



Week 5

## Artificial Intelligence Program Infrastructure and Architecture

Assignments [60%]

EXAMS [40%]

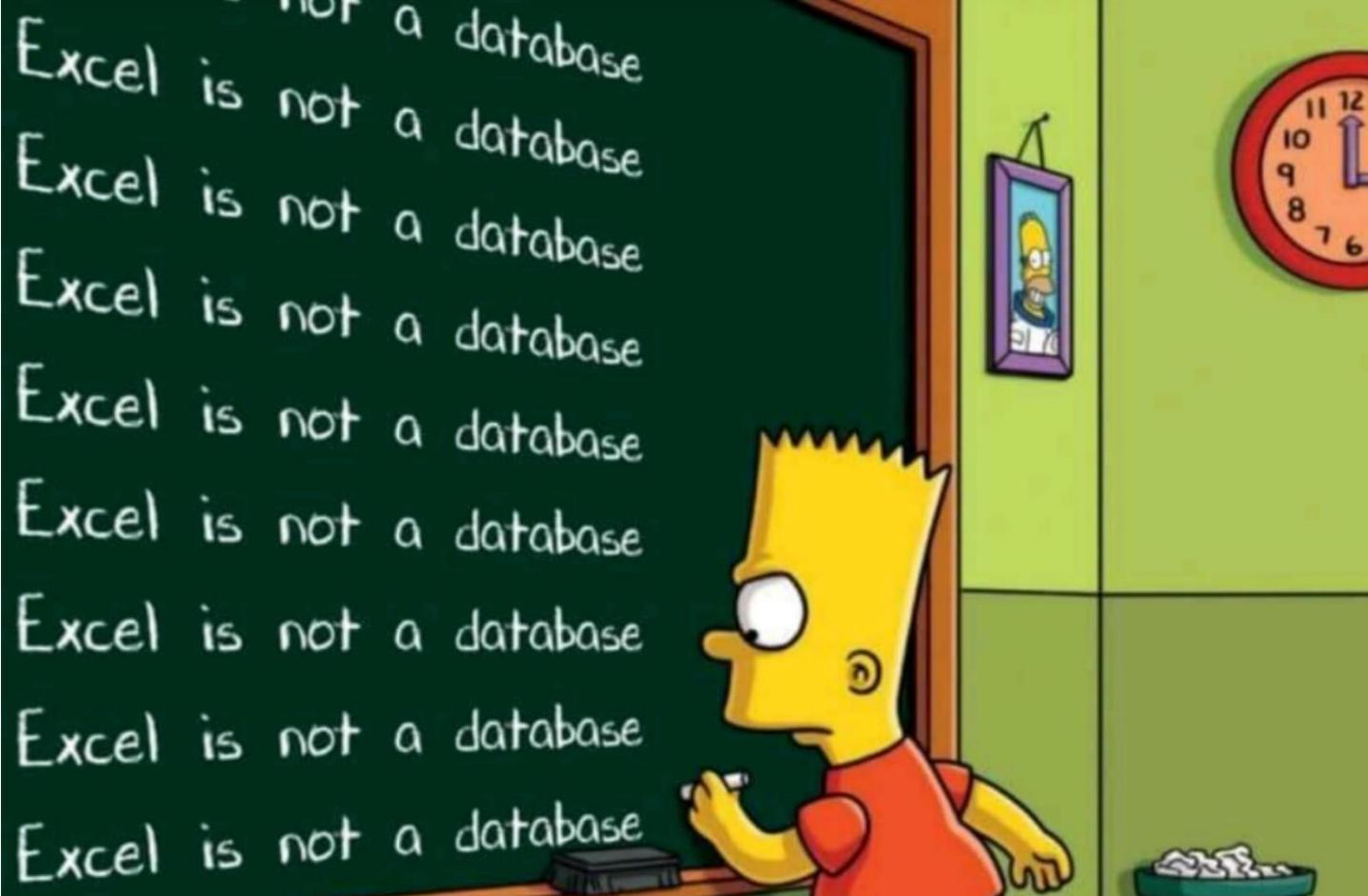
# > Agenda // Program

WEEK	SUBJECT	ASSIGNMENT / TO BE DELIVERED	DATES
2	Intro / AI Function / Enablers		Sep 13
3	Infra and Architecture / On-prem vs. Cloud / CSPs	C1	Sep 20
4	Data Pipeline / Processes / Framework / AutoML	#1 Image Classifier [5%]	Sep 27
5	Data Pipeline / Processes / Framework / AutoML	C2	Oct 4
6	More Data / SSIS / ADF / Data Quality	#2 Machine Learning Studio [10%]	Oct 11
7	Azure services – Intro	EXAM 1 [20%] C3	Oct 18
8	READING WEEK	NO CLASSES	Oct 25
9	Azure services – Cognitive Services 1	41	Nov 1
10	Azure services – Cognitive Services 2	#3 Draw your own Architecture (in class) [5%] 42	Nov 8
11	Azure services – Cognitive Services 3	43	Nov 15
12	Azure services – Cognitive Services 4	#4 Azure pipeline // Sentiment Analysis [20%] 44	Nov 22
13	AWS Academy – Cloud Foundations 		Nov 29
14	AWS Academy – Machine Learning 	#5 AWS Academy – Cloud Foundations [10%]	Dec 6
15	Enterprise Architecture	EXAM 2 [20%] #6 AWS Academy – Machine Learning [10%]	Dec 13

# > Agenda

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- SSMS – Management Studio
- SSIS – Integration Services
- SSRS – Reporting Services
- ADS – Azure Data Studio
- ADF – Azure Data Factory
- Data Quality
- Data Lineage
- Data Catalog
- Enterprise Data Management
- Assignment #2 – Azure Machine Learning Studio



# Big Data Infra: Cloud Alternatives

[scgupta.link/big-data](http://scgupta.link/big-data)



- On-prem Hybrid
- Data Factory
- Lake Store
- Synapse



**databricks**

- Multi Cloud
- Delta Lake
- Schema-on-Read
- ML Workloads

aws

- Single Cloud
- RedShift
- S3
- EMR



**Google Cloud**

- Single Cloud
- BigQuery
- Cloud Storage
- DataProc
- BigQuery Omni



**snowflake**

- Multi Cloud
- Columnar Store
- Relational Schema
- BI Workloads

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**SSMS**

**Management Studio**



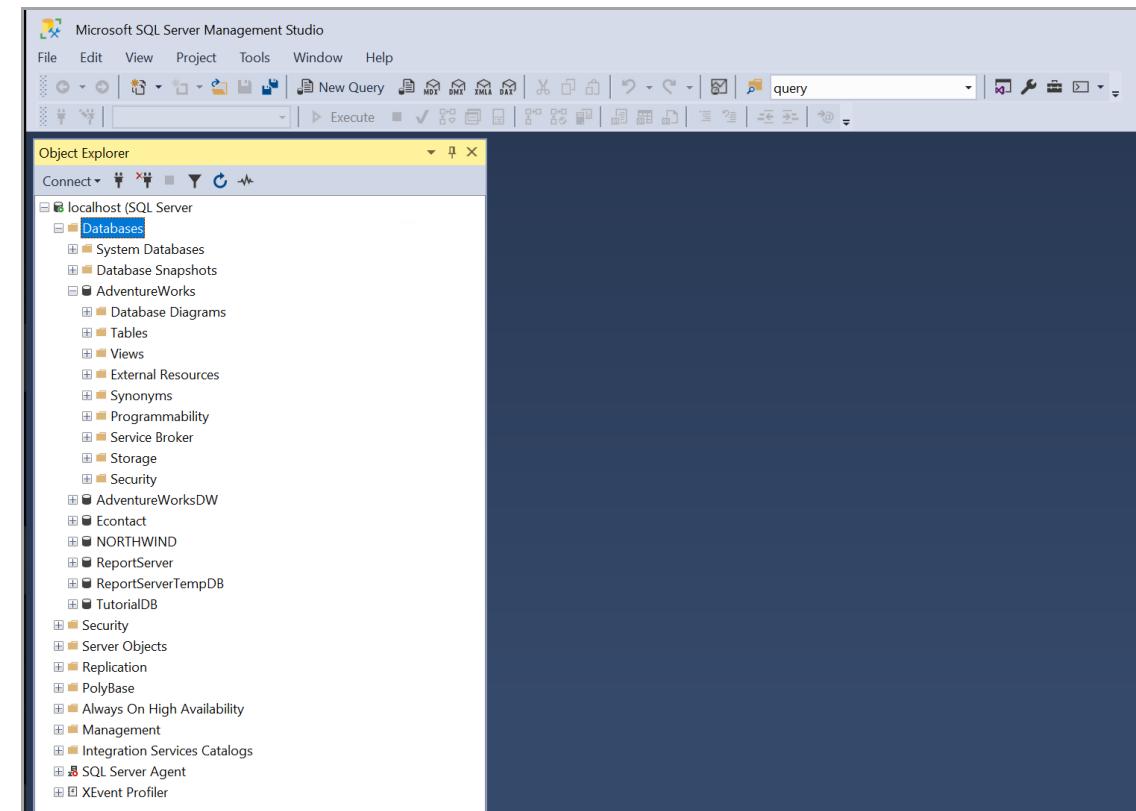
# > SSMS

## SQL Server Management Studio

SQL Server Management Studio (SSMS) is the most popular tool for SQL Server in the world.

SSMS is integrated to visualize and work with Azure SQL, including SQL Server in virtual machines, SQL managed instances, and SQL databases.

When necessary, SSMS shows only options that work for a specific Azure service.

