

SAS[®] Viya[®] for Learners: Instructor/Student Notes for Supervised Machine Learning Procedures Using SAS[®] Viya[®] in SAS[®] Studio

This course contains the following lessons:

- Lesson 1 – **Introduction to SAS Viya, Data Preparation, and Exploration**
- Lesson 2 – **Regression**
- Lesson 3 – **Decision Trees**
- Lesson 4 – **Neural Networks**
- Lesson 5 – **Model Assessment**
- Lesson 6 – **Support Vector Machines**
- Lesson 7 – **Bayesian Networks**
- Lesson 8 – **Factorization Machines**

Each lesson contains several sections of study related to the overall lesson's theme. After each section, where applicable, an instructor-led demonstration and student activities provide immediate hands-on exposure to the application. At the end of most lessons, a practice is available that enables students to continue to leverage the skills learned in the lesson.

Global Note: The sign-in credentials of **Student/Metadata0** are not available.

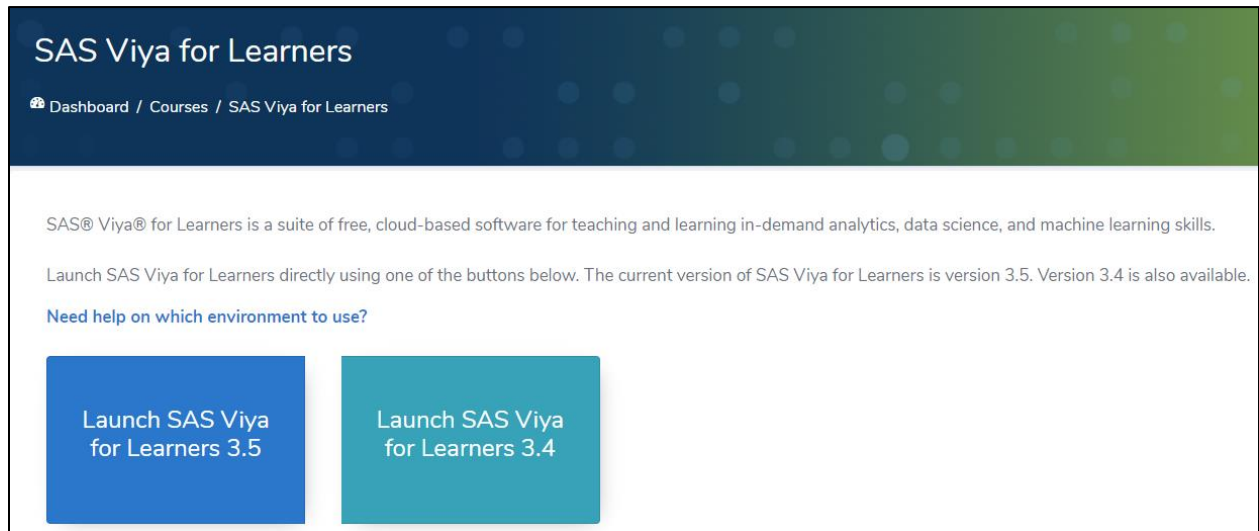
In the SAS Viya for Learners environment, there are certain changes in the programs that are shown in the DMML35 course notes. These programs have a different directory in the LIBNAME statement, use a macro variable that defines the home directory to which score code will be written, use a modified CODE statement, and use a modified %INCLUDE statement.

To access the course:

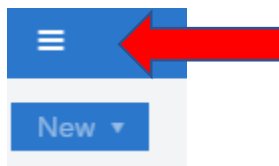
1. Go to the SAS Viya for Learners internet site and sign in with your email address.
2. If you are an Educator, click **Access for educators** on the SAS Viya For Learners home page.



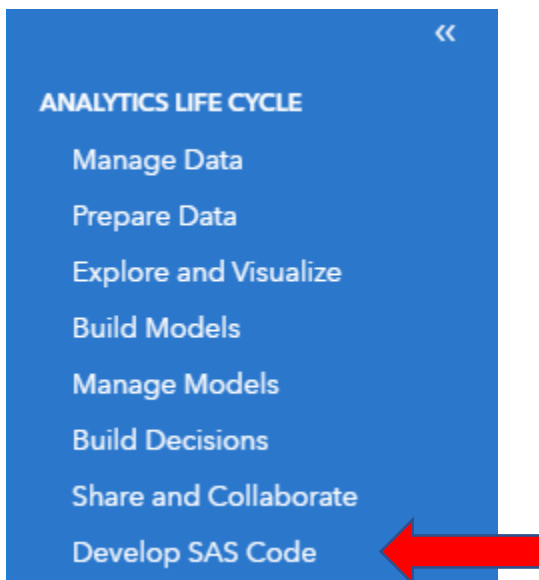
3. Select **Launch SAS Viya for Learners 3.5** to access SAS Viya 3.5.



