Paper 2581-2016

Empowering People to use SAS® as a Weapon for Work Reduction

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ABSTRACT

You have SAS® Enterprise Guide® installed. You use SAS® Enterprise Guide® in your day to day work. You see how SAS® Enterprise Guide® can be an aid to accessing data and insightful analytics. You have people you work with or support that are new to SAS® and want to learn. You have people you work with or support that don't particularly want to code but will use the GUI and wizard interfaces within SAS® Enterprise Guide® …….. and then you have the spreadsheet addict, the one person or group of people who refuse to even sign onto SAS®. This group needs to consume the data sitting in SAS®, they need to do analysis but want to do it all in a spreadsheet. But, you need to retain an audit trail of the data, you have to reduce the operational risk of using spreadsheets for reporting. What do you do? How do you deal with this? This paper hopes to share some of the challenges and triumphs in empowering these, very different groups of people, using SAS®.

INTRODUCTION

We work in a highly regulated environment with internal and external regulators on both sides of the border; we have strict guidelines for data governance that require full audit trails for data, methodology and reporting. We provide operational, analytical and reporting support to various groups using SAS® as our main tool. We are involved in training the groups we support to use these tools to empower them to become more self-sufficient.

Why do we want people to be self-sufficient? Doesn't a more self-sufficient business group mean less job security? Definitely not. We don't want to be stuck running the same tasks over and over again, it is boring. During busy times we become a bottle neck, once we are seen as a bottle neck then we are seen as a problem. The more repetitive tasks we can move back to the business, the more time we can spend identifying new areas to simplify. We want to be innovative, we want to do more interesting work, we want to be seen as a solution, not a problem, and this is where we see our job security. Having more time frees us up so we can do insightful analysis and not reactive reporting.

The most rewarding part is when you develop tools for people to make their work faster and simpler, the most challenging part is when they just won't use them. In this paper I hope to share the different training techniques we have used and solutions we have implemented using SAS® in trying to win these people over.

TYPES OF USER

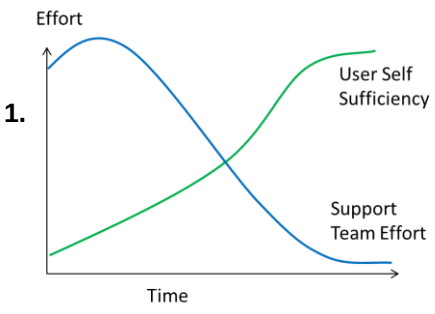
Generally we can categorize our users into three groups:

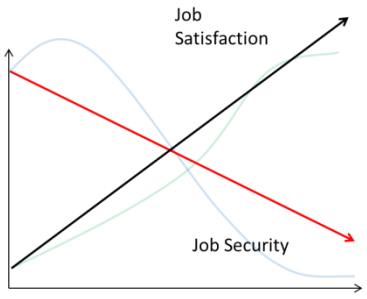
1. **Power User**: use SAS® every day; are self-motivated; want to learn; want to do their own analytics; sometimes need help with specific task, efficiencies or data explanations; are easy to teach and independent.

   The effort to get a power user up to speed understanding the process, data structure and environment is intensive up front but the support effort decreases as self-sufficiency increases. Job satisfaction rises, progress is seen and time is freed up for more interesting tasks, job security decreases over time because less support is required.

Figure 1: Effort vs. Satisfaction

1.

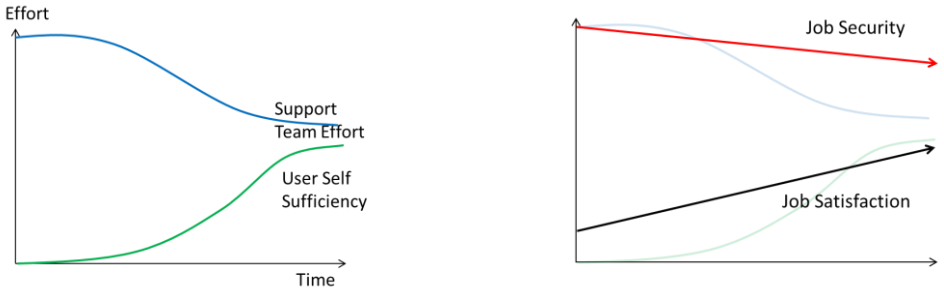




2. **Occasional User**: usually come with little or no SAS® knowledge; need access to the data during certain cycles; don't want to learn how to code but will use canned queries and reports and are willing to learn how to execute them; are happy to use tasks and wizard features in Enterprise Guide®; want to be independent, require training and specific tools developed for them to use.

