Linear Statistical Modeling Methods with SAS

Introduction to SAS Viya

Xuemao Zhang
East Stroudsburg University

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Outline

- Overview of Viya
- Introduction to SAS Viya
- SAS Viya for Learners

What is SAS Viya?

- SAS Viya is a modern, cloud-enabled, in-memory analytics platform that provides quick, accurate and reliable analytical insights.
  - Designed to address the complexities of analytics in today's data-driven world.

SAS® Viya™

What is SAS Viya?

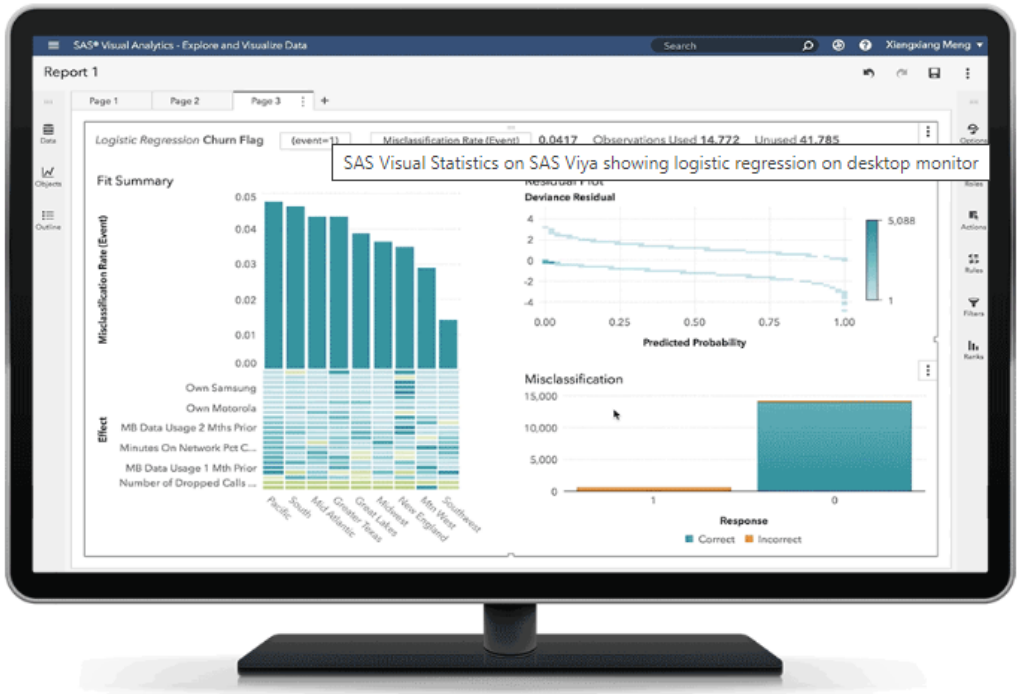
- SAS Viya is an underlying foundation for additional products that will take advantage of a cloud-enabled platform. Most offerings include both a coding interface as well a visual interface.
  - SAS Visual Analytics
  - SAS Visual Statistics
  - SAS Visual Data Mining and Machine Learning
  - SAS Visual Forecasting
  - SAS Visual Text Mining
  - SAS Optimization
  - SAS Econometrics

CAS (Cloud Analytics Services)

- CAS (Cloud Analytic Services) is a key component of SAS Viya.
  - CAS is designed to provide a distributed computing environment for performing advanced analytics and data processing tasks.
  - It facilitates parallel and distributed computing, allowing users to analyze large datasets efficiently.
- CAS (Cloud Analytic Services) can interact with R and Python through the use of language interfaces and connectors provided by SAS Viya.

