

Paper PA-85

Teaching SAS® Using SAS® OnDemand Studio and Enterprise Guide

Charlotte Baker and C. Perry Brown, Florida Agricultural and Mechanical University

ABSTRACT

The server based SAS® OnDemand offerings are excellent tools for teaching SAS® coding to graduate students. SAS® Enterprise Guide OnDemand and SAS® Studio OnDemand can be used to accomplish similar educational objectives but the resources required to use each program can be different. This paper will discuss why one might use a SAS® OnDemand program for education and the pros and cons of using each program for instruction.

INTRODUCTION

Educating students to use SAS® for data analysis and data management is an important part of creating a capable workforce. Though many skills can be self-taught, it is important to bring formal SAS® course access to students. Thus it is important to look into avenues that make teaching and learning easier for students and instructors alike.

The SAS Institute Inc. offers SAS® OnDemand for Academics as a free mechanism for teaching, learning, and research. Current SAS® OnDemand offerings include Enterprise Guide, Enterprise Miner, Forecast Server, and Studio (previously named SAS® Web Editor). SAS® OnDemand Enterprise Guide and SAS® OnDemand Studio both rely on an online server for access to the latest SAS® technology and can be used for teaching beginner and intermediate SAS® skills.

While both platforms can be used for teaching, there are several differences between SAS® On Demand Enterprise Guide and SAS® On Demand Studio. This paper will explore some of these differences and some similarities that may be useful for decision makers interested in alternatives to installing SAS® 9.x and/or SAS® Enterprise Guide for teaching and learning.

SIMILARITIES BETWEEN THE PLATFORMS

SAS® OnDemand Enterprise Guide and SAS® OnDemand Studio both allow users to create graphics and to run frequently used SAS® procedures, including PROC CONTENTS, PROC DATASETS, PROC FREQ, and PROC MEANS. The SAS® survey procedures also run on these platforms. Both platforms require internet access and a sas.com account.

CREATING NEW COURSES

It is very easy for teachers to register for a SAS® OnDemand account and create new courses. Documentation explaining how to register and how to create a new course is available and very detailed. Once a teacher has created a course, they can use the resources of SAS® OnDemand even if they have no active courses. For example, you may want to create a new data set or subset existing data for eventual use in a course using SAS® OnDemand. Each user, teacher and student, is given personal space on the SAS® server. Because no one else can access this space it is well suited for a teacher to manipulate data and code before making either available for students or for students to save their own in-progress work. Users can import data and code to this personal space, create a library for this space, and export data and code from this personal space. Once the data and code is exported, it can then be uploaded to the server for the class you are teaching (denoted on the server as "my_content" to the instructor and a folder including the instructor's user name to students). There is not currently a way to directly move data from the personal space to the server space. Students cannot delete data from the class server space but teachers can. As of August 2014, teacher access for uploading or removing files to the class server space has changed from FTP access to SAS® Studio access. The benefit of this change is that no third party program is needed and it is easy to upload and move files around using the SAS® Studio interface (described below). Additionally, students and teachers can delete data from their personal space on the server from within the SAS® OnDemand platform.

STUDENT ACCESS TO AVAILABLE COURSES

Prior to August 2014, students had a limited time to use SAS® OnDemand if they were not registered for a course. While this is still true with SAS® OnDemand Enterprise Guide, it is not true for the recently rebranded Web Editor (now SAS® Studio). Anyone can now access SAS® Studio for noncommercial purposes without being registered for a course. In the event that either platform is being used for teaching, students cannot access a class server space without being registered for that course. If you have students working with you long term and need to upload programs for them to use, it is best to create a course that has a long duration. When developing a course, it is best to know what type of computing systems your students will be using so you can select which platforms you need to

make available for students (if any) in addition to Studio. SAS® OnDemand Enterprise Guide and SAS® OnDemand Studio have different platform requirements (addressed later in this paper). The August 2014 update removed the need to create multiple SAS® OnDemand courses for the same class just to provide access to the different platforms.

THE NECESSITY OF THE LIBNAME STATEMENT

In order for students or teachers to access the course location within the SAS® OnDemand platform, they must use the given LIBNAME statement. This LIBNAME statement is provided when teachers register for a course and can be accessed anytime from the main website for SAS® OnDemand. Bookmarking this website is suggested, as it can be rather difficult to find the appropriate login page from the SAS® website. No how many courses you are teaching or how many platforms you are using, as of August 2014 you will only have one LIBNAME statement to use. This makes it easy to prevent confusion to both the instructor and the student to find the course information. However, this does mean that all of the material the instructor loads onto the course location on the server is available to students in every course that instructor teaches. This could be problematic if you teach multiple sections and do not want the material available before class, if you teach the same class each semester, or if you teach multiple courses at once. Two potential solutions are to create a folder for each course and to remove data from the server at the end of the term.