   The effort to get an occasional user up to speed understanding the process is intensive up front, but as knowledge is acquired, and self-serve support tools are set up, the support effort decreases. The user can execute with little or no support, development and identification of new processes to increase efficiencies continue to require effort. Job satisfaction increases as more manual tasks disappear; job security remains because identification for new development and maintenance for existing processes will remain.

Figure 2: Effort vs. Satisfaction

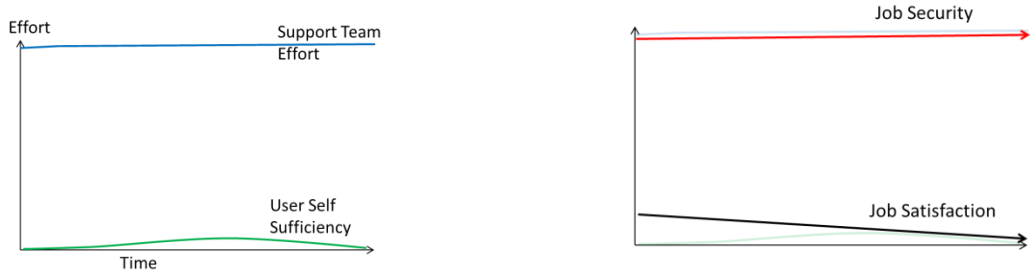


3. **Reluctant User**: just want the result…. in a spreadsheet; don't want to "program"; no matter what is done there is just no interest; not even to open Enterprise Guide®.

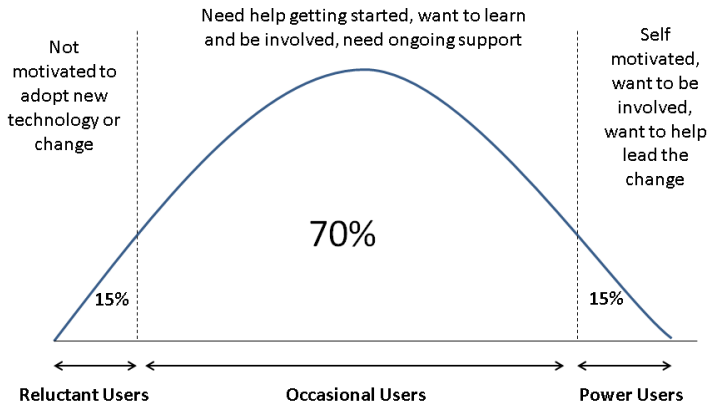
   The upfront support effort is intensive and doesn't change; just want the results provided; don't want to understand process or how to do things for themselves; all effort ends up being ad hoc regardless of how much planning is done the user is not engaged so everything becomes last minute; there is no desire to be self-sufficient.

   Job security remains high; job satisfaction is low, work is unplanned, repetitive and boring.

Figure 3: Effort vs. Satisfaction



SUMMARY OF USER TYPES



Fortunately the majority of users want to learn; want to be involved and given the right tools and training can become more self-sufficient. Some users are self-motivated, self-reliant and need little or no support; others are more frustrating to deal with.

LEARNING APPROACHES

Learning is two sided. To be able to teach we need to learn what is required and where the knowledge gaps are. The following learning approaches apply to all user types but categorized where they have been most successful.

1. **Self-Motivated people with a good solid knowledge of SAS:**

   - **SAS resources:** Classroom training, e-learning, free tutorials, SAS communities, white papers from past conferences. We take full advantage of these resources but like many departments are limited somewhat by a budget.
   - **SAS User Groups**: We are fortunate enough in Toronto to have several active user groups that are: industry specific (Health User Group); function specific (Toronto Data Mining Forum) as well as general (Toronto Area SAS® Society). These groups are invaluable for networking with peers and experts as well as a way to share your knowledge with less experienced programmers, you always come away learning something from these meetings regardless of your level if SAS® expertise.
   - **Internal User Groups:** Groups set up within organizations to support internal users are excellent for networking, knowledge sharing as well as the opportunity to get installation and environment specific help. Knowing who to go to; who understands the data; how to access it and how the technical environment operates can all help avoid costly and frustrating delays.