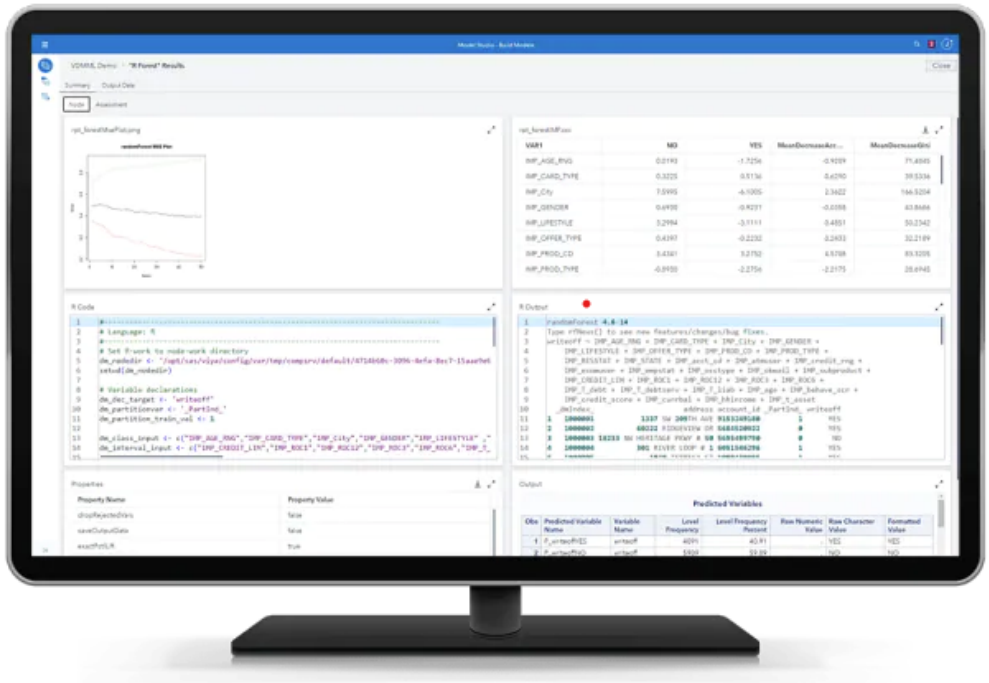
SAS Visual Statistics

- SAS Studio is a browser-based programming and code-generation interface.
  - It's available via a browser on any device that connects to your SAS environment.
- SAS Viya platform also provide SAS Studio.
- We have been using SAS Studio for more than 10 weeks in this course
  - SAS Visual Statistics:



SAS Visual Data Mining and Machine Learning

- SAS Visual Data Mining and Machine Learning (SAS VDMML) is a component of the SAS Viya platform that provides a comprehensive set of tools and capabilities for data mining, machine learning, and predictive analytics.
- It is designed to empower data scientists, statisticians, and analysts to build, validate, and deploy predictive models on large datasets, taking advantage of distributed and parallel processing.



