

#### SAS Press Webinar Series

- [Alex Dmitrienko, 2006](#)
- [Kirk Lafler, 2006](#)
- [Kirk Lafler, 2006](#)
- [Jack Shostak, 2006](#)
- [Michael Raithe, 2006](#)
- [Cynthia Zender and Michele Burlew, 2009](#)

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**Cynthia Zender and Michele Burlew**  
 Topic: Cynthia Zender and Michele Burlew offer their vast expertise in a new Webinar presentation: Output Delivery System: The Basics and Beyond.  
[View the archived presentation.](#)

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**Kirk Lafler**  
 Topic: Exploring Dictionary Tables with PROC SQL  
[View the archived presentation.](#)

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**Kirk Lafler**  
 Topic: Tips and Techniques for Producing Quick Results with PROC SQL  
[View the archived presentation.](#)

Figure 21. SAS Press Webinar Series

### SAS Talks Webinar Series

SAS Talks provides users with a series of "free" informative Webinars that were developed and presented by SAS experts, instructors, authors, customers, and students. These monthly webinars are archived for later viewing by users and can be accessed at, <http://support.sas.com/community/events/sastalks/#s1=2>, as illustrated in Figure 22, below.

HAPPENINGS / SAS TALKS

HAPPENINGS

- Users Groups
- **SAS Talks**
- E-newsletters
- RSS & Blogs

SAS Talks

SAS Talks is a webinar series featuring technical presentations by SAS experts, instructors, authors, customers and students. Monthly live webinars are archived for later viewing, and related resources are offered within each area.



Figure 22. SAS Talks Webinar Series

SAS Support Communities

SAS Support Communities enable anyone to ask questions, exchange ideas, get tips and more. SAS Support Communities can be accessed at, [https://www.sas.com/en\\_us/connect.html](https://www.sas.com/en_us/connect.html), as shown in Figure 23, below.

SAS Support Communities

Our virtual communities enable everyone to ask questions, exchange ideas, get tips and more. Check out these popular communities.



SAS Programming Community

- › What's New in SAS Studio 5.2? Q&A, Slides, and On-Demand Recording
- › Fun with SAS ODS Graphics: Paranormal Density Plot
- › Collecting Feedback on What's New Documentation
- › Tutorials on importing/exporting Excel and SAS data

[Read all posts](#)



SAS Analytics U Community

- › How to Fix SAS OnDemand for Academics: Enterprise Miner Error: "Unable to Launch the Application"
- › Free Online Resources for Educators and Students
- › Git with SAS University Edition
- › How to Set Up SAS University Edition on Amazon Web Services (AWS)

[Read all posts](#)



Administration & Deployment Community

- › EXAScaler Cloud by DDN: A shared file system to use with SAS Grid on MS Azure
- › Upcoming SUGA webinar on moving from SAS 9 to SAS Viya
- › What Are Best Practices for Upgrading to the Latest Version of SAS®9?
- › What Are the Top 10 Tips for SAS® Viya® Administrators? Q&A, Slides, and On-Demand Recording
- › Best Practices for Using Microsoft Azure with SAS®

Figure 23. SAS Support Communities

SAS Support Communities also provides access to SAS Users Groups, as shown in Figure 24, below.



**SAS Users Groups**

Meet local SAS users. Network. Exchange ideas.

Whether in-house, local, regional or special-interest - SAS users groups are independent, volunteer organizations run by SAS users. SAS partners with users groups to provide a wide range of services and support.

[Explore SAS Users Groups](#) ➤

**Figure 24. SAS Users Groups**

Access the latest SAS Blogs, as shown in Figure 25, below.

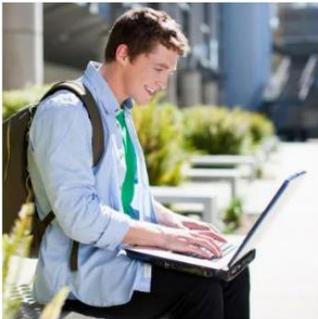
Read the Latest Blogs



**Data Visualization**

- › Identify influential observations in regression models
- › Programmatically export a Visual Analytics report to PDF
- › Control the fill and outline colors of scatter plot markers in SAS
- › SAS graphs for R programmers - bar charts

[Read the blog posts](#) ➤



**Programming Tips**

- › Sample size for the Monte Carlo estimate of an integral
- › To be and not to be - the uncertainty principle in SAS
- › Estimate an integral by using Monte Carlo simulation
- › Programmatically export a Visual Analytics report to PDF

[Read the blog posts](#) ➤



**SAS Viya**

- › Déployer SAS Viya 4 en comprenant ses nouveautés par rapport aux versions précédentes
- › Programmatically export a Visual Analytics report to PDF
- › Automated linearization in SAS Optimization
- › Del análisis manual a la democratización de la analítica de datos

[Read the blog posts](#) ➤

[View All Blogs](#) ➤

**Figure 25. SAS Blogs**

## SAS YouTube Channel Videos

The SAS YouTube Channel is available to all users and can be accessed at, <https://www.youtube.com/user/SASsoftware>. Available video channels include: SAS Data for Good, SAS Life: Our Culture Code, SAS Customer Success Stories, Artificial Intelligence and Machine Learning, Internet of Things, Learn SAS – Training & Support, SAS Solutions, SAS Products & Technology, and SAS Industry Solutions. Images of featured SAS YouTube Channel presentations are shown in Figure 26, below.