2. **Need Inspiration:**

   - **Lunch and Learn:** We have been fortunate to be able to partner with SAS® who come and cover specific topics and lead discussions. We also lead our own sessions: structured sessions where we set agenda; and free form sessions where we will set a general outline but ask people to submit subjects or problems before the session or bring them to the session and work through specific issues. We try to provide material to reinforce what we have demonstrated in the form of tip sheets, how to guides and always ask for feedback.
   - **One on one training**: This is usually two sided, first we will sit down with the user and identify areas of frustration, interest or specific need that they have expressed or that we have observed.

From these initial discussions we can usually identify specific areas for training, but also identify areas that we can provide better tools to make things simpler. One on one training allows the user to not only ask specific questions that they might not otherwise ask in a more formal or public setting but also helps to build relationships between the two groups.

- **Project post mortem**: In the 'what didn't go well' part there are usually opportunities to identify areas for improvement, areas for development or just simply areas to simplify process or communication. Comments like "it took me three days to generate graphs and charts that I needed for the final deck" is an opportunity for us to see that data that we have provided as an extract (maybe the initial requirement was only the extract) is used in a downstream process that we were unaware of, this allows us to add value to the process and help automate from start to finish.
- **Secondment from business area**: We support groups in the same building but on different floors, in different buildings and in other countries. We have had success when temporarily relocating a resource to come and sit with us on our floor. This has been a great experience for us. We have been able to provide one on one support and training, it is simple to ask a question when you sit next to someone, rather than going to the effort of calling, leaving a message and waiting for a response. There is much more interest in learning how to do something when you can see results straight away. This works both ways, we have a much better appreciation for what our users are trying to do, we are able to see what is being done with the data and are able to offer and provide a better service now that full cycles of work can be observed. Often our users ask for what they think they want and what they think we can give them and not what they want the end product to be. When we observe the work we are in a better position to suggest alternative ways to do things or provide what the end result is rather than something that only gets you part the way there. The intention is that when the period of collaboration is over then we are sending someone back into the group that has had exposure to the overall process, a better understanding of data as well as how to extract and use that data. The intent is that they will share that knowledge back with their team and become the first point of call.

3. **Reluctant:**
    - **Day to day observations**: If are you always being asked the same questions over and over again or similar questions by different people then there is obviously a need to provide a better understanding or tools to answer those questions. To have good communication with your user group allows you to add value. Often they don't know what you can do for them or even what to ask for. By observing what their day to day work involves allows you to see opportunities, if someone asks for data, what else do they do with it, can you actually provide the data but also the table in word or the graph into a presentation?

LEARNING APPROACHES – LESSONS LEARNED

1. **SAS Courses –** show interest before you invest. SAS has many many free online resources. When someone shows they are willing to take advantage of free resources then it shows motivation and commitment, these are the people worth investing in.
2. **Lunch and Learn** – don't provide lunch. You get a room full of people but some are only there for the food. Make it brown bag and the people who want to learn turn up and are engaged. People who are there just for the food get bored and can be a distraction for the people who want to learn. Alternate presenters and points of view, having a variety of people with different skill sets and objectives will allow people to see that there is always another way to do things or look at things. It keeps things fresh.
3. **One on One Training** - this is the most successful but most time consuming approach. Always schedule a follow up, try to leave a hands on exercise, tip sheet or some form of reinforcement for what was taught. If you walk away from training someone and they don't use or apply that learning

then it was not successful. Follow up and see if any of the learnings have been used, if not why not, was something missing, not clear. Follow up is a useful learning tool for the teacher and a measure for success.