IN CLASS USAGE

While teaching with SAS® OnDemand, either platform allows in class access as long as computing platform requirements are met and an internet connection is available. If you put code on the server and data to go with the code on the server, students can see how things work and manipulate the code as they go through the course. Data can be uploaded in any format including Microsoft Excel, ASCII, text, and CSV. We installed SAS® OnDemand Enterprise Guide 4.3 on approximately 45 computers in a computer laboratory for the express purpose of using it to teach SAS®. We also had students access SAS® OnDemand Studio in class from their own computers when holding class outside of the computer laboratory. We encountered fewer difficulties with the software when using SAS® OnDemand Studio but students without personal computers were unable to participate to the same level during class. For this reason and because we did not require that students own laptop computers, using a computer laboratory was better. Results from programs can be output in all of the formats available from SAS® 9.3 and SAS® Enterprise Guide. Both platforms provide the ease of programming without necessarily knowing how to program that users of Enterprise Guide sometimes cite as a benefit. Both platforms include shortcuts that can be used as built in programming lessons in class and both provide predictive coding assistance such as that found in Enterprise Guide.

After testing each platform separately and in combination, we found it was preferable to have a single program used for the entire class just for ease of personal memory and to limit student confusion. Depending on the availability of computer systems, this may not be an option. More advanced students may choose to download materials from the server and use them in SAS® 9.x or SAS® Enterprise Guide if those are available for their use.

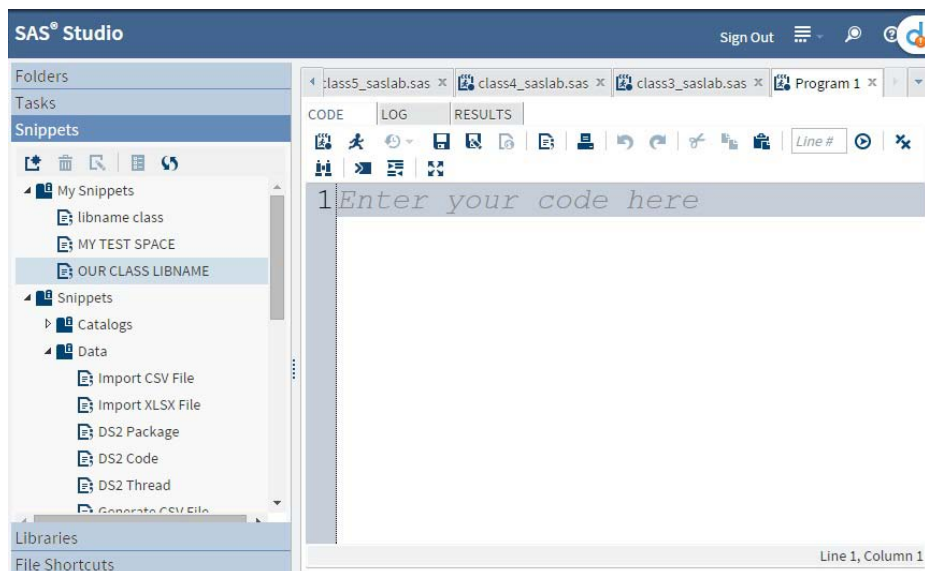
PLATFORM ISSUES

Both SAS® OnDemand Enterprise Guide and SAS® OnDemand Studio can handle large datasets. After the August 2014 transition to SAS® OnDemand Studio, the only two issues continuously encountered when using datasets over 50,000 observations were a popup warning about large size result files and slow server speed for processing. The warning can be disabled. We experienced a few server outages. SAS® operates an OnDemand listserv to notify users about scheduled maintenance and outages. The listserv notified us early enough to inform students and make changes to the syllabus if necessary. We did have some students that faced account login issues (handled quickly by the SAS® help desk) and occasional outages that did not seem to be lab wide or server wide. Almost all of these issues occurred while using SAS® OnDemand Enterprise Guide (both version 4.3 and version 6.1) and immediately after transitioning to Studio (from Web Editor). Outages did not occur with as much frequency when using SAS® OnDemand Studio after server updates were made but still were more frequent than with Web Editor. However, over time we expect this to improve and have had great support from SAS® support in resolving issues.