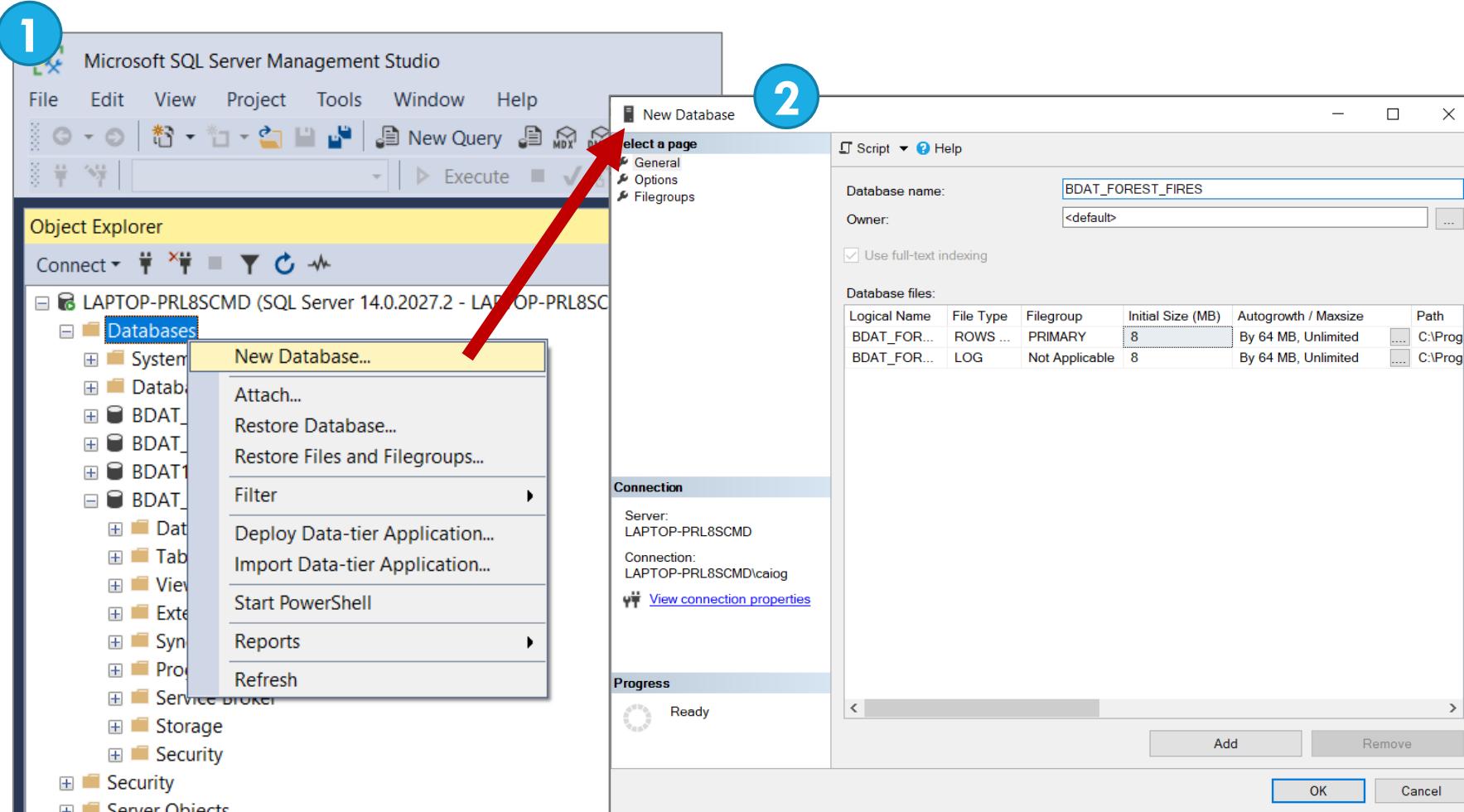


SSIS

Integration Services



# > SSIS | CREATE DATABASE



## CREATE DATABASE

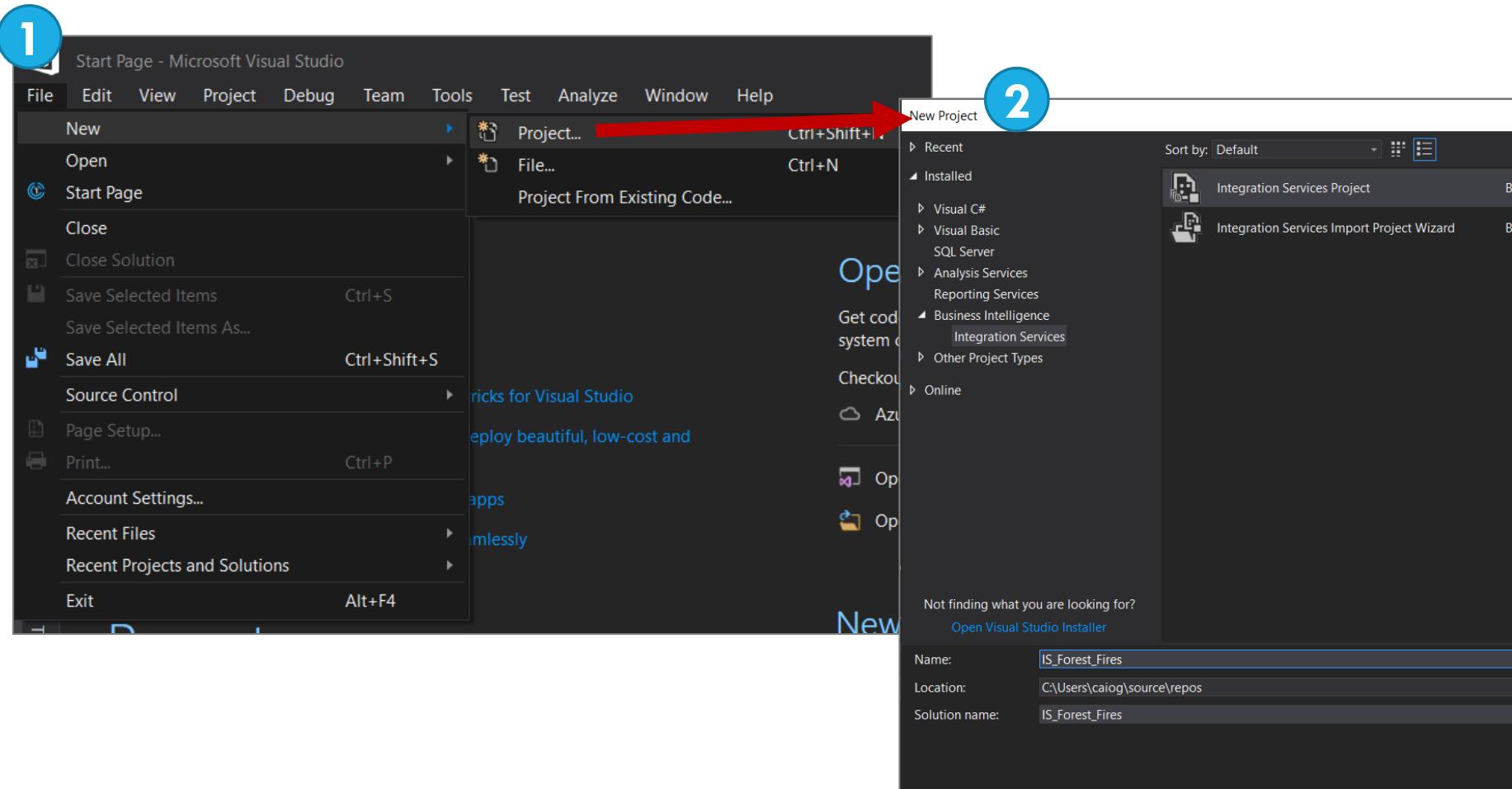
### SCREEN 1

- Open **SSMS - SQL Server Management Studio**
- Right click on **Databases**
- Select **New Database...**

### SCREEN 2

- In the **database name**, type the name to identify your new database

# > SSIS | IMPORT DATA



## VISUAL STUDIO

### SCREEN 1

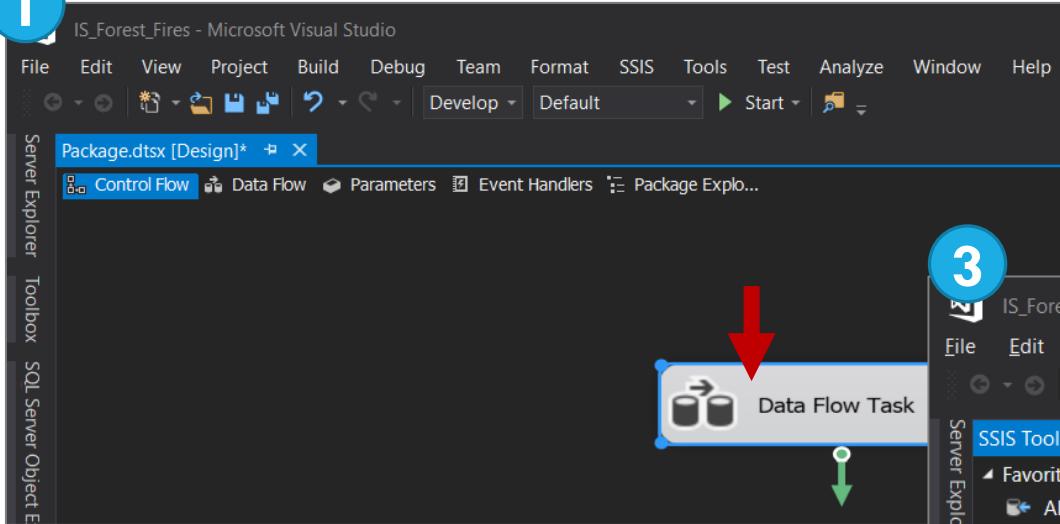
- Open **Visual Studio**
- Select **File > New > Project**

### SCREEN 2

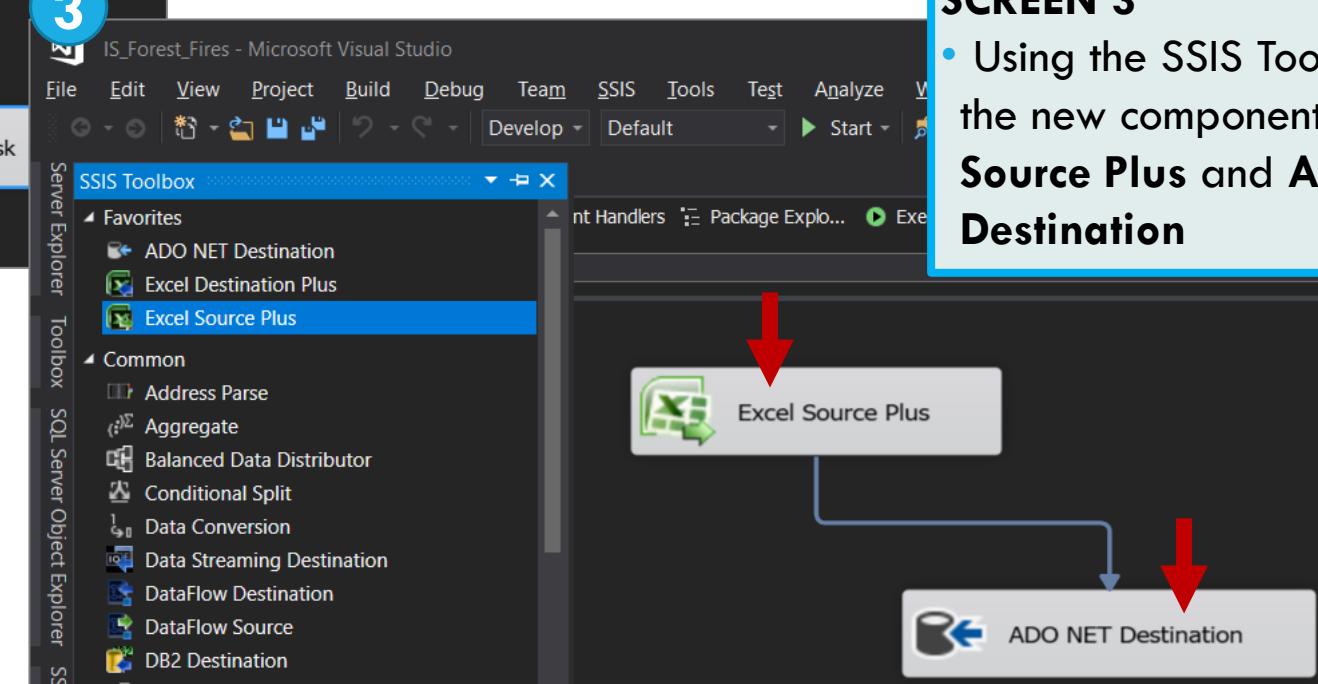
- Select **Integration Services Project...**
- Type the **name** for your Integration Services Project

# > SSIS | IMPORT DATA | DATA FLOW

1



3



## VISUAL STUDIO

### SCREEN 1

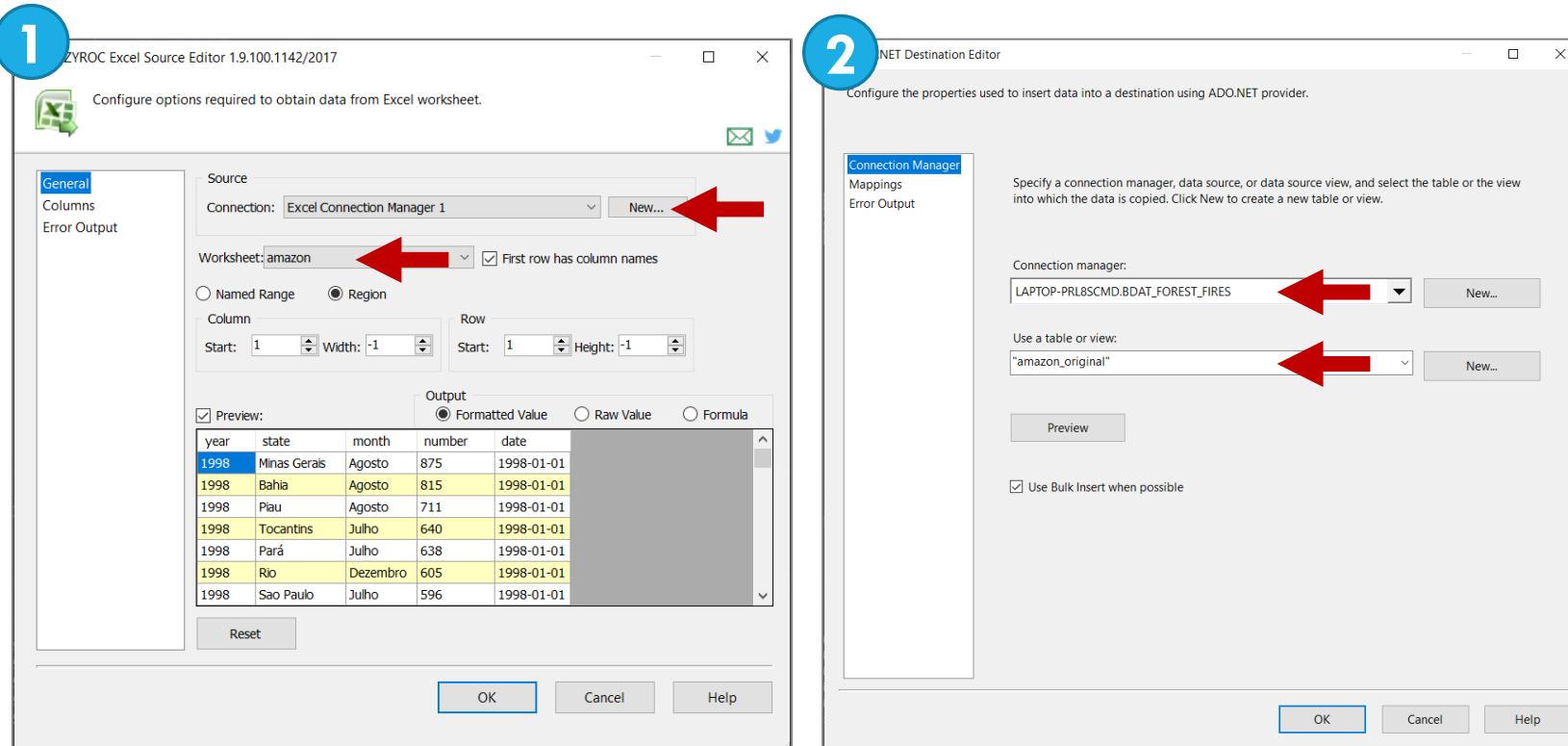
- Create a new Data Flow Task, using the SSIS Toolbox (detail - screen 2)
- Double click in the Data Flow Task and you will get the screen 3

### SCREEN 3

- Using the SSIS Toolbox create the new components **Excel Source Plus** and **ADO NET Destination**