**SAS Data for Good** ▶ PLAY ALL

SAS is proud to be part of the Data for Good movement, which encourages using data in meaningful ways to solve humanitarian issues around poverty, health, human rights, education and

 <p><b>ACHIEVING DATA LITERACY IN K-12</b> 2:20</p>	 <p><b>Protecting the Earth's Biodiversity with Artificial Intelligence</b> 4:52</p>	 <p><b>Transforming Mental Health Research with Analytics</b> 3:09</p>	 <p><b>IOM Brings Relief to Nepal with SAS Analytics</b> 3:08</p>	 <p><b>IOM Modernization with SAS</b> 2:17</p>	 <p><b>CREATING A DATA-DRIVEN LEGACY OF INCLUSION</b> 6:51</p>
<p><b>Achieving Data Literacy in K-12</b> SAS Software 420 views • 4 months ago CC</p>	<p><b>Protecting the Earth's Biodiversity with Artificial...</b> SAS Software 465 views • 3 months ago CC</p>	<p><b>Black Dog Institute   Transforming Mental Health...</b> SAS Software 258 views • 3 months ago CC</p>	<p><b>IOM Brings Relief to Nepal With SAS Analytics</b> SAS Software 391 views • 3 months ago CC</p>	<p><b>IOM Modernization With SAS</b> SAS Software 204 views • 3 months ago CC</p>	<p><b>Special Olympics World Games 2019 Creates a Data...</b> SAS Software 376 views • 1 year ago CC</p>

**SAS Life: Our Culture Code** ▶ PLAY ALL

We're problem solvers, explorers and knowledge seekers – always asking, "What if?" At SAS, your curiosity matters – whether you're developing algorithms, creating customer experiences or

 <p><b>THIS IS SAS MARVIO PORTELA</b> 1:57</p>	 <p><b>THIS IS SAS JESS MAYO</b> 1:21</p>	 <p><b>SAS VIRTUAL INTERNSHIP EXPERIENCE</b> 2:22</p>	 <p><b>SAS Life: Intern Edition   SAS Careers</b> 1:34</p>	 <p><b>SAS LIFE: LIMITLESS POSSIBILITY</b> 1:15</p>	 <p><b>your curiosity matters</b> 0:48</p>
<p><b>This is SAS - Marvio Portela   SAS Careers</b> SAS Software 552 views • 2 months ago CC</p>	<p><b>This is SAS: Jess Mayo   SAS Careers</b> SAS Software 460 views • 2 months ago CC</p>	<p><b>SAS Life: SAS Virtual Internship Experience   SAS...</b> SAS Software 1.4K views • 7 months ago CC</p>	<p><b>SAS Life: Intern Edition   SAS Careers</b> SAS Software 1.7K views • 10 months ago CC</p>	<p><b>SAS Life: Limitless possibility   SAS Careers</b> SAS Software 2.5K views • 1 year ago CC</p>	<p><b>Your Curiosity Matters   SAS Careers</b> SAS Software 2.1K views • 2 years ago CC</p>

**SAS Customer Success Stories** ▶ PLAY ALL

92% of the Fortune 100 use SAS | See who's working smarter with SAS. Hear dozens of SAS customers from across many industries explain how their businesses were able to achieve or

 <p><b>LA Kings &amp; LA Galaxy   AI in the Cloud Assists AEG Scor...</b> 4:46</p>	 <p><b>TOWN OF CARY RELIES ON CLOUD ANALYTICS TO PREDICT FLOODING</b> 2:20</p>	 <p><b>ORLANDO MAGIC</b> Improving On-court Performance with SAS 1:07</p>	 <p><b>PRIME THERAPEUTICS</b> Relies on SAS Fraud Framework to Fight Fraud 2:26</p>	 <p><b>OSU</b> Analytics Drive Data-Informed Decision making at OSU 3:46</p>	 <p><b>Management at the Copenhagen Regional Psychiatric Centers   COVID...</b> 1:12</p>
<p><b>LA Kings &amp; LA Galaxy   AI in the Cloud Assists AEG Scor...</b> SAS Software 113 views • 1 week ago CC</p>	<p><b>Town of Cary   Cloud-Based Analytics Helps Town of Car...</b> SAS Software 447 views • 2 months ago CC</p>	<p><b>Orlando Magic   Improving On-court Performance With...</b> SAS Software 930 views • 7 months ago CC</p>	<p><b>Prime Therapeutics   Relies on SAS Fraud Framework to...</b> SAS Software 1K views • 9 months ago CC</p>	<p><b>Oklahoma State University (OSU) - Analytics Drive Data...</b> SAS Software 543 views • 7 months ago CC</p>	<p><b>Copenhagen Regional Psychiatric Centers   COVID...</b> SAS Software 291 views • 8 months ago CC</p>