SAS Viya for Learners

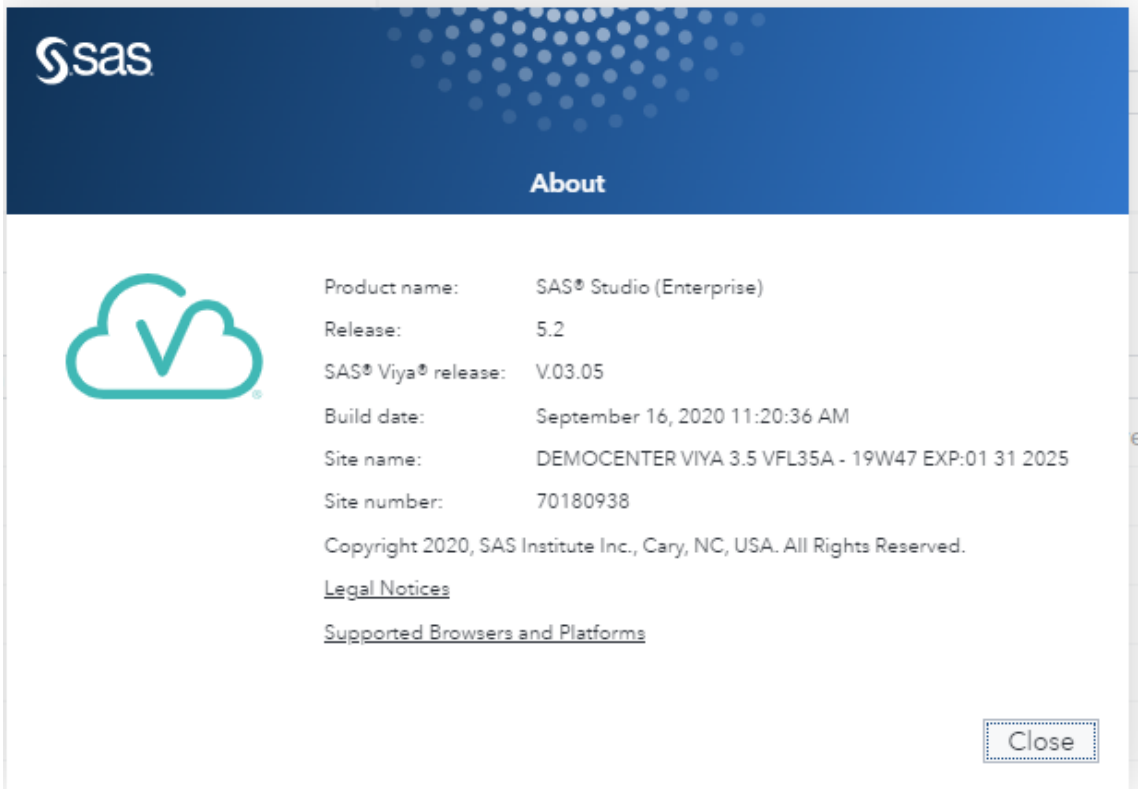
- SAS Viya for Learners is a free, educational offering from SAS Institute designed to provide students andprofessorswith access to SAS Viya.
- Advantages
  - **Free advanced analytics software from SAS**. Program in your language of choice – SAS, Python, R. Easily create visualizations to explain your work.
    - ⋆ **Marketable skills**. Explore data, discover insights and deploy models within a single, free software offering. And show off your skills with badges and certification opportunities.
    - ⋆ **Real-world practice**. Work with true business use cases using the same SAS software used by 92 of the top 100 companies on the Fortune Global 500.
    - ⋆ **Free help when you need it**. Access easy-to-digest learning materials – from basic programming through advanced deep learning, artificial intelligence and machine learning.

SAS Viya for Learners

- Watch the introduction video:
  https://www.sas.com/en_us/software/viya-for-learners.html

- Use your SAS profile to access SAS Viya for Learners 3.5
  https://vle.sas.com/course/view.php?name=SVFLVL
- After you lunch `SAS Viya for Learners`, we will be directed to `SASDrive`.
  - For example, the address of my SASDrive is
    https://v4e035.vfe.sas.com/SASDrive/