Server Explorer Toolbox SQL Server Object Explorer

# > SSIS | IMPORT DATA | DATA FLOW



## VISUAL STUDIO

### SCREEN 1

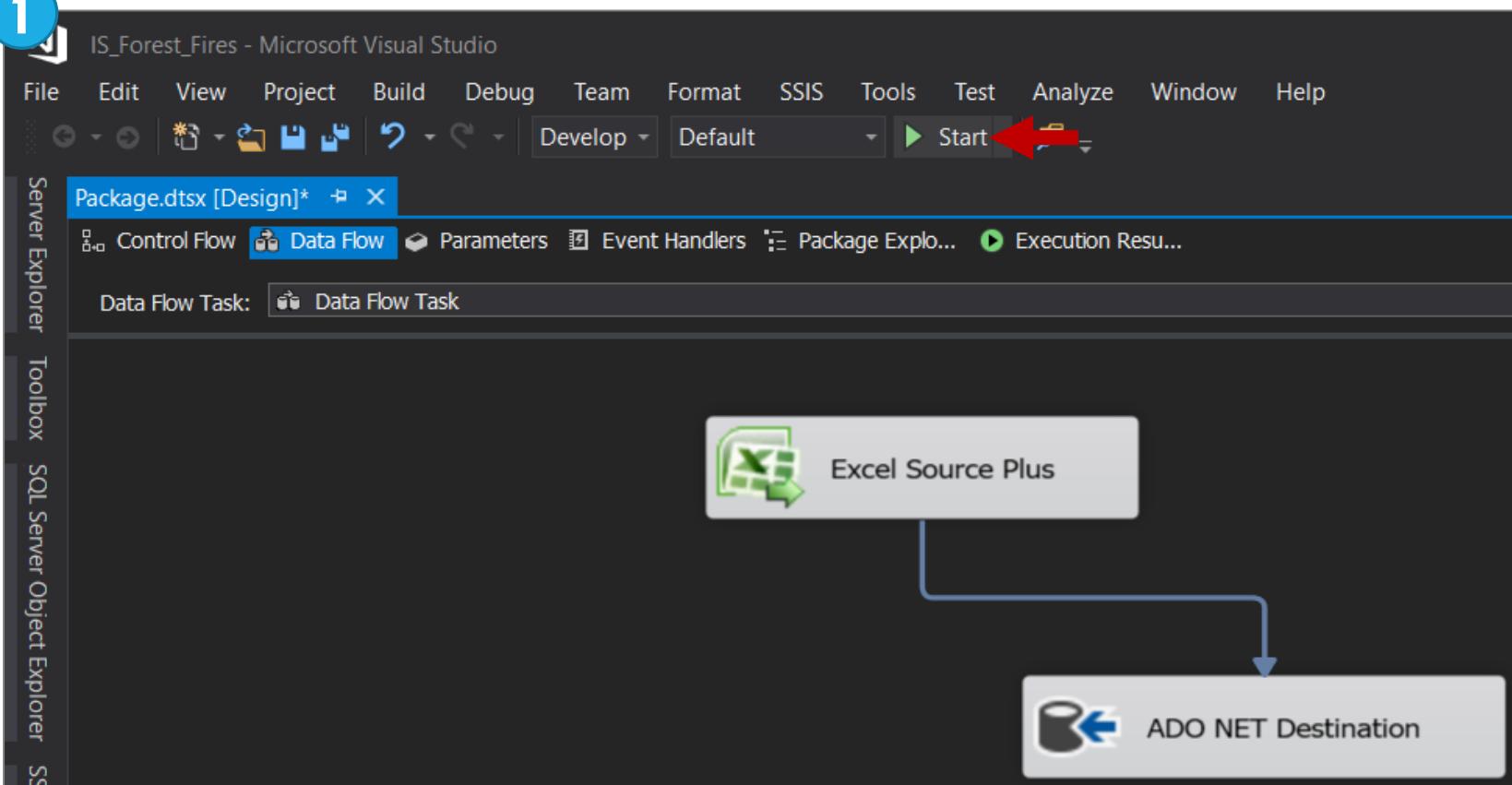
- Double click in the **Excel Source Plus** icon
- Click in the bottom **New** and select the **source file**
- In **Worksheet** select the **worksheet name**

### SCREEN 2

- Double click in the **ADO.NET Destination** icon
- Click in the bottom **New** and select the **database name**
- Click in the bottom **New** and type the **name of the destination table**

# > SSIS | IMPORT DATA | DATA FLOW

1



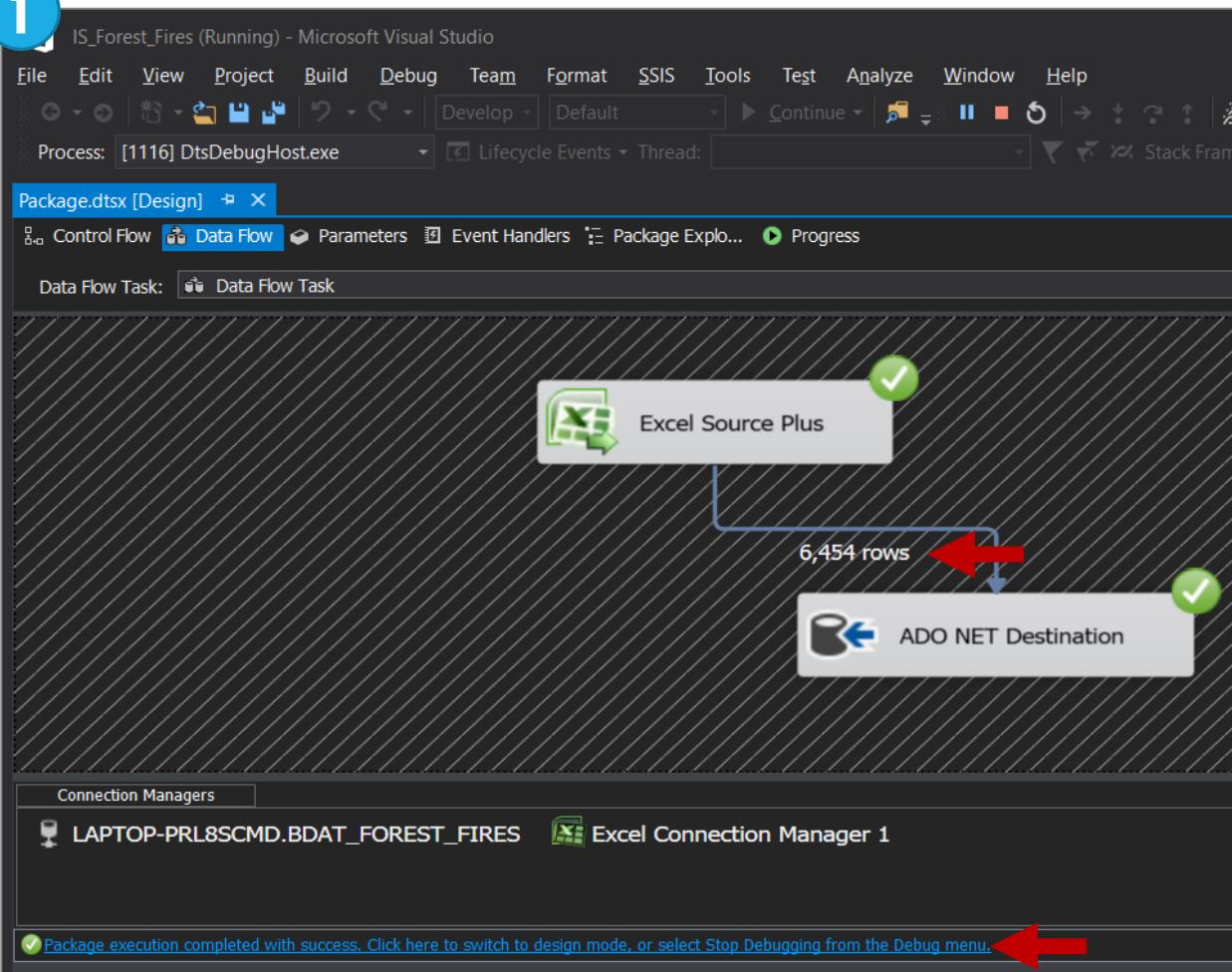
## VISUAL STUDIO

### SCREEN 1

- After perform all the steps, click in the **Start** bottom to Visual Studio starts you flow.

# > SSIS | IMPORT DATA | DATA FLOW

1



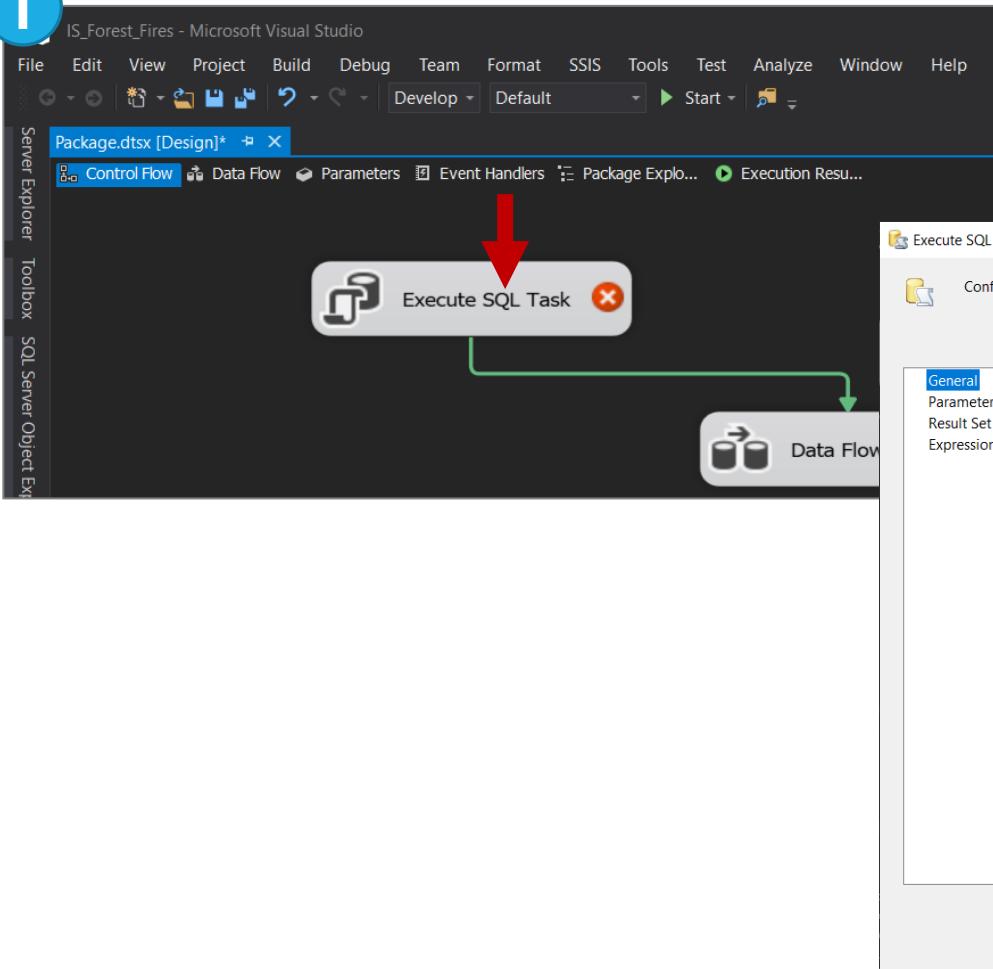
## VISUAL STUDIO

### SCREEN 1

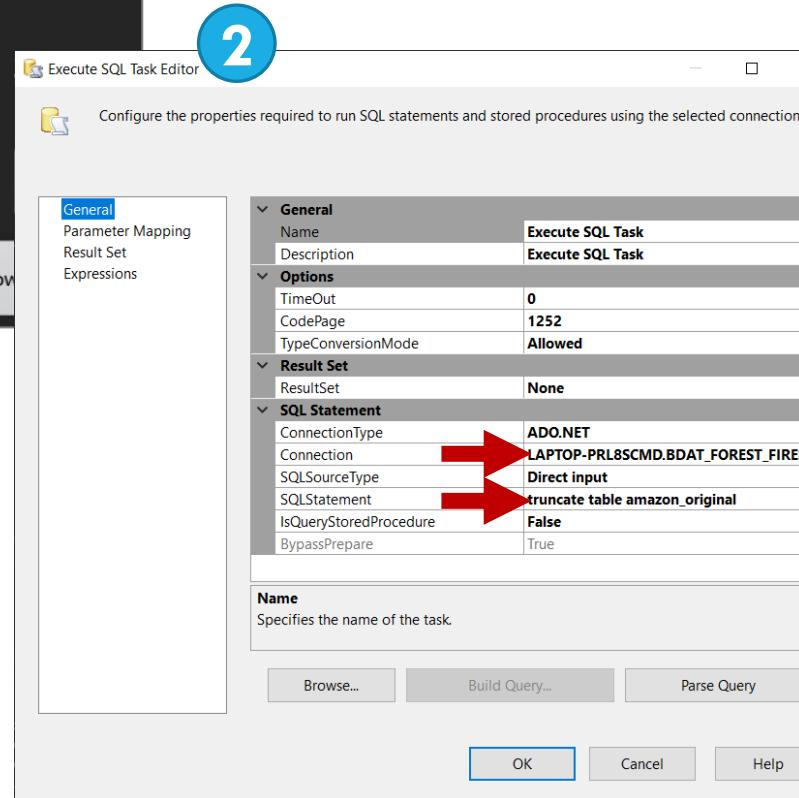
- Check the result of the integration
- In the example you can see that 6,454 rows were imported from the **source** (Excel Source Plus) to the **SQL Server** (ADO NET Destination)

# > SSIS | KEEP DATA UPDATED | TRUNCATE

1



2



## VISUAL STUDIO

### SCREEN 1

- Using the SSIS Toolbox add the component **Execute SQL Task**
- Double click in the **Execute SQL Task** icon

### SCREEN 2

- Select the connection type **ADO.NET** and the **database name**
- In the SQL statement write – **truncate table <table name>**
- This statement will perform table clearing and the next step will import the data from the original file in a clear table.