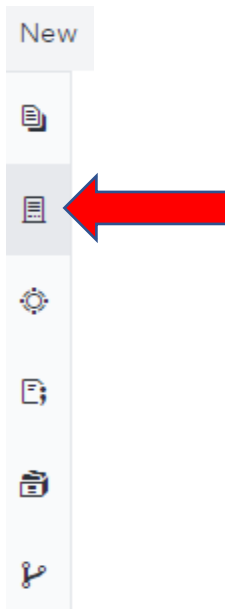
4. To access SAS Studio, click the icon in the upper left corner.



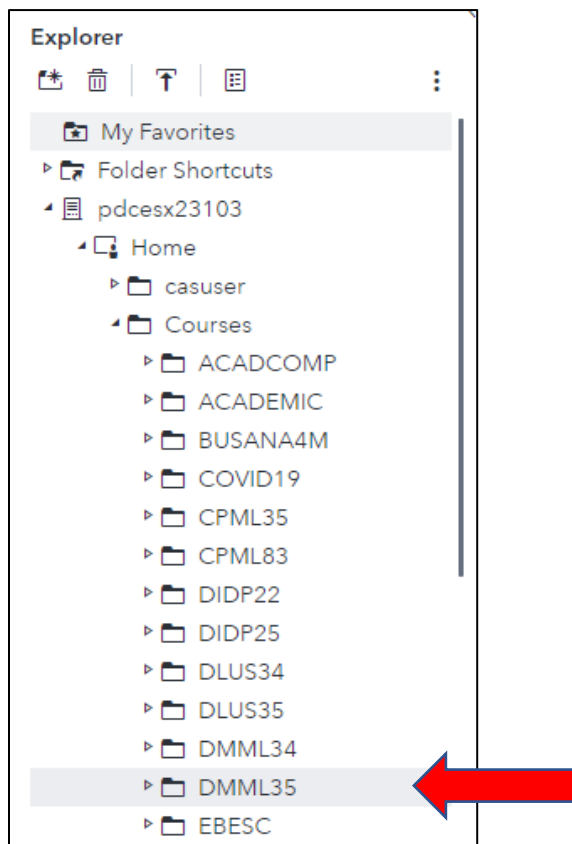
5. In the list of applications, select **Develop SAS Code**.



6. To access the SAS programs, click the **Explorer** icon on the left side of SAS Studio.

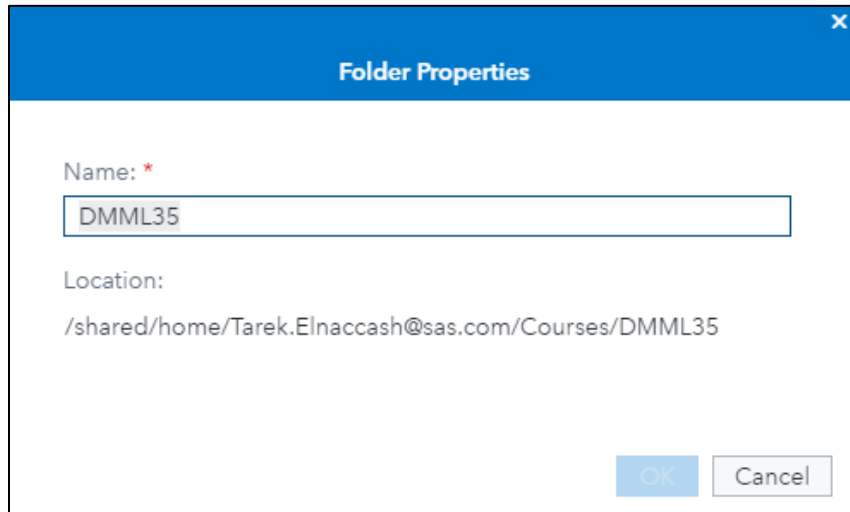


The SAS programs and data sets are located in the **Home** directory under **Courses** and **DMML35**.



Note that SAS Viya for Learners users **do not have Write privileges** for this directory.

7. Right-click the **DMML35** folder and select **Properties** to determine the path to the **DMML35** directory.



Note that this location will be used to create the libref **locallib** in the program **vfl_code_flow_lesson_1.sas**:

```
libname locallib '/shared/home/<your-user-id>/Courses/DMML35';
```