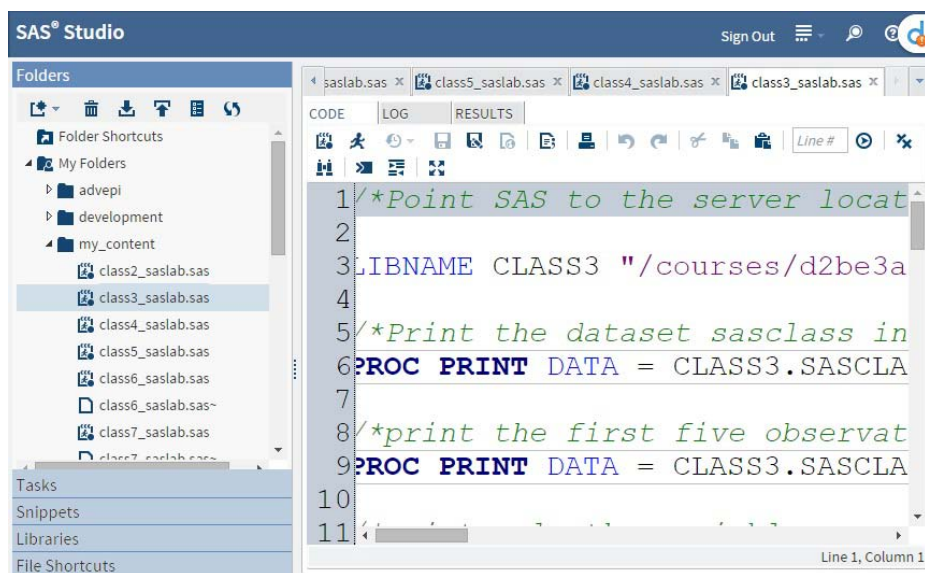
SAS® ONDEMAND STUDIO

SAS® OnDemand Studio is a newer offering for the SAS® OnDemand for Academics program. While the main program features such as the ability to write programs are the same as with the SAS® OnDemand Enterprise Guide, this platform stands by itself. The first noticeable difference is that SAS® OnDemand Studio is web-based platform that can run on almost any computing platform that has a browser installed. We noticed no differences using the program in Microsoft Internet Explorer, Google Chrome, Mozilla Firefox, or Apple Safari. Students with Mac computers were very excited that they could use a SAS® program on their computer without a virtual machine. This means that they were not required to be on campus to finish assignments.

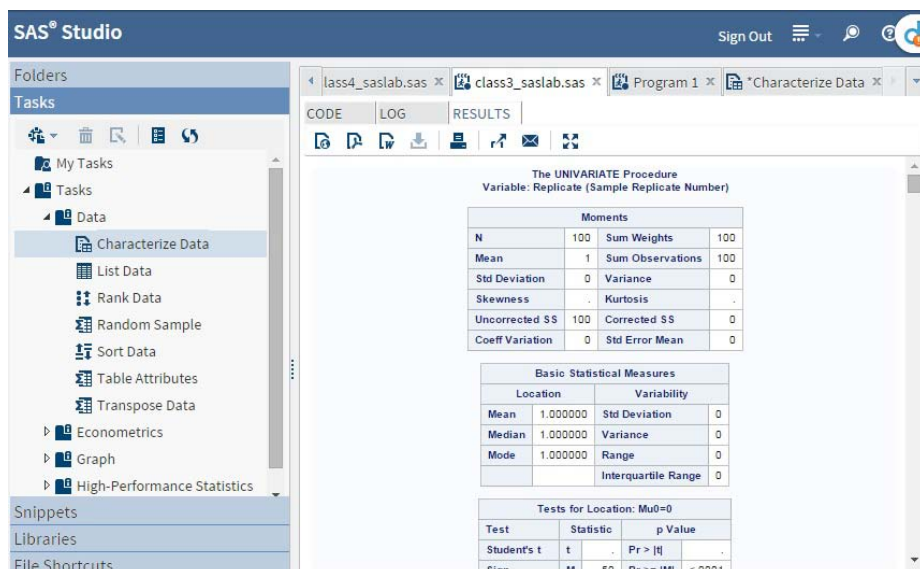
The second noticeable difference is that the graphical interface is much different. The view reminds one very much of SAS® 9.x. It is very neat and clean in appearance. Many things can be done by just clicking with a mouse, such as exporting the results to PDF or RTF. It is easy to find shortcuts on the leftmost panel, such as snippets (great place to save the given LIBNAME statement!) and data locations. To download files from Studio, one can point and click a download button (a down arrow). To add files, one can click the upload button (an up arrow). These two features make it much easier to access files on your computer or flash drive and to put files in a second location. SAS® OnDemand Studio can easily run most ODS statements. SAS® OnDemand Studio also remembers what you were working on and opens those files when you log in. You are given a reminder before you log out that a program is unsaved but files are not auto saved upon logout. To copy, cut, and paste code, it is necessary to use keyboard shortcuts (for example, CTRL-C to copy on a Windows computer) instead of right-clicking with a mouse.