# > SSIS | SELECT TOP 1,000 ROWS

1

The screenshot shows the Microsoft SQL Server Management Studio (SSMS) interface. In the Object Explorer, under the database 'BDAT\_FOREST\_FIRES', the table 'dbo.amazon\_original' is selected. A context menu is open over this table, with the 'Select Top 1000 Rows' option highlighted by a red arrow. The main query window displays a SQL script:

```
***** Script for SelectTopNRows command from SSMS *****
SELECT TOP (1000) [year]
      ,[state]
      ,[month]
      ,[number]
      ,[date]
  FROM [BDAT_FOREST_FIRES].[dbo].[amazon_original]
```

A blue box labeled 'SQL statement' highlights the script. Below the script, the results pane shows a table with 6 rows of data:

	year	state	month	number	date
1	1998	Minas Ger...	Agosto	875	1998-01-01
2	1998	Bahia	Agosto	815	1998-01-01
3	1998	Piau	Agosto	711	1998-01-01
4	1998	Tocantins	Julho	640	1998-01-01
5	1998	Pará	Julho	638	1998-01-01
6	1998	Rio	Dezembro	605	1998-01-01

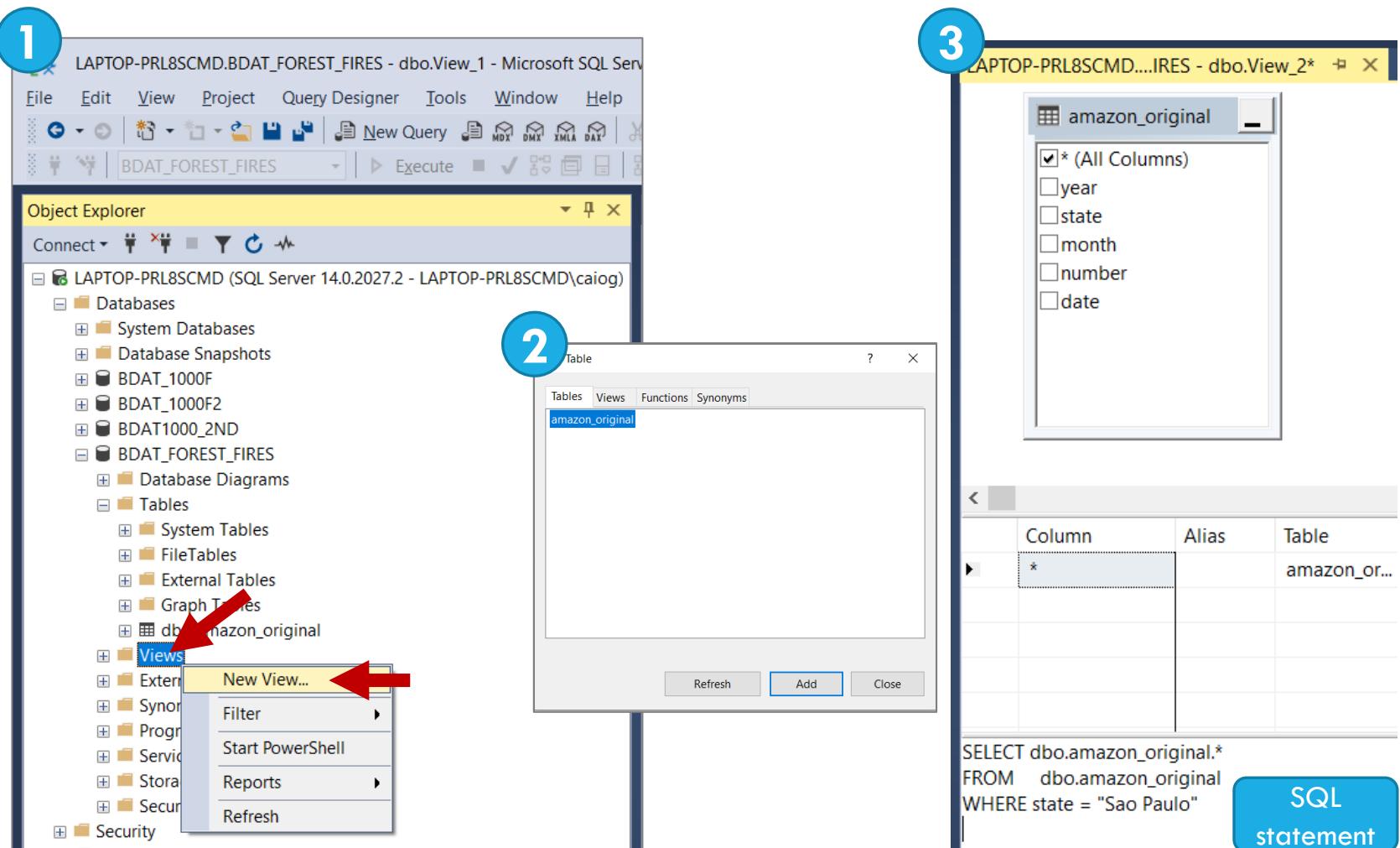
A blue box labeled 'Results' highlights the results pane.

## SSMS

### SCREEN 1

- Open the **SSMS – SQL Management Studio**
- Select the **database**
- Select the **table**
- Right click in the **table name**
- Select the option **Select Top 1000 Rows**
- Automatically the SSMS will create the **SQL statement** to perform the selected command.

# > SSIS | CREATE A VIEW



**SSMS**

## SCREEN 1

- Select the **Database**
- Select the **Views**
- Right click in the **Views**
- Select the option **New View...**

## SCREEN 2

- Select the **table name**

## SCREEN 3

- Select the **fields**
- You can complete the **SQL statement** generated in the bottom of the screen
- Choose a name and save the view.

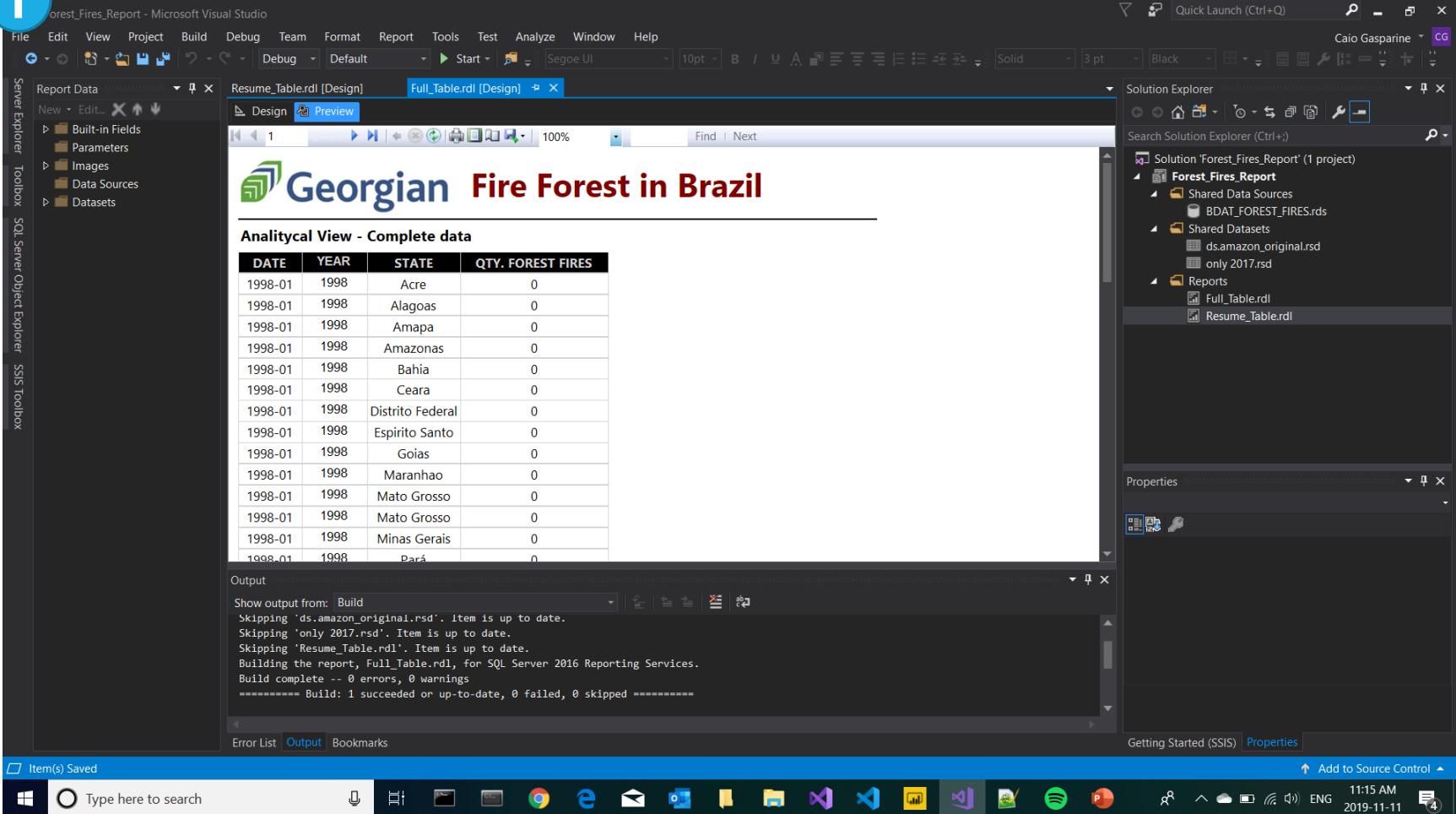
**SSRS**

**Reporting Services**



# > SSRS | TABLE REPORT

1

**SSRS**

## SCREEN 1

- Report created
- Full Table (Analytical View)
- All the lines of the report,  
ordered by year and month.

# > SSRS | TABLE REPORT

2

Forest\_Fires\_Report - Microsoft Visual Studio

Report Data

New Edit... X X

Resume\_Table.rdl [Design] X Full\_Table.rdl [Design]

Design Preview

Find Next

100% Find

Georgian Fire Forest in Brazil

Table - Resume (qty. of fires forest by state by year 1998-2017)

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Acre	0	0	0	0	0	10	0	12	4	0	0	0	1	0	0	0	0	1	12	
Alagoas	0	58	11	5	12	150	9	83	29	33	55	104	23	41	36	49	54	81	24	
Amapa	0	0	2	0	7	31	38	109	6	0	2	4	2	0	30	3	10	14	19	
Amazonas	0	3	7	3	17	158	123	44	20	37	16	9	82	53	6	37	46	35	770	
Bahia	0	114	31	24	125	439	158	303	225	373	314	177	297	101	179	125	132	256	285	
Ceara	0	47	1	11	33	264	143	384	211	304	166	347	288	32	273	103	115	207	100	
Distrito Federal	0	0	0	0	0	0	0	0	0	0	1	2	2	0	0	0	0	1	1	
Espirito Santo	0	33	5	1	2	4	1	4	13	0	12	4	52	3	1	10	11	76	43	
Goias	0	14	10	29	12	14	10	27	85	28	23	30	59	39	21	33	80	118	52	
Maranhao	0	54	19	29	48	436	241	450	221	428	121	240	319	124	326	209	195	494	412	
Mato Grosso	0	239	326	97	304	896	301	438	947	476	245	527	298	171	201	269	315	960	374	
Minas Gerais	0	36	24	18	29	37	22	28	109	91	85	74	118	61	75	75	133	147	61	

Output

```
Show output from: Build
Skipping 'ds.amazon_original.rsd'. Item is up to date.
Skipping 'only 2017.rsd'. Item is up to date.
Skipping 'Full_Table.rdl'. Item is up to date.
Building the report, Resume_Table.rdl, for SQL Server 2016 Reporting Services.
Build complete -- 0 errors, 0 warnings
----- Build: 1 succeeded or up-to-date, 0 failed, 0 skipped -----
```

Error List Output Bookmarks

Getting Started (SSIS) Properties

Add to Source Control

Ready

Type here to search

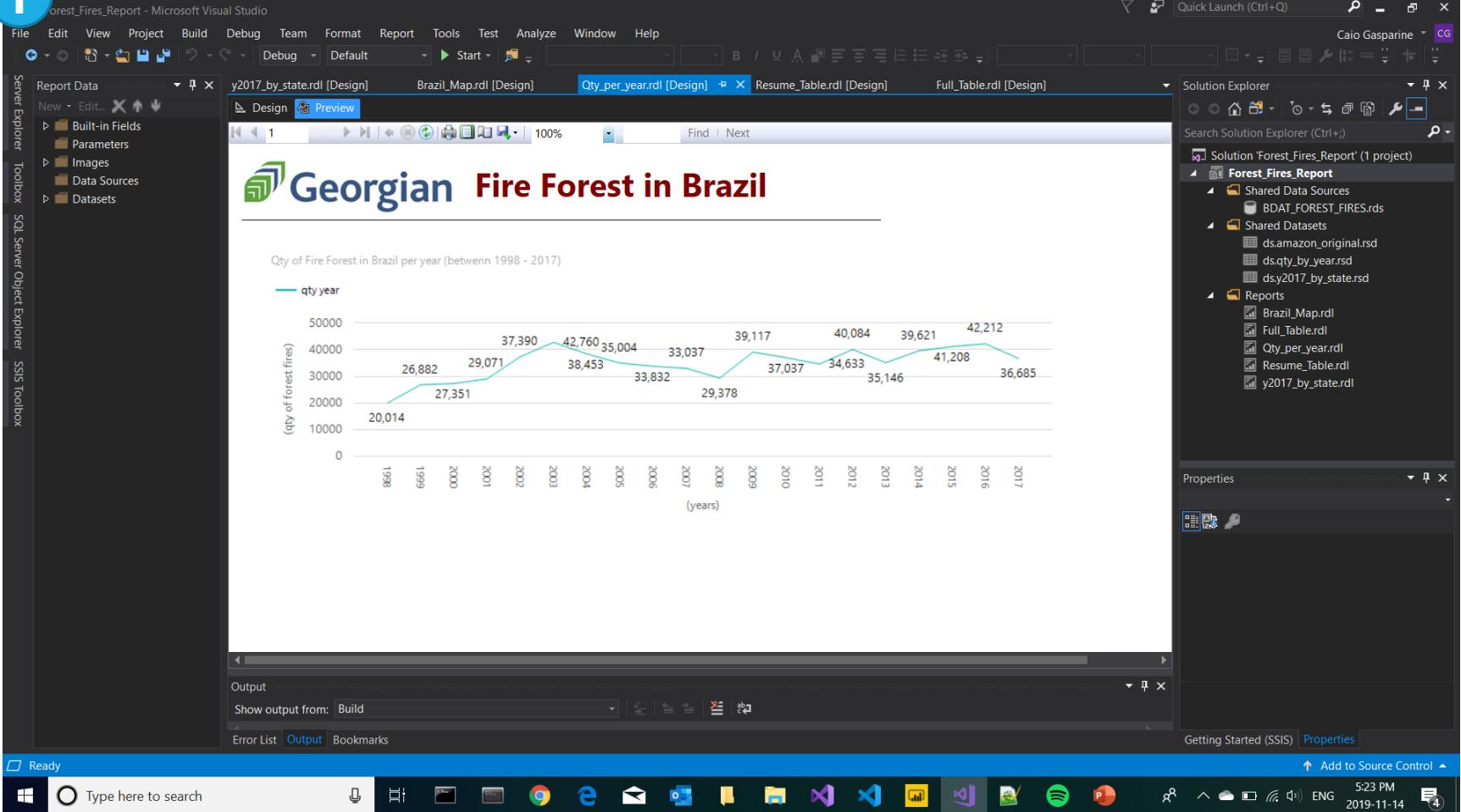
SSRS

## SCREEN 2

- Report created
- Resume Table (Matrix View)
- Consolidated view, grouped by State and Year with the sum of the reported number of Forest Fires.