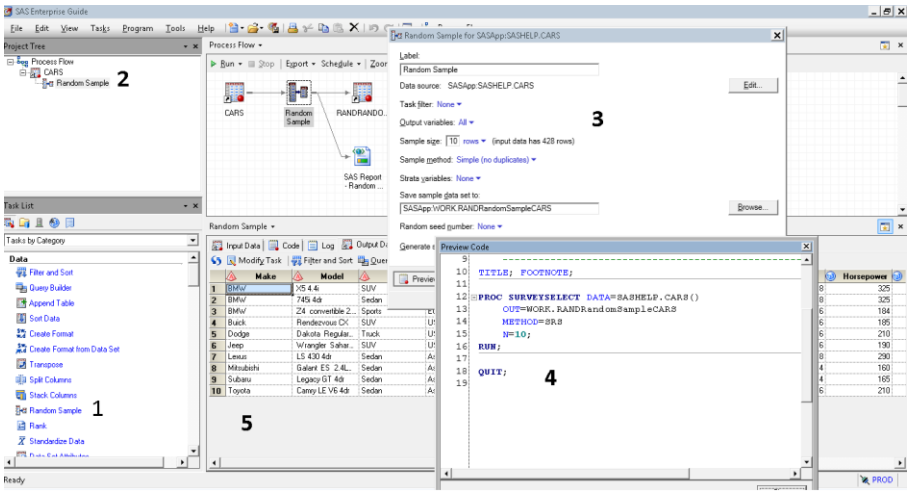
4. **Project Post Mortem** – make sure you follow through. There is nothing worse than "another post-mortem meeting" where nothing is done. If people see results and see this as a forum for problem solving then they will be more likely to participate. If people see no results, then you get low participation and if we don't learn from our mistakes we are doomed to repeat them.
5. **Secondment** – make sure it is the right person. It must be someone who is being supported and wants to be there.
6. **Day to day observation** – not everyone wants to be told that there is a better way to do it or that they are being inefficient, make sure that any suggestions are seen to be collaborative and not forced.

SAS TOOLS USED

Enterprise Guide® – Tasks: this is the obvious choice for our power users and to some extent our occasional users. It is quick to get them started and in only a short amount of time we can get someone up and running, we have our libraries pre-assigned so that as soon as someone logs on they have access to the most of the data they will need and can point and click their way through most SAS® procedures using the pre-defined tasks available to them. The beauty of using the pre-defined tasks is a wizard walks the user through the process without writing code and at the end the SAS® code is generated. This then turns the tasks into a teaching tool for people who want to take that task further – use a task to get your basic code together, copy and paste the code into a code node then play with the options to get the output you want, or integrate it into a more complex piece of code.

Example 1: Enterprise Guide® Task

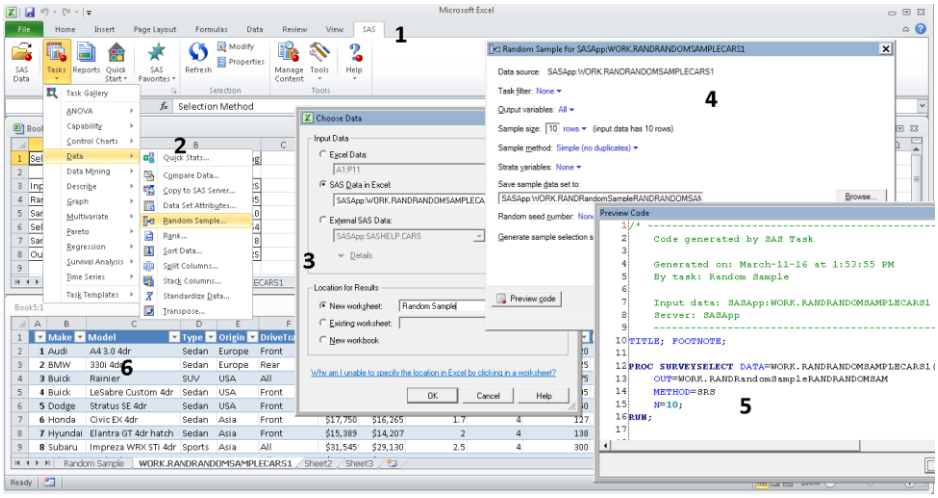
1. Select Task
2. Select Data
3. Review/Edit task panel
4. Preview code (optional)
5. Execute



SAS® Add in for Microsoft Office® - For the person who cannot do without a spreadsheet, the SAS® Add-in is invaluable. Simply pull a dataset into your worksheet; pull the data in as a pivot from SAS® Olap cubes; use the SAS® Tasks. This tool definitely helps bridge between SAS® and excel. We have used this tool successfully to pull through pre canned reports, launch stored processes, link cube data into excel templates. We find this tool is great to get people introduced to SAS® functionality in an environment where they feel safe and they are familiar with.