Display 1. The Program Window and Snippets Sidebar of SAS® OnDemand Studio

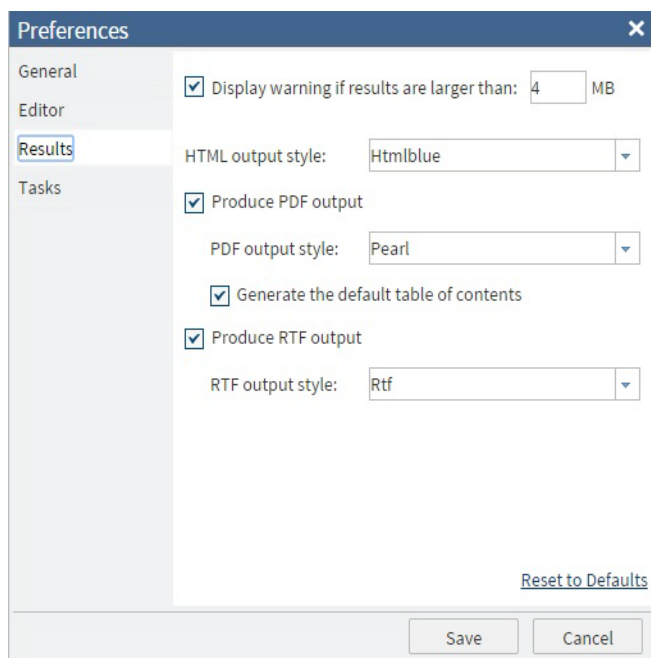


Display 2. The Program Window and Folders Sidebar of SAS® OnDemand Studio



Display 3. The Results Window of SAS® OnDemand Studio

SAS® OnDemand Studio has far fewer customization options than SAS® OnDemand Enterprise Guide. One option, for resizing text, works well for the program window but there is no easily identifiable option to resize the text for results. This is a downside for classroom use. Students sitting far from the screen have a difficult time reading the output. We found it was easier to export some results to PDF and then show them larger in a screen with highlights calling attention to the important area.