# > SSRS | GRAPH REPORT

1



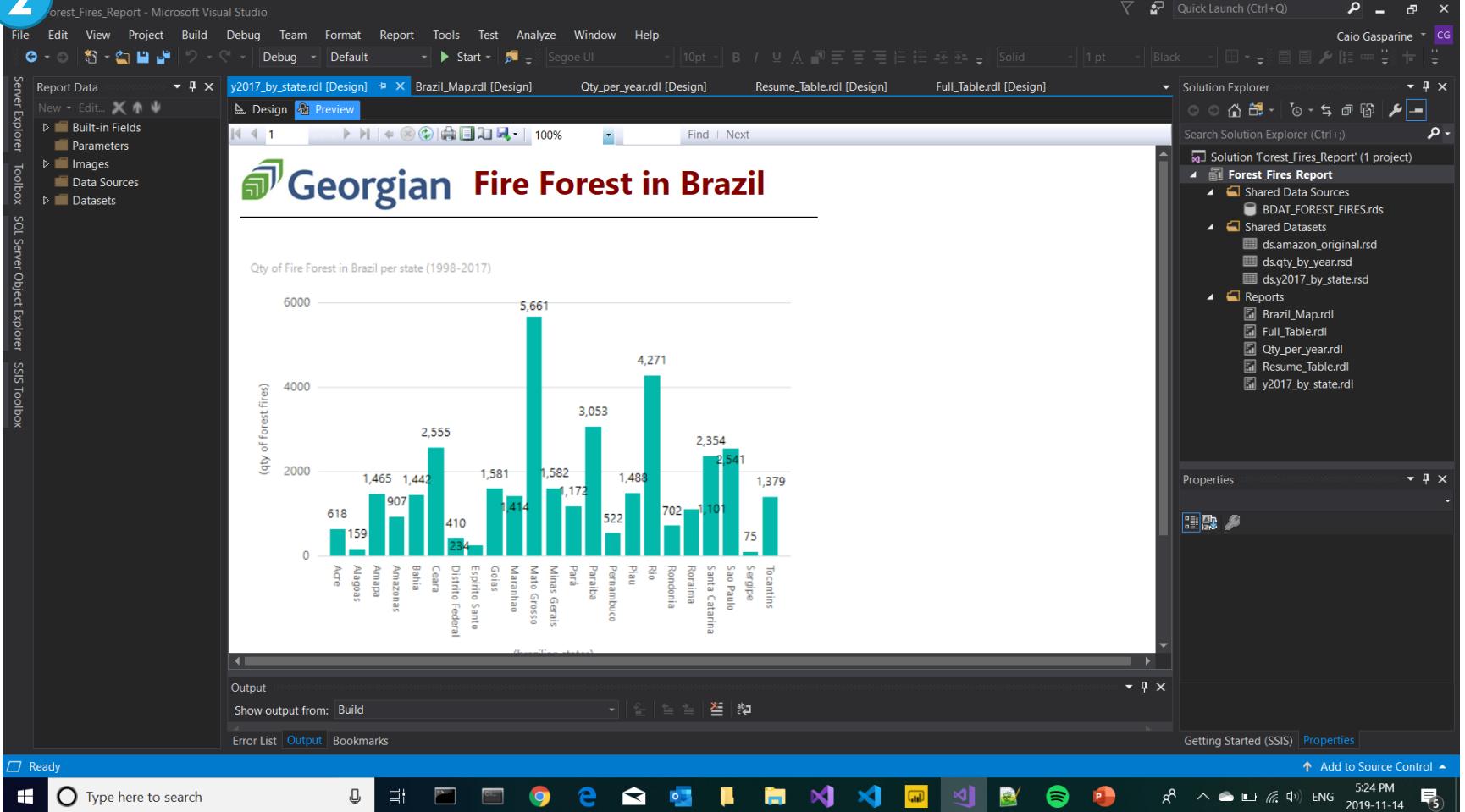
**S S R S**

## SCREEN 1

- Report created
- Bar Chart
- Consolidated view, grouped by Year, summarizing the total amount of reported Fire Forest per year.

# > SSRS | GRAPH REPORT

2



SSRS

## SCREEN 2

- Report created
- Bar Chart
- Consolidated view, grouped by State, summarizing the total amount of reported Fire Forest per state.

**ADS**

**Azure Data Studio**

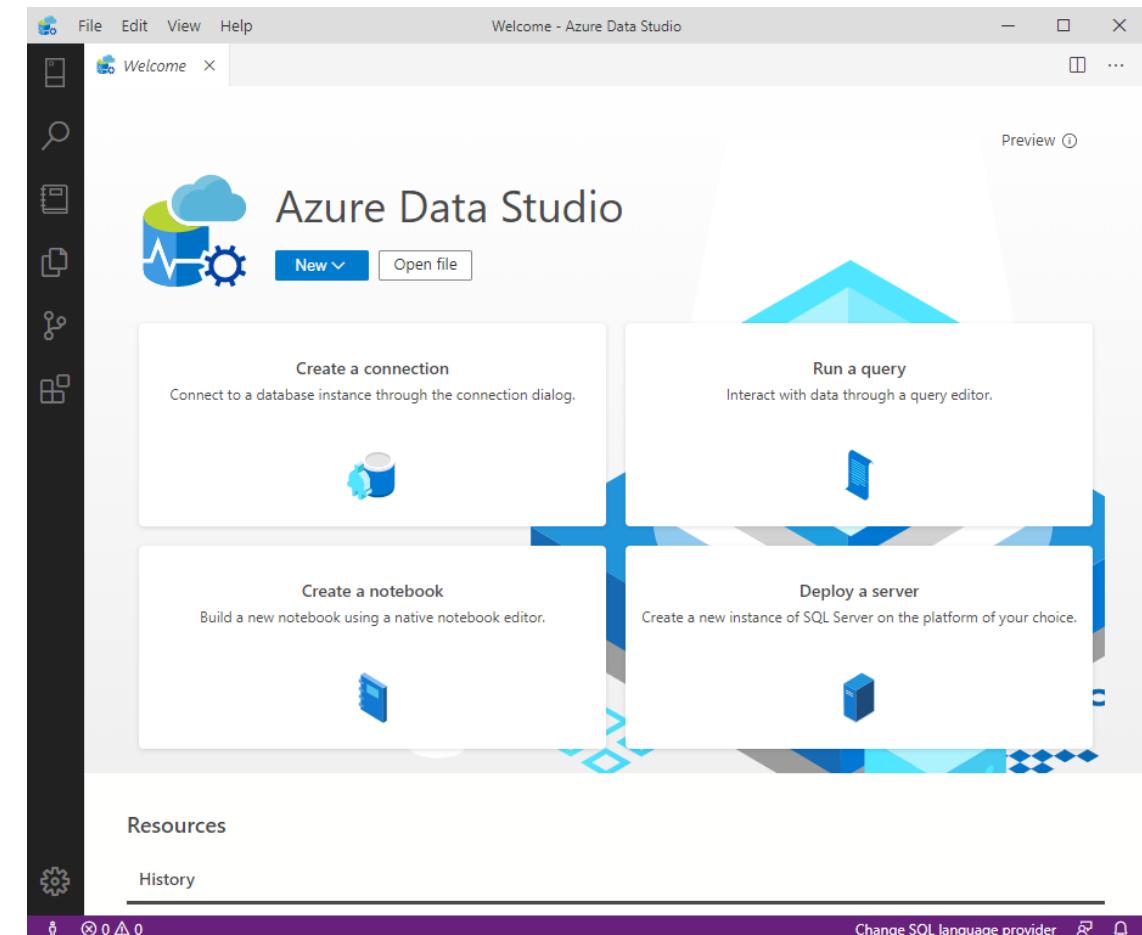


# > ADS

## Azure Data Studio

Azure Data Studio is an open-source, cross-platform tool for querying and working with various Azure data sources, including SQL Server and Azure SQL.

Azure Data Studio supports a powerful tool called notebooks. Notebooks allow you to mix runnable code cells and formatted text in one place. You can optionally save the results for future reference or analysis.



ADF

Azure Data Factory



# Azure Data Factory

Hybrid data integration service for enabling code-free ETL



Industry leading  
data ingestion



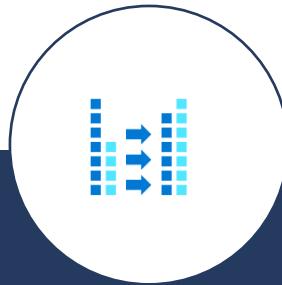
Visual  
No Code



Hybrid



Pay only for what  
you use

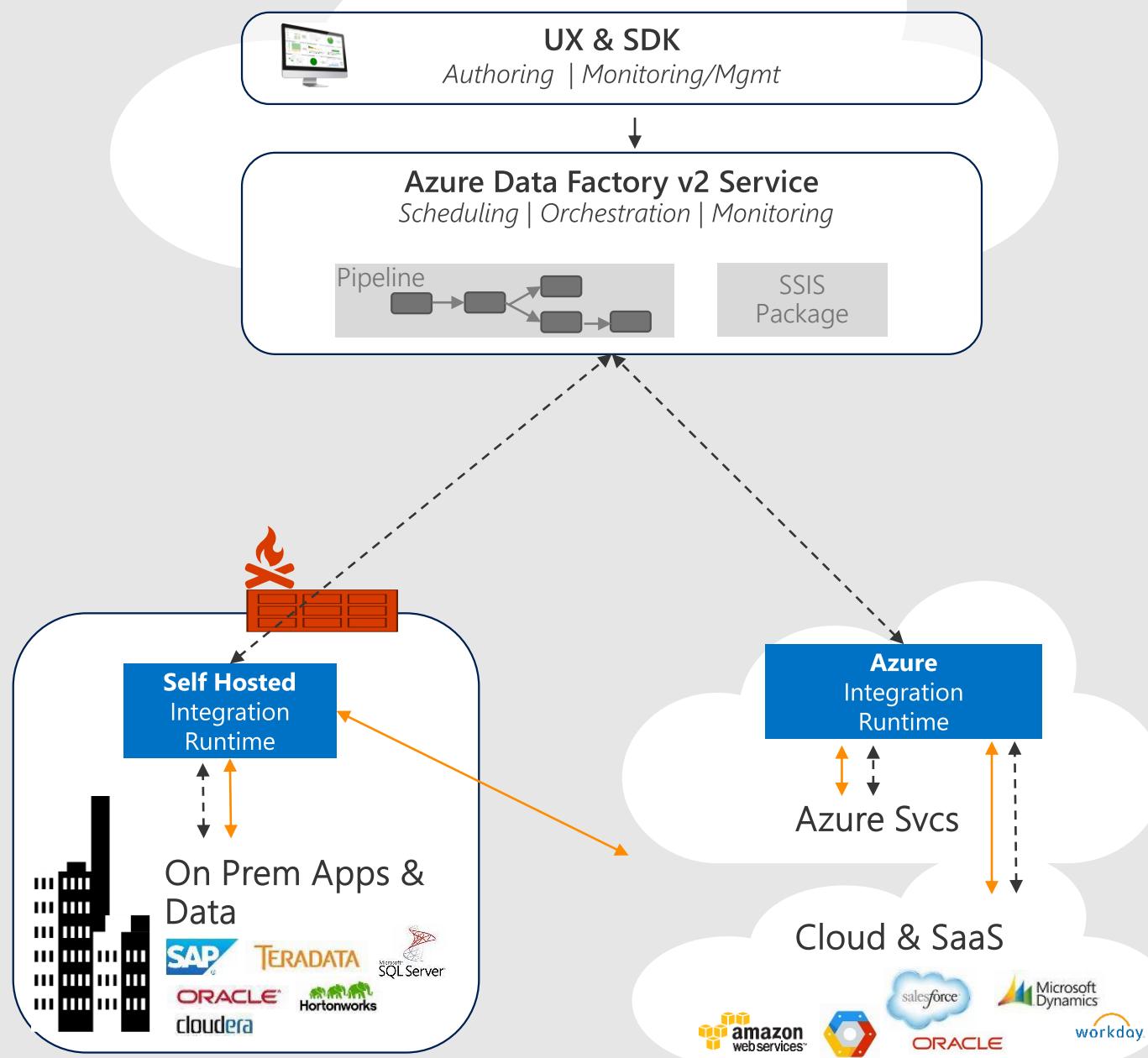


Managed SSIS

Productive & trusted hybrid data integration service  
that simplifies ETL with any data, from any source, at scale.