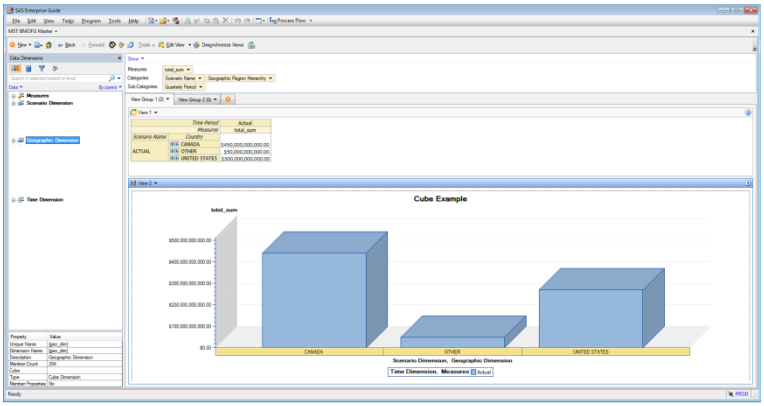
Example 2: SAS® Add in for Microsoft Office®

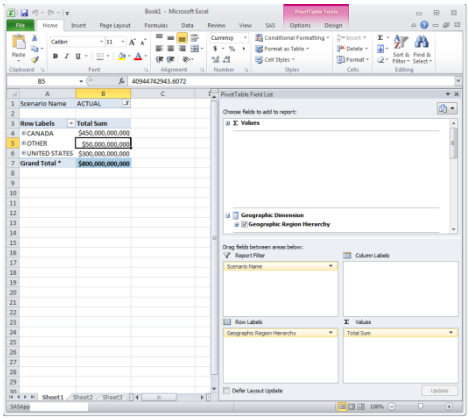
1. Select “SAS” Tab
2. Select Task
3. Select Data
4. Review/Edit task panel
5. Preview code (optional)
6. Execute



SAS® Olap cubes -Cubes are something that has really made point and click, drill down analytics simpler. In the past summary results were created then exported into a spreadsheet, pivots created in the spreadsheets and report templates liked to these pivot. Now the data is all linked directly to the cube meaning the template is refreshed when the file is opened. A cube viewed through a spreadsheet looks just like a pivot table. Using the cube viewer in Enterprise Guide® provides an intuitive interface for quick access to slice and dice and explore data for business analysis. It features drillable, interactive graphics and enables users to generate ad hoc queries based on the cube data. It can be as simple as drag and drop to see results, you can build reports that can be executed from Microsoft Office® products; create standard views as bookmarks so they appear when you open a project; add calculated measures (e.g. simple calculations, counts, time series analysis) into multidimensional data. The ability to filter based on ranking, ranges or creating custom filters is all supported through the interface.

Example 3: SAS® Olap cube from Enterprise Guide® and Add in for Microsoft Office®





Canned queries – For users who are confident enough to use SAS® code but are not confident enough to write more complex queries we provide a basic query structure that they can modify to add criteria, additional columns, measures etc.. Typically canned queries are a stepping stone to a more stable structure. Once a format has been established and works we try to move it into a macro or stored process.

Shared macros - For users who have the confidence to go into Enterprise Guide® and execute a line of code. Shared macros can be stored in a central location, can have controls around who has access and what type of access, this makes it much easier to control the code that users execute while still allowing them the flexibility through parameters. Like canned queries these are usually a stepping stone. If a particular macro is useful to our more sophisticated users then we will look at whether we can simplify the execution through a stored process for our more occasional users.

Stored processes - Stored Processes are our best friend for all our users. A stored process allows us to build complex code but still allow our users to select parameters that are applied to the code. It is a way to apply change control as well as lock down business rules and code but still allow the users the flexibility they require. We deploy stored processes through SAS® Enterprise Guide® but also through our intranet which then means you can just simply create an icon for the user and they don't even have to open a SAS® application.

SAS TOOLS – LESSONS LEARNED

Enterprise Guide® – Tasks need the right audience. If someone really is opposed to "coding" or thinking they are being "changed into a programmer" then opening a development environment probably isn't the right tool. But for the other 85% of users this is an excellent tool. People who are unfamiliar with SAS® code can start up a session and execute SAS® Procedures, queries, filter and explore the data with little to no programming experience. Making sure people have libraries pre-assigned was a big win, the less someone has to do to get started the more likely they are to adopt. Making sure people are familiar with the data is one of the biggest lessons learned. Having them understand the amount of data they are pulling and how to limit observations early in the process is critical in avoiding long running processes.