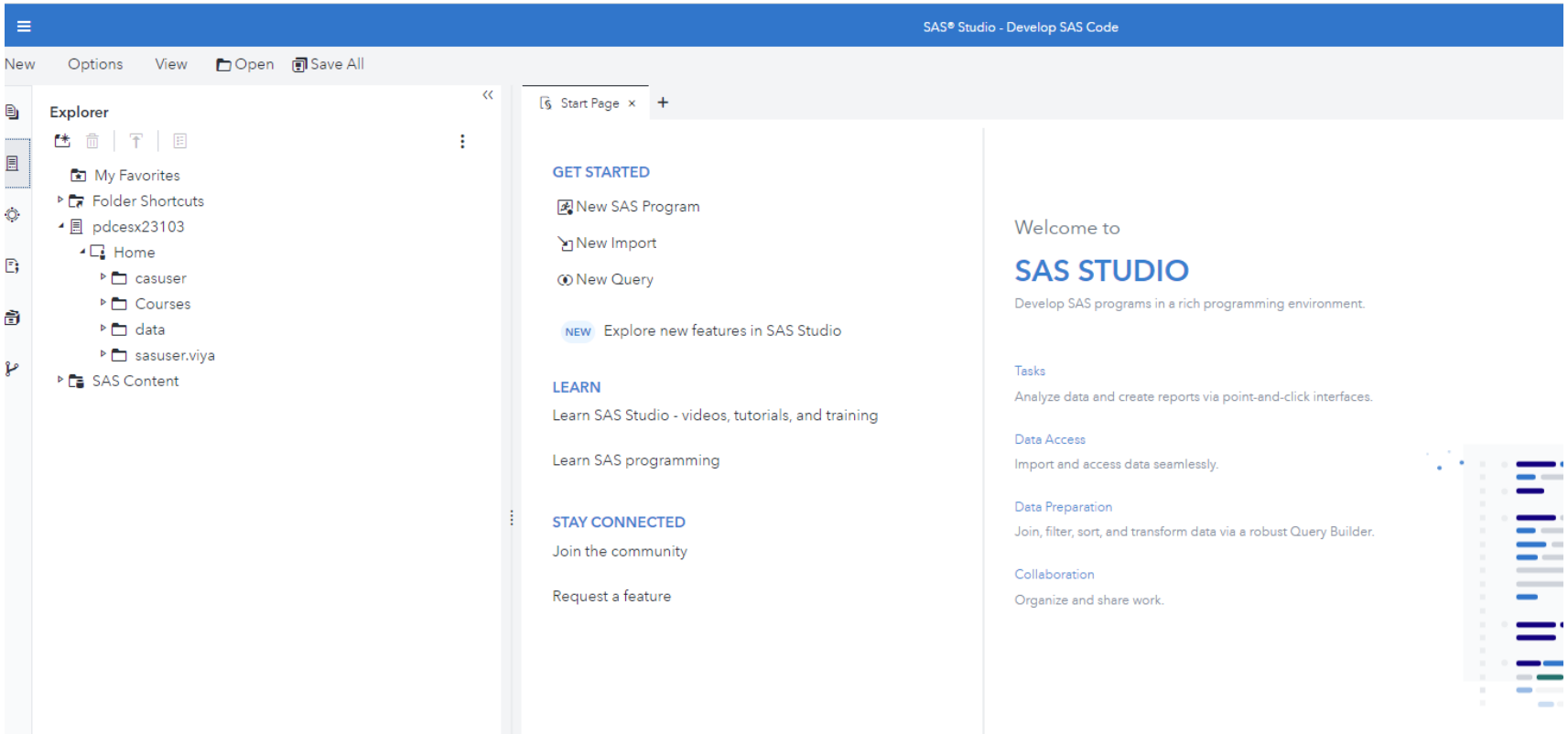
SAS Studio in Viya



- To access `SAS Studio`, click `Develop SAS Code` from the upper-left dropdown menu.

SAS Studio in Viya

- SAS Studio home page



SAS Studio in Viya

- To learn `CAS (Cloud Analytics Services)` programming language, you can select a course from `Courses` under `Home`.
- Within the `Exploer` of SAS Studio, click `Home` and then we can upload our own data to the folder **casuser**. **Do not create a sub-folder!!!**
  - Let's upload the data `Auto.csv` in the last lecture file.
  - For more information, read User Data Upload Info https://vfe.sas.com/lti/docs/KB%20article_VFL%20Individual%20Data%20Upload.pdf
- You may create a folder `code` to store our sas code files if you want to use SAS Studio in Viya a lot.