←→ Command and Control

←→ Data



## Data Factory

A data integration account.

Location of orchestration, service metadata

## Integration Runtime (IR)

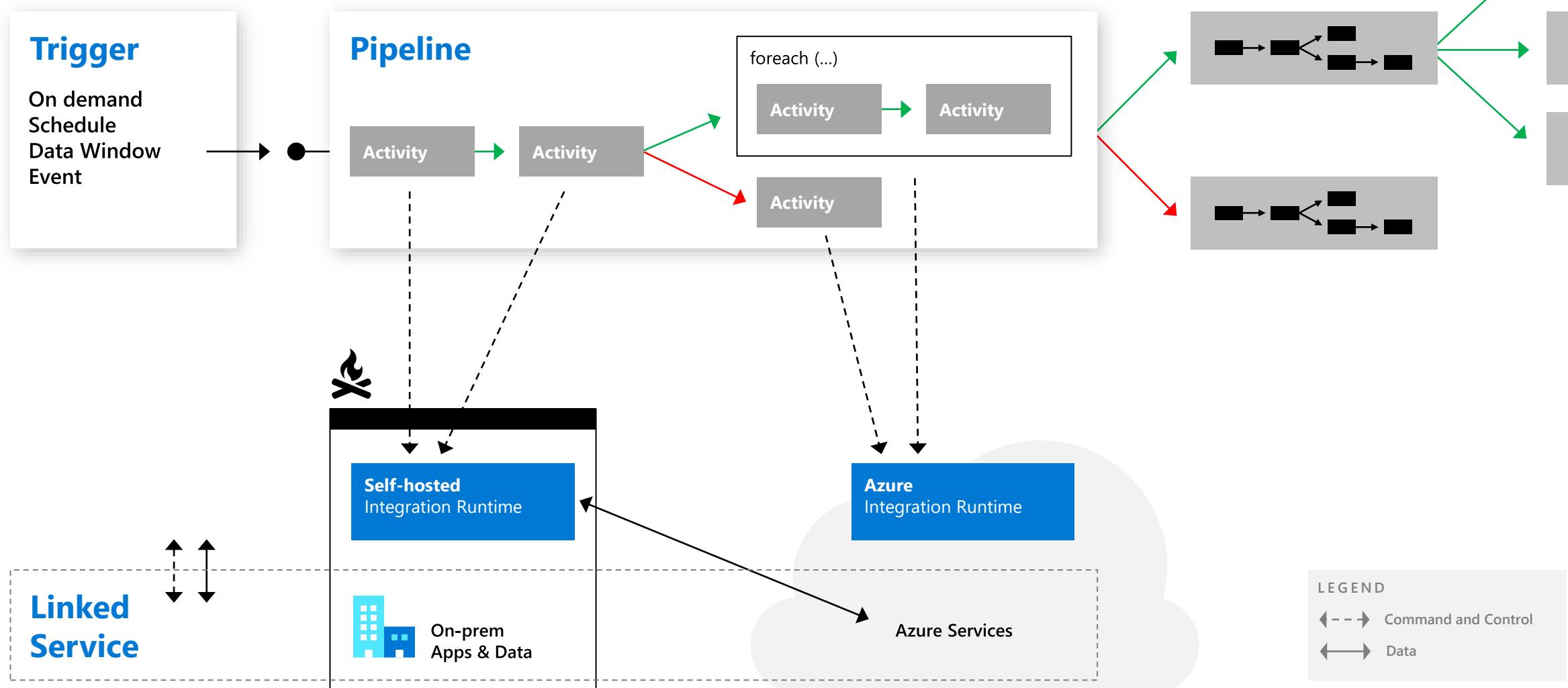
ADF's execution engine

- Azure Integration Runtime
- Self-Hosted Integration Runtime
- SSIS Integration Runtime

Three core capabilities:

- data movement
- pipeline activity execution
- SSIS package execution

# Orchestration @ Scale

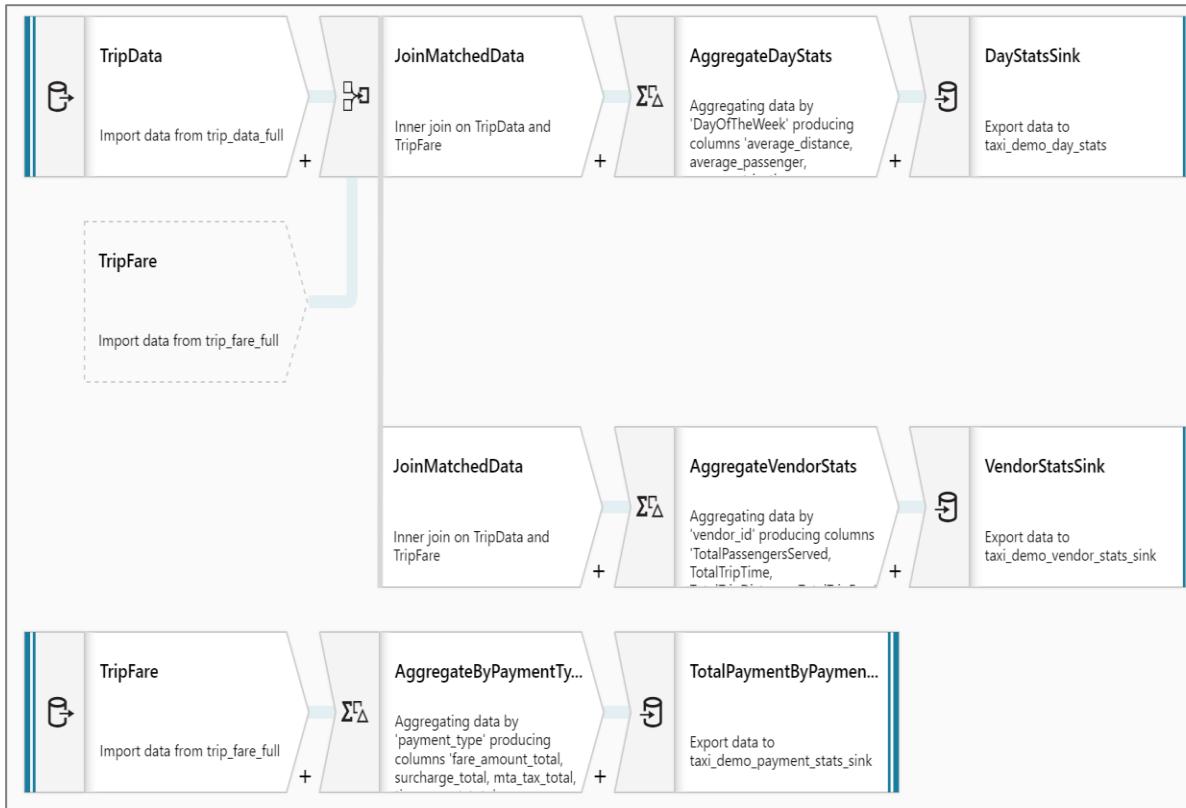


# Azure Data Factory Data Flows

No-code data transformation and preparation @ scale

## Mapping Dataflow

Code free data transformation @scale



## Wrangling Dataflow

Code free data preparation @scale

The screenshot shows the Microsoft Azure Data Factory Wrangling Dataflow interface. A table titled "Table.RemoveColumns(#'Renamed CustomerID', {"CustomerID"})" is displayed, showing data rows and columns. The "Applied steps" pane on the right lists the following steps:

- Source
- Removed columns
- Merged queries
- Renamed CustomerID
- Removed columns

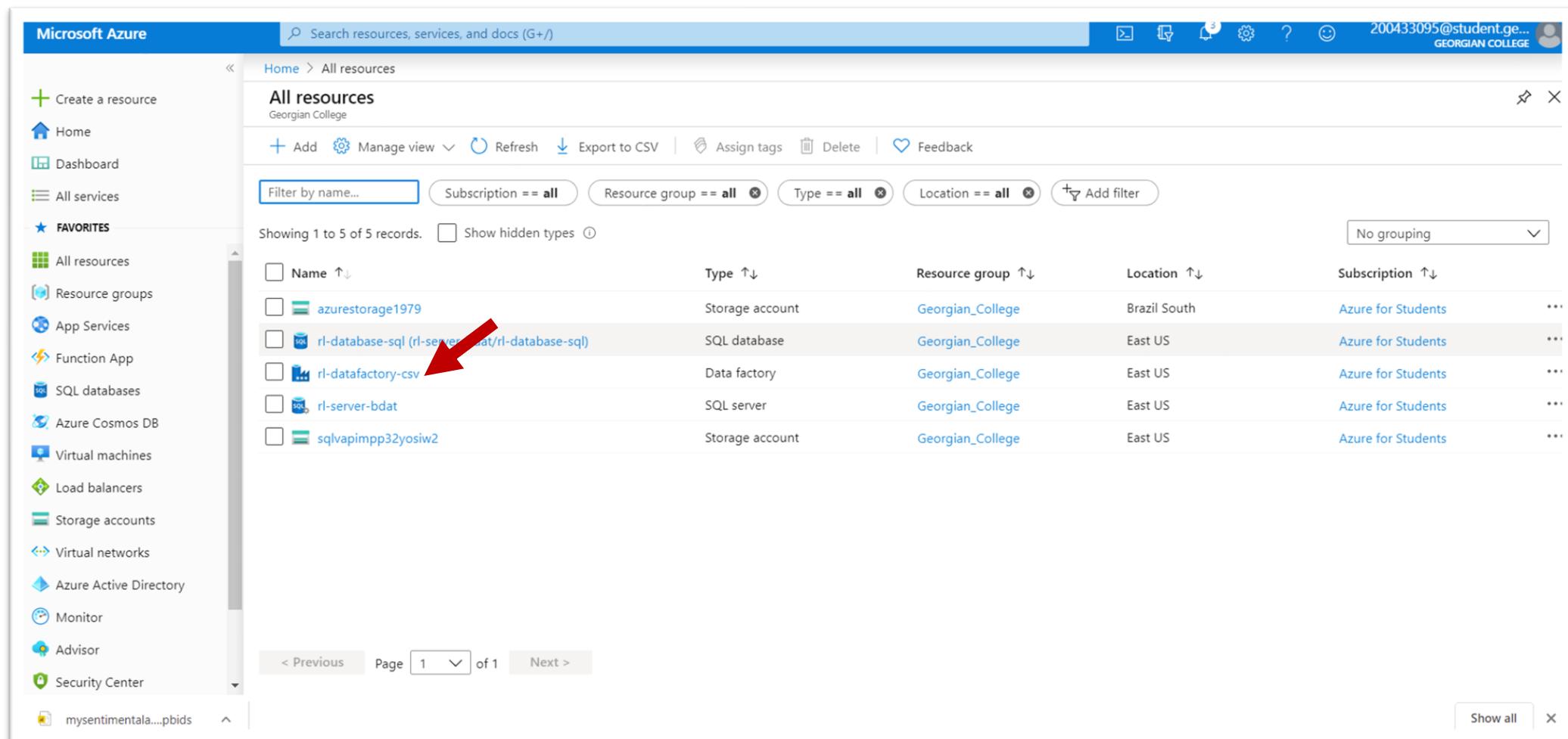
CustId	FirstName	LastName	City	ZIP	Email	State	BasePay
1	Harry	Potter	Bellevue	98004	harryk@fabrikam.com	WA	90000
2	Harry	Potter	Bellevue	98004	harryk@fabrikam.com	WA	90000
3	Hermione	Granger	Wilmington	19801	hermione@fabrikam.com	DE	100000
4	Hermione	Granger	Wilmington	19801	gamalfloy@fabrikam.com	DE	100000
5	Lord	Voldemort	Billingt	59115	lordc@fabrikam.com	MT	110000
6	Albus	Dumbledore	Newyork	12345	albusd@fabrikam.com	NY	120000
7	Severus	Snape	Columbus	56789	severus@fabrikam.com	OH	130000
8	Draco	Malfoy	Houston	91019	dracoh@fabrikam.com	TX	140000
9	Dobby	Elf	Salt Lake C...	11128	dobby@fabrikam.com	UT	150000
10	Ron	Weasley	Las Vegas	51527	ronag@fabrikam.com	NV	160000
11	Sirius	Black	Providence	61623	hblack@fabrikam.com	RI	170000
12	Luna	Lovegood	Kansas City	68692	lunal@fabrikam.com	MO	180000
13	Rubeus	Hagrid	Boston	98052	gamafoyl@fabrikam.com	Malfoy	190000
14	Bellatrix	Lestrange	Los Angeles	78965	mlestrange@fabrikam.com	CA	200000
15	Ginny	Weasley	Redmond	98052	ginnyw@fabrikam.com	WA	210000
16	Neville	Longbottom	Bothell	98053	nevilles@fabrikam.com	WA	220000
17	Alastor	Moody	Renton	98054	albusd@fabrikam.com	WA	230000
18	Lucius	Malfoy	Seattle	98004	luciusmalfoy@fabrikam.co...	WA	240000
19	Cedric	Diggory	Seattle	98989	cedricp@fabrikam.com	WA	250000
20	Argus	Filch	Salt Lake C...	11128	argusm@fabrikam.com	UT	260000
21	Lord	Voldemort	Billingt	59115	lordc@fabrikam.com	MT	110000
22	Albus	Dumbledore	Newyork	12345	albusd@fabrikam.com	NY	120000
23	Severus	Snape	Columbus	56789	severus@fabrikam.com	OH	130000
...	...	...	...	...	...	MA	...