**Artificial Intelligence and Machine Learning** ▶ PLAY ALL

Artificial intelligence, machine learning and deep learning solutions from SAS are revolutionizing the way we live and work. SAS embeds AI capabilities in our software to deliver more intelligent,

 <p><b>CHOOSING A MACHINE LEARNING ALGORITHM</b> with Aurora 14:10</p>	 <p><b>ARTIFICIAL INTELLIGENCE TRENDS OF 2020</b> 2:27</p>	 <p><b>BUILDING OBJECT DETECTION MODELS</b> with Robert 15:25</p>	 <p><b>SAS DEMO</b> Data Mining and Machine Learning for... with Jonathan 8:20</p>	 <p><b>SYNTHETIC IMAGE CREATION</b> with Robert 11:34</p>	 <p><b>MACHINE LEARNING CODE IN SAS</b> with Christa 24:08</p>
<p><b>SAS Tutorial   How to Choose a Machine Learning...</b> SAS Users 2.7K views • 3 months ago CC</p>	<p><b>Artificial Intelligence Trends of 2020</b> SAS Software 7.7K views • 1 year ago CC</p>	<p><b>SAS Tutorial   How to Build Customized Object Detectio...</b> SAS Users 893 views • 4 months ago CC</p>	<p><b>SAS Demo   Data Mining and Machine Learning for...</b> SAS Software 3K views • 1 year ago CC</p>	<p><b>SAS Tutorial   How to Create Synthetic Image Data</b> SAS Users 1.2K views • 7 months ago CC</p>	<p><b>SAS Tutorial   Machine Learning: A Coding Example...</b> SAS Users 7.2K views • 1 year ago CC</p>

Figure 26. SAS Software YouTube Channel Video Topics

**Internet of Things** ▶ PLAY ALL

The Internet of Things (IoT) is a growing network of everyday objects – from industrial machines to consumer goods to vehicles – that can share information and complete tasks while you are busy



**Forecasting for Success in the New Energy Environment**  
SAS Software  
268 views · 1 month ago



**Predicting Flooding - Protecting Citizens**  
SAS Software  
435 views · 2 months ago



**MANUFACTURING 4.0 at the IoT**  
SAS Software  
450 views · 1 month ago



**Industry 4.0 Revolution Enabled by SAS Analytics a...**  
SAS Software  
447 views · 6 months ago



**IoT is About More than Collecting and Connecting**  
SAS Software  
429 views · 6 months ago



**SAS Event Stream Processing with Kubernetes**  
SAS Software  
1.6K views · 9 months ago

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**Learn SAS - Training & Support**



**SAS How To Tutorials**  
SAS Software  
VIEW FULL PLAYLIST



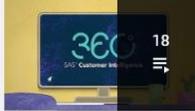
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VIEW FULL PLAYLIST



**SAS Analytics U**  
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**SAS Solutions**



**SAS Customer Intelligence**  
SAS Software  
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**SAS Data Management**  
SAS Software  
VIEW FULL PLAYLIST



**Cloud Computing**  
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**Fraud, AML & Security Intelligence**  
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**SAS Products & Technology**



**SAS Viya**  
SAS Software  
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**SAS Visual Analytics & Visual Statistics**  
SAS Software  
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**SAS Industry Solutions**



**Education Industry**  
SAS Software  
VIEW FULL PLAYLIST



**Retail Analytics**  
SAS Software  
VIEW FULL PLAYLIST



**Small & Midsize Business**  
SAS Software  
VIEW FULL PLAYLIST

Figure 26. SAS Software YouTube Channel Video Topics (continued)

## Conclusion

Technology continues to expand to newer and greater horizons, it is essential that students, professionals, and anyone with a curiosity for knowledge have a way to differentiate themselves from the crowd. The savvy SAS user accomplishes this by accessing the readily available MOOCs and videos with a computer (workstation, laptop or “smart” device), an Internet connection and a web browser, to learn techniques, tips, code examples, and other approaches from the comfort of their living room, bedroom, dorm, office, beach house, or countless other places in the world; downloading and using the “free” SAS OnDemand for Academics software to learn data access, manipulation, programming, statistical, and reporting techniques; accessing a wealth of published conference “white” papers using lexjansen.com; accessing technical content on support.sas.com, and SAS Channel YouTube videos.

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Kirk Paul Lafler is a lecturer and adjunct professor at San Diego State University; an advisor and adjunct professor at the University of California San Diego Extension; and teaches SAS, SQL, Python, R and Excel courses, seminars, workshops, and webinars to students, professionals and users around the world. Kirk has been a SAS user since 1979 and is the author of several books including, PROC SQL: Beyond the Basics Using SAS, Third Edition (SAS Press. 2019) along with papers and articles on a variety of SAS topics. Kirk has also been selected as an Invited speaker, educator, keynote and section leader at SAS conferences; and is the recipient of 25 "Best" contributed paper, hands-on workshop (HOW), and poster awards.

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