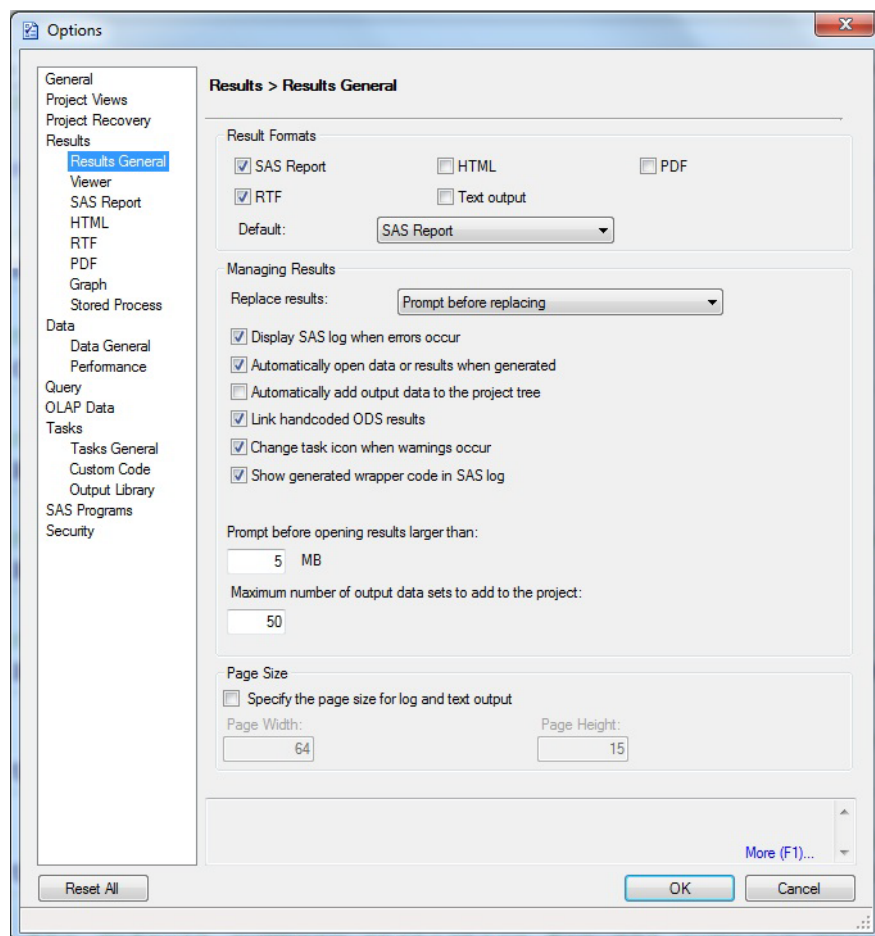


Display 4. The Results Preferences Options for SAS® OnDemand Studio

Finding the physical location of a user's personal space is much easier in SAS® OnDemand Studio than it is in SAS® OnDemand Enterprise Guide. This can be done by clicking the properties button at the top of the panel or right clicking on a given file in the left hand panel, going to properties, and then copying and pasting the location that appears. This location is one that can be inserted into a LIBNAME statement if one is interested. Basic graphics, such as histograms and box plots, can be created by coding. Users also can install very small files to have access to the Graphics Designer and the Graphics Editor from within Studio.

SAS® ONDEMAND ENTERPRISE GUIDE

SAS® OnDemand Enterprise Guide can be used on older Windows computers (pre Windows 7) if one has access to version 4.3. If one is using a lab where they do not have the ability to install or use newer browsers, SAS® OnDemand Enterprise Guide is the platform to choose. The layout is almost an exact copy of SAS® Enterprise Guide. Users can change default settings for the program including one that will automatically export results in any format desired. For example, if you want your results as HTML, PDF and RTF, you can check boxes and make each one happen without using ODS statements. This makes it a one step process to download the results to the computer.



Display 5. Options Window for SAS® OnDemand Enterprise Guide

If you have SAS® 9.x or SAS® Enterprise Guide installed and choose to install SAS® OnDemand Enterprise Guide on the same computer, it is necessary to change the computer file type defaults back to the non-OnDemand installation. If this is not done, each time you try to open any SAS® file, SAS® OnDemand Enterprise Guide will load. There are also known issues when any combination of OnDemand and non-OnDemand versions are installed on the same machine but it is possible to do so. There are issues using the PROC IMPORT and PROC EXPORT statements in SAS® OnDemand Enterprise Guide. These issues are avoided by using the import and export wizards (not available in Studio). Also not available with Studio is the ability to type a program without being connected to the SAS® server. You cannot save the program to the server while not connected to the internet in SAS® OnDemand Enterprise Guide or obtain output but you can save the .sas file elsewhere on your computer. Finally, the ability to find the location of a user's personal space and access a user's files on the server is more difficult in SAS® OnDemand Enterprise Guide than in SAS® OnDemand Studio but it is possible by navigating through the servers list in bottom lefthand corner of the window.

CONCLUSION

SAS® OnDemand Enterprise Guide and SAS® OnDemand Studio have proven to be great substitutes for SAS® 9.x and SAS® Enterprise Guide for teaching beginning and intermediate SAS® skills. This is especially true when a) instructors want to easily share data files and coding examples, b) education takes place in a laboratory setting, or c) students are using non-Windows computers. Both platforms include great user support for faculty and students and plenty of help files for getting started. If one prefers the ease of not installing another program or working on Apple computers without a virtual machine, SAS® OnDemand Studio (SAS® Studio) is preferable. If one is working on a variety of computers including ones with older operating systems or in a laboratory setting, SAS® OnDemand Enterprise Guide is preferable. A combination of the two may work best for teaching so that accommodations can be made for most possible computing situations. In the future, the SAS® University Edition may overtake both options as a preference for teaching.

RECOMMENDED READING

- SAS Institute Inc. SAS® OnDemand for Academics Instructor User's Guide, Third Edition. SAS Institute Inc. 2012. Available at <http://support.sas.com/ondemand/manuals/AcadInstrucManual.pdf>
- SAS Institute Inc. SAS® OnDemand for Academics Student User's Guide, Third Edition. SAS Institute Inc. 2012. Available at <http://support.sas.com/ondemand/manuals/StudentManual.pdf>
- SAS Institute Inc. SAS® OnDemand for Academics Training and Usage Videos. SAS Institute Inc. 2014. Available at <http://support.sas.com/ondemand/videos.html>

CONTACT INFORMATION

Your comments and questions are valued and encouraged. Contact the author at:

Charlotte Baker
Florida A&M University Institute of Public Health
1515 S. Martin Luther King, Jr Blvd
Tallahassee, FL 32307
charlotte.m.h.baker@gmail.com

C. Perry Brown
Florida A&M University Institute of Public Health
1515 S. Martin Luther King, Jr Blvd
Tallahassee, FL 32307
perry.brown@famu.edu

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.