ADF

Azure Data Factory



# > ADF | DATA FACTORY | RESOURCES



The screenshot shows the Microsoft Azure 'All resources' page for the 'Georgian College' subscription. The page lists five resources:

Name	Type	Resource group	Location	Subscription
azurestorage1979	Storage account	Georgian_College	Brazil South	Azure for Students
rl-database-sql (rl-server-bdat/rl-database-sql)	SQL database	Georgian_College	East US	Azure for Students
rl-datafactory-csv	Data factory	Georgian_College	East US	Azure for Students
rl-server-bdat	SQL server	Georgian_College	East US	Azure for Students
sqlvapimpp32yosiw2	Storage account	Georgian_College	East US	Azure for Students

A red arrow points to the 'rl-datafactory-csv' row, highlighting the Data Factory resource.

# > ADF | DATA FACTORY | SETUP

Copy Data (rl-datafactory-csv)

- 1 Properties Recurring copy
- 2 Source Azure Blob Storage
- 3 Destination Azure SQL Database
- 4 Settings Fault tolerance, Performance
- 5 Summary
- 6 Deployment

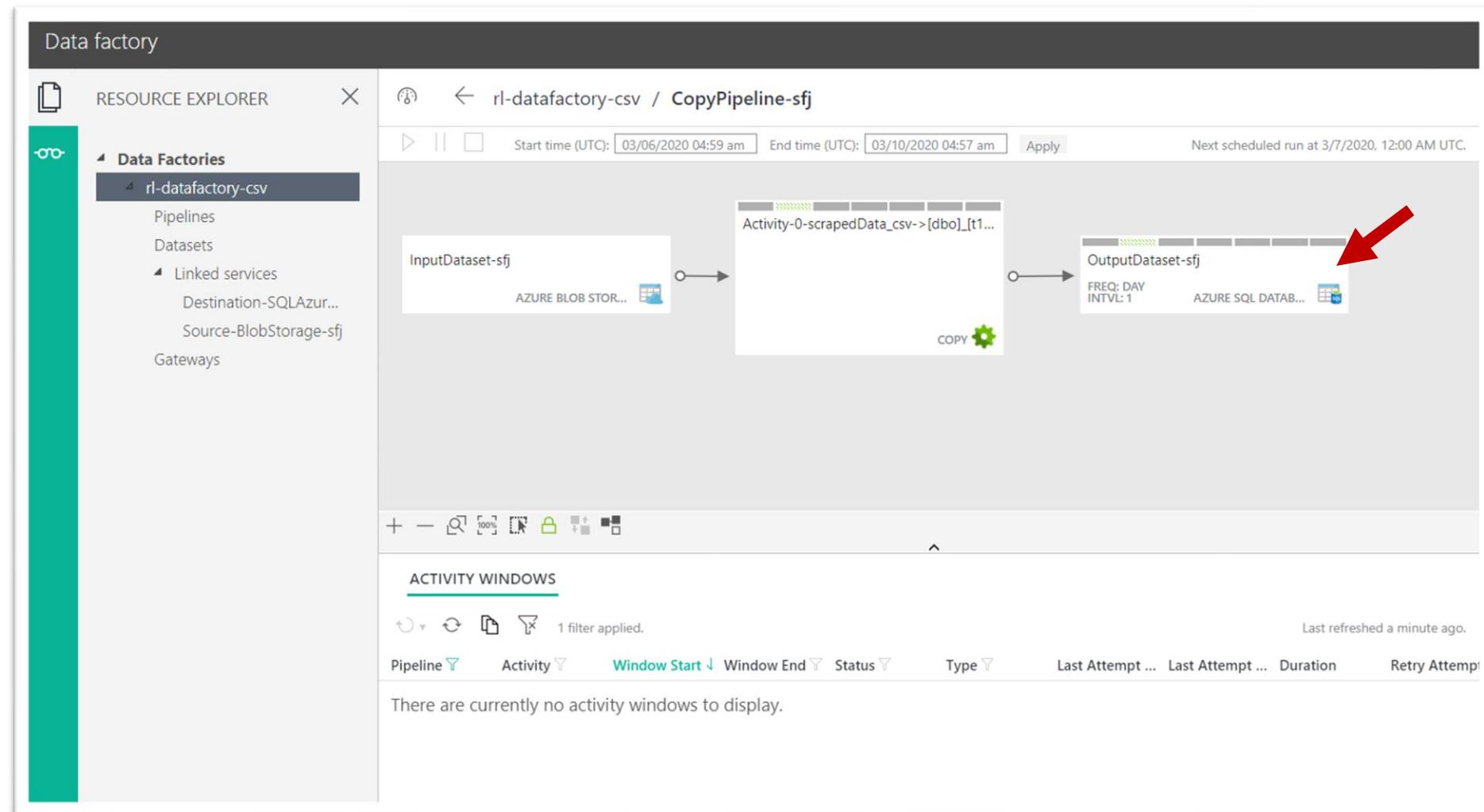
Azure Blob Storage webscraping Region: Brazil South      Copy Run Time Region: East US      Azure SQL Database 1 table(s) Region: East US

Deployment complete

- ^ Validating runtime environment ✓ Validation passed ✓
- ▼ Registering Connections ✓
- ▼ Creating Datasets ✓
- ▼ Creating Pipelines ✓

[Click here to monitor copy pipeline](#)

# > ADF | DATA FACTORY | PIPELINE



# Data Quality



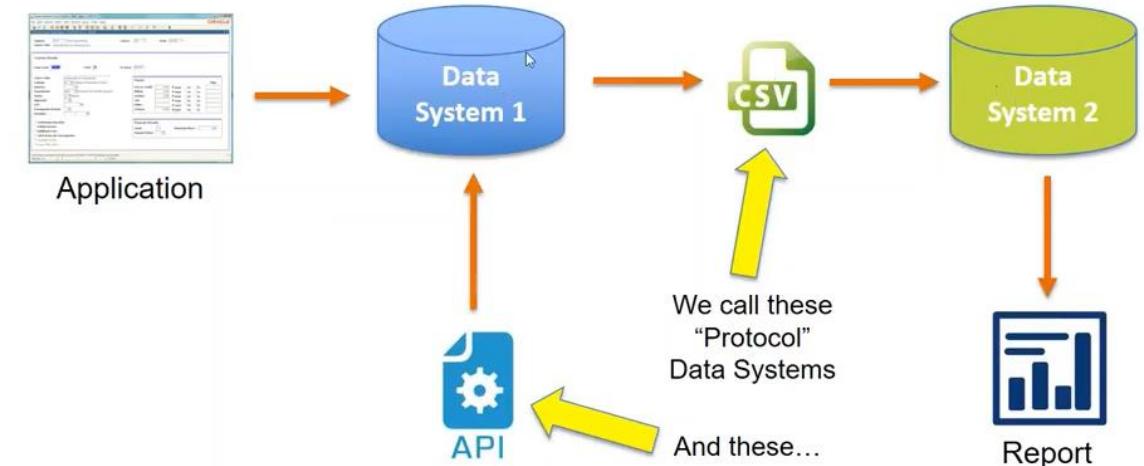
# > Data Lineage

<https://youtu.be/lUxgWb6WpF0>

Data lineage includes the **data origin, what happens to it and where it moves over time.**

Data lineage gives visibility while greatly simplifying the ability to trace errors back to the root cause in a data analytics process.

## Sources, Targets, and Transformations



# > Data Lineage

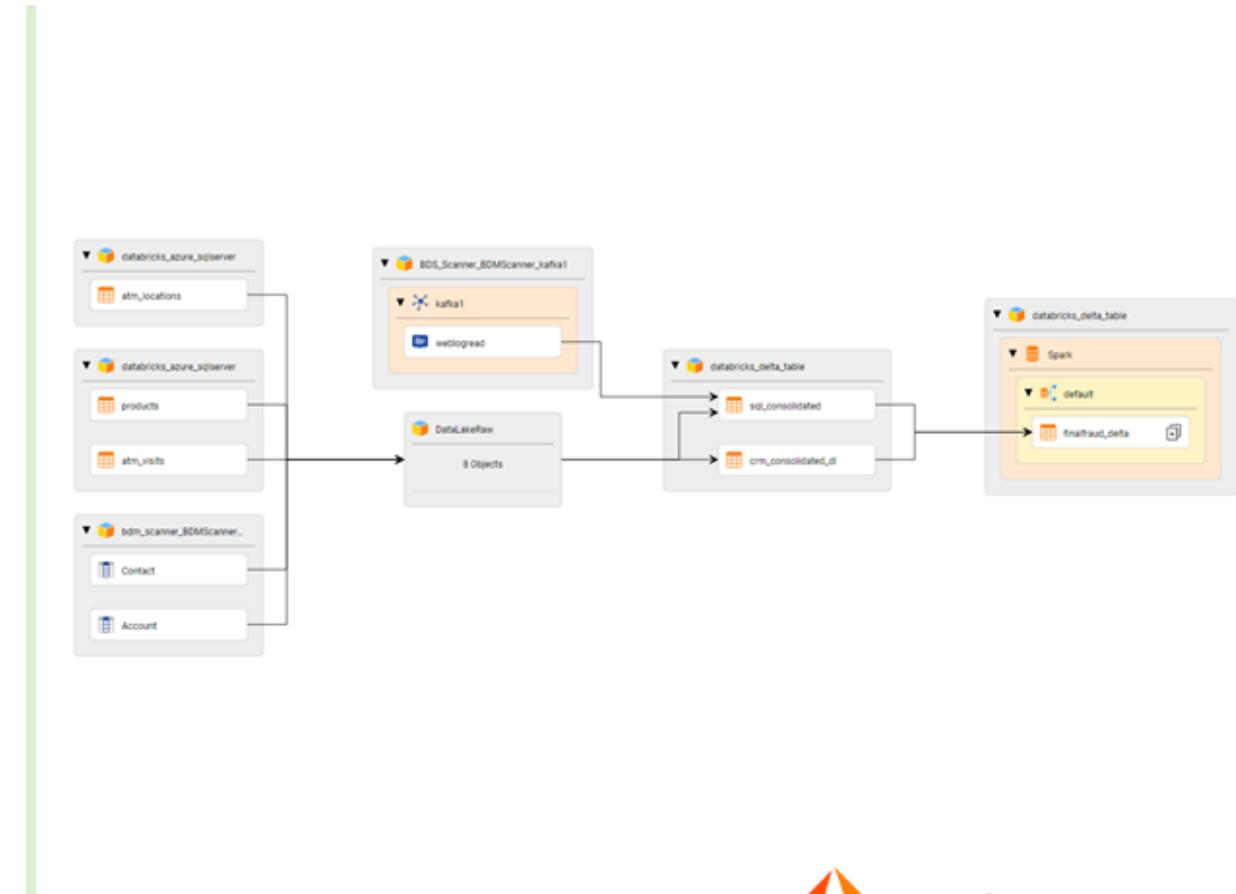
## Data Lineage

You can view data lineage for objects in the Metadata Manager warehouse.

Data lineage shows the origin of the data, describes the path, and shows how it arrives at the target. Use data lineage to analyze data flow and troubleshoot data transformation errors.

Metadata Manager can trace the data path when a network of applications share and transform the same set of data. It uses the metadata that applications store for each transformation procedure to determine how each application moves or transforms data. It displays this information in a data lineage diagram.

Metadata Manager can show data lineage for objects in one or more resources. You can view data lineage for the following object types:



# > Data Lineage

---

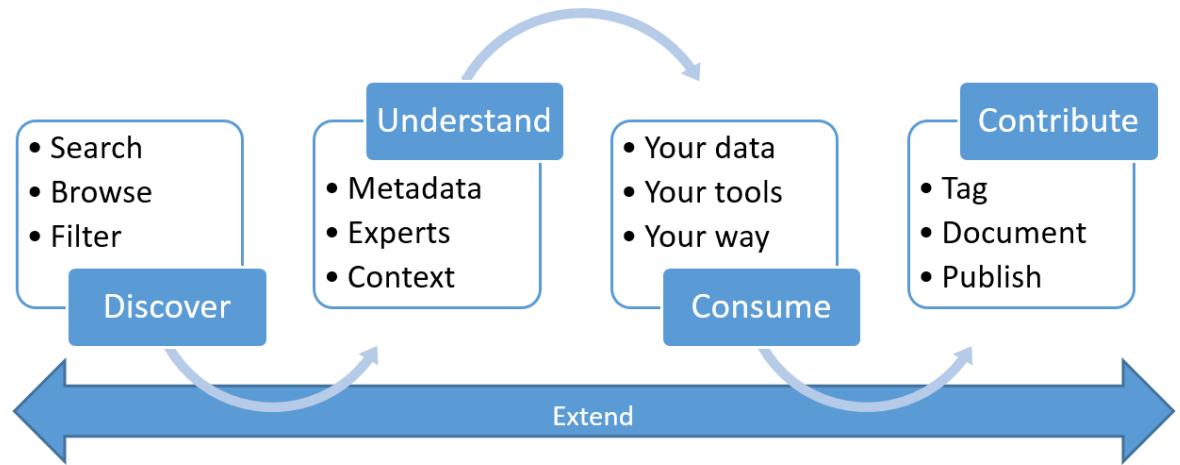
- Tasks
- Transformations
- Data structures
- Fields
- Reports
- Business terms

By default, Metadata Manager does not repeat any objects in the lineage diagram to keep the diagram simple. However, you can configure Metadata Manager to repeat objects that appear in different locations of the lineage diagram. For example, Metadata Manager can display parts of a PowerCenter mapping in different places.