SAS® Add in for Microsoft Office® - Pre-assigned libraries are key here. Typically people using the Add-in are not coders, not particularly interested in setting up anything so want everything to work when they open their spreadsheet. It is key to ensure the functionality they are looking for works exactly the way you explain and they understand prior to presenting.

SAS® OLAP cubes - We made some mistakes at first; for example: to think we could have one cube that met all requirements; the result was that we had one huge cube that no one could use; build time was slow; response time through the Add-in was slow, response time through Enterprise Guide® was slow and we just ended up having to create extracts of data from the cube summary data that got exported into Excel and used as a pivot. Anyone who didn't want to use SAS® now had the perfect excuse not to use it and it didn't matter what we did, this initial experience was always referred back to – even by people who were not working in the department at the time which shows that a negative experience lasts much longer than a positive one.

Canned queries – Great quick wins. In the wrong hands are dangerous. We found canned queries can act a little bit like "broken telephone". You provide a query to someone, who changes it a bit, passes it on, it get changed again and again, then you get given two numbers and told that your query was used to create both so why they are different. Be very very careful who you give "raw code" to play with.

Shared macros – A great way to share canned code, and apply change control. Not everyone is comfortable using or executing macros so if presented to the wrong audience can intimidate and confuse.

Stored processes – make sure they are documented and have user guides and are intuitive. People need to know what the purpose is and what is supposed to happen and approximately how long it will take and how they will get their results. If someone can't easily find a stored process or they execute something that they think will return results instantly but will actually take minutes to run will frustrate people. Did it work? Why is it taking so long? If the results create an external spreadsheet then make sure something is returned to the user – a message to say the process is complete or return the results to the screen so they can see something. Nothing is worse than if you left hanging.

PERSONAL LESSONS LEARNED

DO NOT ASSUME:

Assuming everyone has the same drive: Not everyone wants to learn how to code, not everyone sees improvement the same way, not everyone wants to change.

Assuming everyone has the same ability: Some people just don't want to code or program no matter how simple, others have an aptitude and need little encouragement. There is not a magic answer for everyone.

REVIEW AND UNDERSTAND USER REQUIREMENTS:

Tailor the solution to the problem: sounds simple but identifying the problem is the biggest challenge, many times a request is made and simply responding with an answer is not always the fastest thing to do. A quick conversation about why and what the user intends to do with the result can save hours of rework or worse misinterpreting what they want and providing misinformation.

REVIEW AND UNDERSTAND USER CAPABILITIES:

Tailor the solution to the ability: if someone isn't going to use something you develop then it is just as bad as not doing anything for them at all. Make sure that whatever you create can be used.

Take the time to understand the user: the more reluctant they are to change the more careful you have to be to make sure they are involved in the change and don't feel forced into it.

CONCLUSION

Power users are great, easy to please and require little effort and support. Occasional users require more thought, structure and control around processes; continue to need support but are generally a positive experience. Reluctant users are the most frustrating people to work with, especially when your task is to get them integrated into the work stream using SAS®. In being the biggest challenge there is always a way to turn it into a reward, the bigger the challenge the bigger the reward. If you can get someone who point blank refuses to use the technology available to them, but you are able to get around this and deliver a tool that allows them to work within their comfort zone but also integrates them into the work stream then it is definitely a satisfying feeling. We have become more innovative when dealing with these people because we are forced to see around the problem – or see it from their perspective which always makes you think through things in a different way. The experience is not always positive but have learned to have more patience, have learned to document everything, have learned new ways to do things, have improved skills and have provided increased functionality and support to other users.

The best thing about using SAS® is that it won't let you be beaten, there is always a way to get what you want, you may not win all your battles, but with SAS® on your side the war is definitely yours to win.

REFERENCES

Rogers, E. M. (1995). Diffusion of innovations: Fifth edition. New York, NY: The Free Press, a division of Simon and Schuster, Inc

"Free SAS Tutorials" Available at http://support.sas.com/training/tutorial/index.html

RECOMMENDED READING

- *SAS® Stored Processes http://support.sas.com/rnd/itech/doc9/dev_guide/stprocess/*

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