SAS Studio in Viya

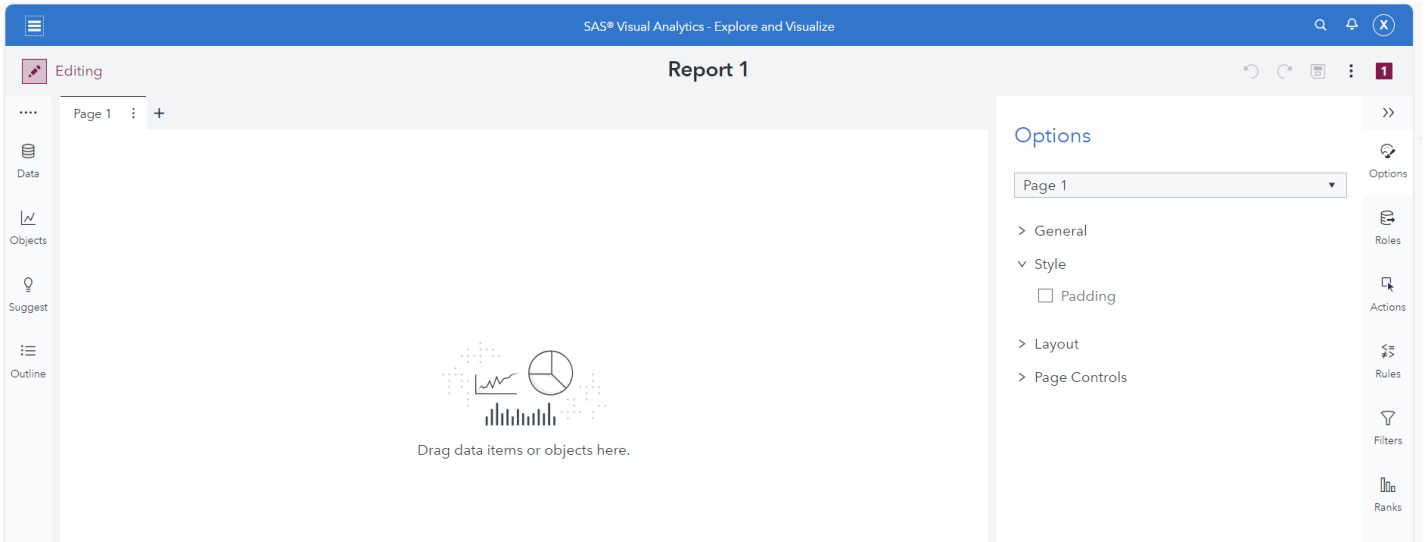
- click `New Import` or right-click the data and choose `Import data` to import the Auto data.
  - Do not run the code file `Import.ctl`. Save the file as a `.sas` file and run the code.
- The code should be run successfully, and we can check the data in the `Output Data` window
- Add the code to generate frequency table of the variables `cylinders` and `origin`.

```
proc freq data=WORK.IMPORT nlevels;
tables cylinders origin/nocum;
run;
```

- We can do everything we did in `SAS OnDemand for Academics`.

SAS Visual Analytics

- Let's check `SAS Visual Analytics`
  - Click `Share and Collaborate` from the upper-left dropdown menu, we can go back to the `SASDrive`.
  - And then choose `Explore and Visualize` from the dropdown menu.
  - Click `New Report` or `Start with Data`
- The following is the screen shot after clicking `New Report`



SAS Visual Analytics

Left Panel (to the left of `Report 1`)

- Data
  - We can manage and explore our dataset.
- Objects
  - We find the various visualization objects or components that we can add to your report. Examples include charts, graphs, tables, and other visual elements.
- Suggest
  - It offers suggestions or recommendations based on our data and analysis needs. It could provide automated insights or propose relevant visualizations based on the dataset.
- Outline
  - It provides an overview or structure of your report. It might show the hierarchy of different components in your report, making it easier to navigate and organize your visualizations.

SAS Visual Analytics

Options for the report

- General: general properties of our report.
- Style: We would find options for customizing the visual style of our report like background, border, line color ect. . .
- Layout: provides options for organizing and structuring the layout of your report. This could involve configuring the arrangement of visualizations, grids, and other elements on the report canvas.
- Page Controls: controls for managing the overall presentation of our report,

SAS Visual Analytics

Right panel

- Options: show/hide **Options**.
- Roles: defining roles (e.g., X-axis, Y-axis, color, size) for different objects in our report.
- Actions: allow you to define and configure interactive actions on objects in our report. Actions could include things like drill-downs, pop-ups, or other responses triggered by user interactions with specific objects.
- Rules: setting up rules or conditions that dictate the behavior or appearance of objects in your report.
- Filters: define filters that control the data displayed in our report. Filters help in narrowing down the data based on specified criteria, allowing you to focus on specific subsets of our dataset.
- Ranks: defining ranking criteria for data variables. This might involve specifying how data should be ranked or ordered within a visualization.

SAS Visual Analytics

- You can create a report from available data or user-uploaded data
- For example, to access the uploaded data `Auto`
  - click on the Data icon on the left bar
  - A dialogue box will open. Click **Data Sources**.
  - Click on the drop-down arrow on the cas server like `cas-v4e035-default`
  - Click on the drop-down arrow on **CASUSER**.

SAS Visual Analytics

- SAS Visual Analytics is a powerful tool for data visualization and business intelligence
  - Other popular BI tools include Power BI and Tableau
- It can provide insights for more advanced analytics and statistical modeling
- Our focus in this course is data modelling. You can try to use SAS Visual Analytics to visualize the Auto data.

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