The user ID entered as part of the path to the course data is case sensitive. For example, entering the user ID above in lowercase returns an error:

```
1 %studio_hide_wrapper;
82 cas mySession sessopts=(caslib=casuser timeout=1800 locale="en_US");
NOTE: The session MYSESSION connected successfully to Cloud Analytic Services pdcesx23093.exnet.sas.com using port 5570. The UUID
is 051f3a30-1688-aa47-ac98-dbb1a4535512. The user is Tarek.Elnaccash@sas.com and the active caslib is
CASUSER(Tarek.Elnaccash@sas.com).
NOTE: The SAS option SESSREF was updated with the value MYSESSION.
NOTE: The SAS macro _SESSREF_ was updated with the value MYSESSION.
NOTE: The session is using 0 workers.
NOTE: 'CASUSER(Tarek.Elnaccash@sas.com)' is now the active caslib.
NOTE: The CAS statement request to update one or more session options for session MYSESSION completed.
83 libname locallib '/shared/home/tarek.elnaccash@sas.com/Courses/DMML35';
ERROR: The path /shared/home/tarek.elnaccash@sas.com/Courses/DMML35 is not in the list of accessible paths when SAS is in the
lockdown state.
ERROR: Error in the LIBNAME statement.
84
85 %studio_hide_wrapper;
96
97
```

Using the correct case for the user ID does not return an error:

```
1 %studio_hide_wrapper;
82 libname locallib '/shared/home/Tarek.Elnaccash@sas.com/Courses/DMML35';
NOTE: Libref LOCALLIB was successfully assigned as follows:
Engine: V9
Physical Name: /shared/home/Tarek.Elnaccash@sas.com/Courses/DMML35
83
84 %studio_hide_wrapper;
95
```

You can see the correct capitalization of the user ID in the properties of the DMML35 folder.

8. The program **vfl_code_flow_lesson_1.sas** corresponds to **code_flow_lesson_1.sas** in the course notes. This program differs from the course notes with a different directory in the LIBNAME statement, the creation of a macro variable that defines the home directory to which score code will be written, the modification of the CODE statement, and the modification of the %INCLUDE statement. The other programs are **vfl_code_flow_lesson_2.sas** through **vfl_code_flow_lesson_8.sas**.
9. The solutions to the practices are shown in **vfl_lesson_practice_0.sas** through **vfl_lesson_practice_8.sas**. These programs also differ from the course notes.
10. Be aware that the code generated by SAS Studio tasks typically writes FILENAME and CODE statements using single quotation marks. In several programs in this course, a macro variable is created using the following code to reference a location for writing programs:

```
%let homedir=%sysget (HOME);
```

Macro variables do not resolve if written within single quotation marks (for example, '&homedir'). Instead, any single quotation marks need to be changed to double quotation marks for the macro variable to resolve. For example:

```
code file= '&homedir/logselect_score.sas';  
/* &homedir does not resolve */
```

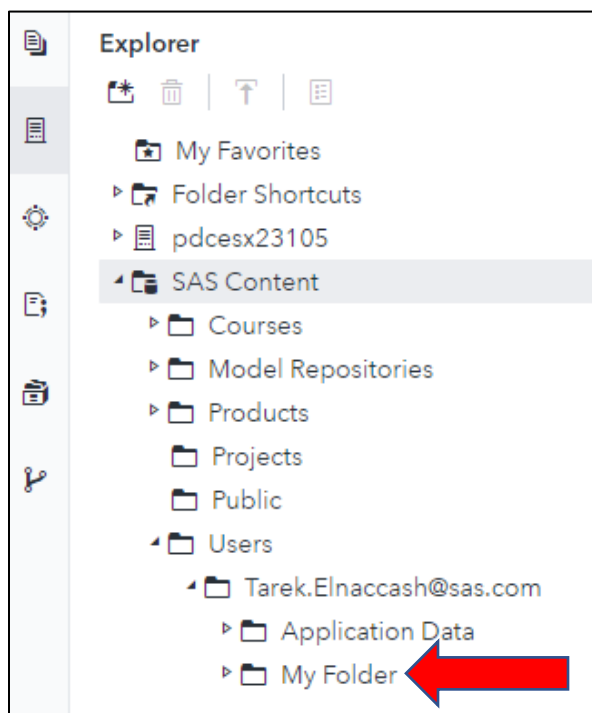
```
code file= "&homedir/logselect_score.sas";  
/* &homedir resolves correctly */
```

To view the location that **&homedir** resolves to, the following code writes the home directory to the SAS log:

```
%put &homedir;
```

11. In the course notes, the SAS Studio tasks that generate scoring code (for example, the Logistic Regression task in Lesson 2) reference the **DMML35** location, which is not writable in Viya for Learners. Executing the code in the PDF results in an error message. Instead, have the task write the incorrect location and then use the **Edit** button to change the path. An example of the edited path location can be seen in step 10 above.

12. Viya for Learners users cannot write to the **DMML35** folder. In order to save programs written during class, a writable folder must be used. The writable folder **Users/<User ID>/My Folder** can be found under SAS Content:



Right-clicking **My Folder** and selecting **Properties** reveals that this folder can be referenced as **Users/<User ID>/My Folder**, omitting the **SAS Content** parent directory name.

13. This course covers a lot of material. Consider Lessons 1 through Lesson 6 to be the content to cover in the two 7-hour class days. Lesson 7 (**Bayesian Networks**) and Lesson 8 (**Factorization Machines**) can be considered self-study lessons that can be covered in class if time permits.