# > Data Catalog

## Azure Data Catalog



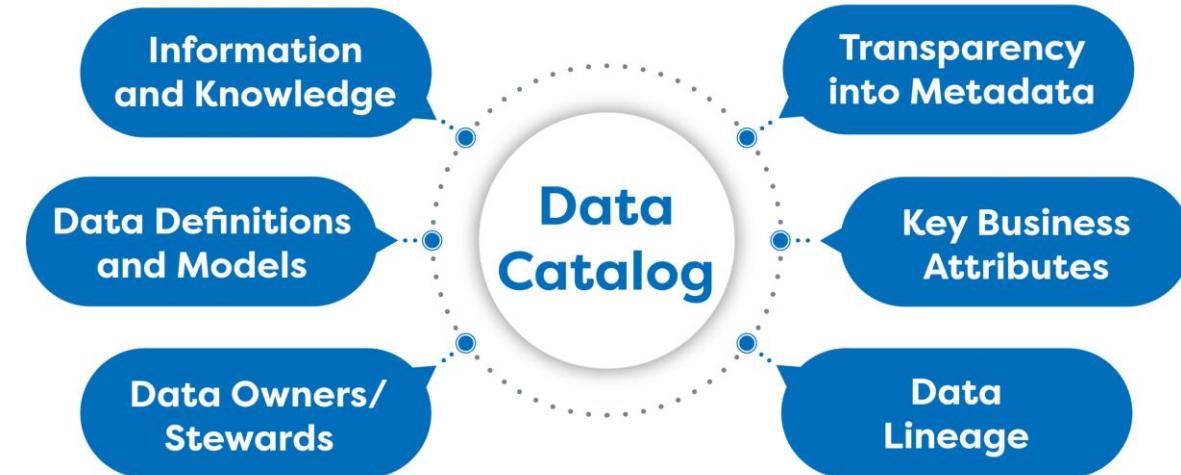
Data Catalog provides a cloud-based service into which a data source can be registered. The data remains in its existing location, but a copy of its metadata is added to Data Catalog, along with a reference to the data-source location. The metadata is also indexed to make each data source easily discoverable via search and understandable to the users who discover it.

# > Data Catalog

## Discovery challenges for data producers

Annotating data sources with descriptive metadata is often a lost effort. Client applications typically ignore descriptions that are stored in the data source.

- Creating documentation for data sources is often a lost effort. Keeping documentation in sync with data sources is an ongoing responsibility. Users may lack trust in documentation that's perceived as being out of date.
- Creating and maintaining documentation for data sources is complex and time-consuming. Making that documentation readily available to everyone who uses the data source can be even more so.
- Restricting access to data sources and ensuring that data consumers know how to request access is an ongoing challenge.



<https://www.informatica.com/ca/products/data-catalog.html>



<https://docs.microsoft.com/en-us/azure/data-catalog/overview>

# > Enterprise Cloud Data Management



# > Data Quality is important?

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NETFLIX

[https://databricks.com/session\\_na20/an-approach-to-data-quality-for-netflix-personalization-systems](https://databricks.com/session_na20/an-approach-to-data-quality-for-netflix-personalization-systems)

# Practice #2 / Part 1

## Azure Machine Learning Studio

### Auto Price Prediction



Azure Machine Learning

# > #2 Azure Machine Learning Studio (Classic) / Part 1

## INSTRUCTIONS:

Record a video with 5-10 minutes explaining how to use **Azure Machine Learning Studio** and your discoveries.

- Follow each of the steps detailed in the next slides and explain them.
- Explain that you are loading the file, select columns, cleaning missing data, splitting the file, etc.
- Explain why you are performing each step.
- Make your conclusion of the predicted values.
- Evaluate your model and explain the results.
- Analyze all the steps you performed and think how should be the behavior (processes) of an enterprise solution with the same purpose. What are the differences?

*In your video explain how and why you performed each step and explain the final result.*

## EVALUATION:

**Mark: 10 points (part 1 and 2)**

- Ensure that you recorded yourself using the tool or using your own screenshots
- Ensure that you recorded all the performed steps
- Ensure that you analysed the results
- Explain what kind of ML you are using in this exercise and why

Will be considered: Your results, explanations, level of details, clarity to explain and presentation / video quality (preparation).

**Due date: Week 6 class**

# > Azure Machine Learning Studio | Practice / Part 1

---

## MAIN GOAL:

Your main goal is to predict the price of a car based on different variables such as make and technical specifications.

### MAIN STEPS:

#### Create a model

- Get the data
- Prepare the data
- Define features

#### Train the model

- Choose and apply an algorithm

#### Score and test the model

- Predict new automobile prices

# > Azure Machine Learning Studio | Practice

Microsoft Azure Machine Learning Studio (classic)

Azure Machine Learning designer is generally available

Try it now!

Welcome to Azure Machine Learning Studio (classic)

Try it for free

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Updates

Simplify and accelerate AI for the entire data science team with Azure Machine Learning designer

At Microsoft Ignite, we announced the general availability of Azure Machine Learning designer, the drag-and-drop workflow capability in

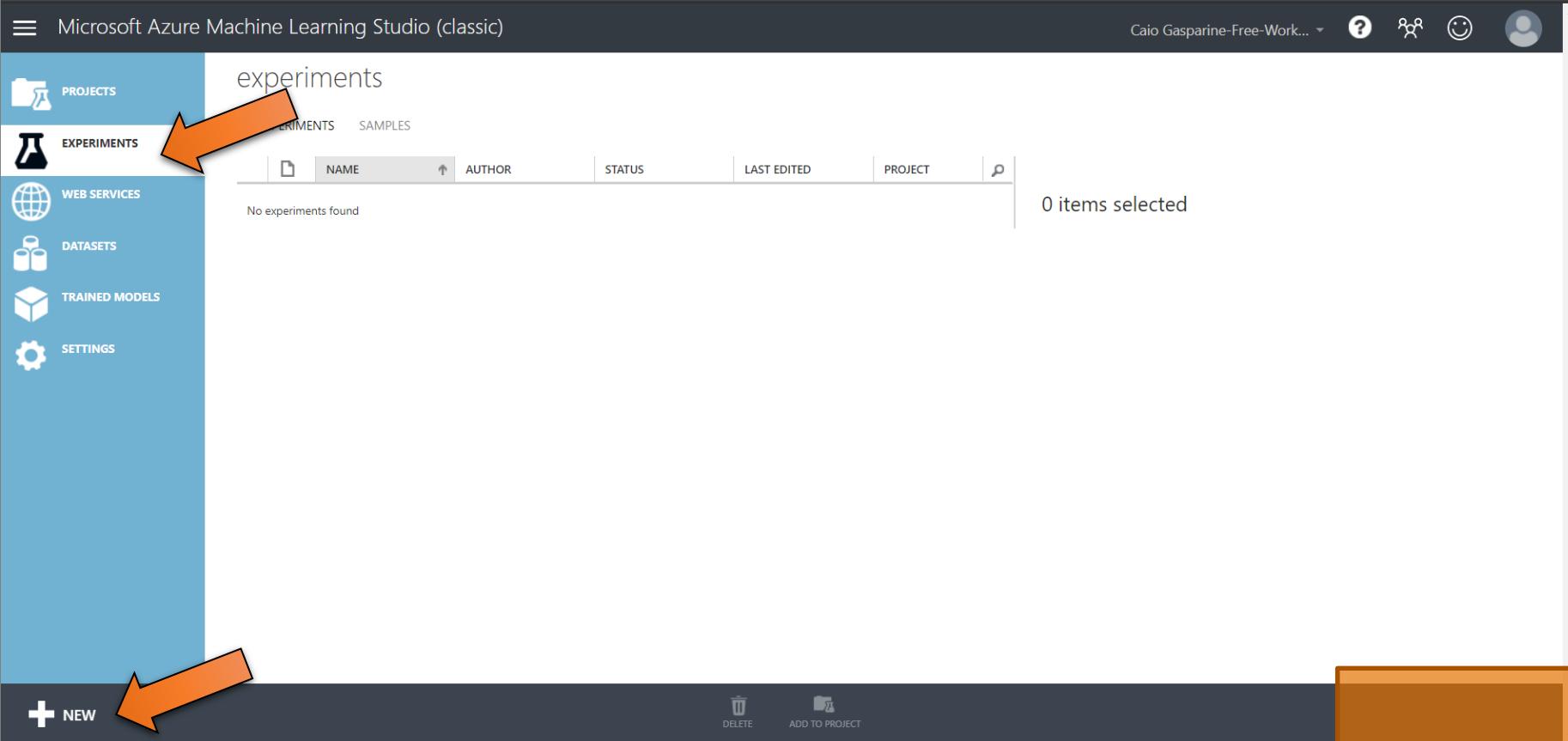
ML Studio (classic) vs Azure Machine Learning studio

Released in 2015, ML Studio (classic) was our first drag-and-drop machine learning builder. It is a standalone service that only offers a visual experience. Studio (classic) does not interoperate with Azure

<https://studio.azureml.net/>

This is an example for academic purposes

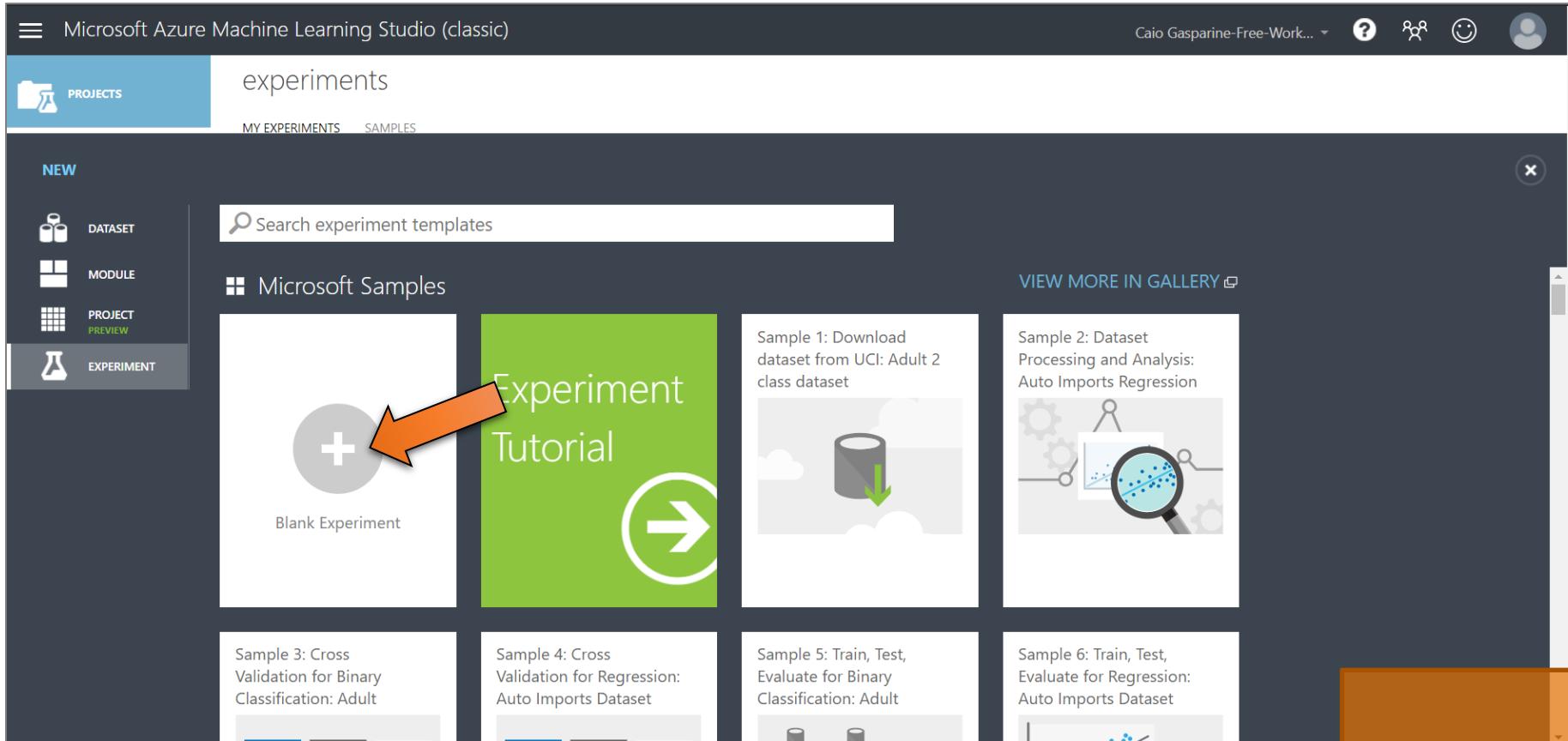
# > Azure Machine Learning Studio | Practice



The screenshot shows the Microsoft Azure Machine Learning Studio (classic) interface. The left sidebar has icons for PROJECTS, EXPERIMENTS (highlighted with an orange arrow), WEB SERVICES, DATASETS, TRAINED MODELS, and SETTINGS. The main area is titled 'experiments' and shows a table with columns: NAME, AUTHOR, STATUS, LAST EDITED, and PROJECT. A message says 'No experiments found'. At the bottom, there are 'DELETE' and 'ADD TO PROJECT' buttons. A status bar at the bottom indicates '0 items selected'. At the very bottom left, there is a 'NEW' button with a plus sign and a small orange arrow pointing to it.

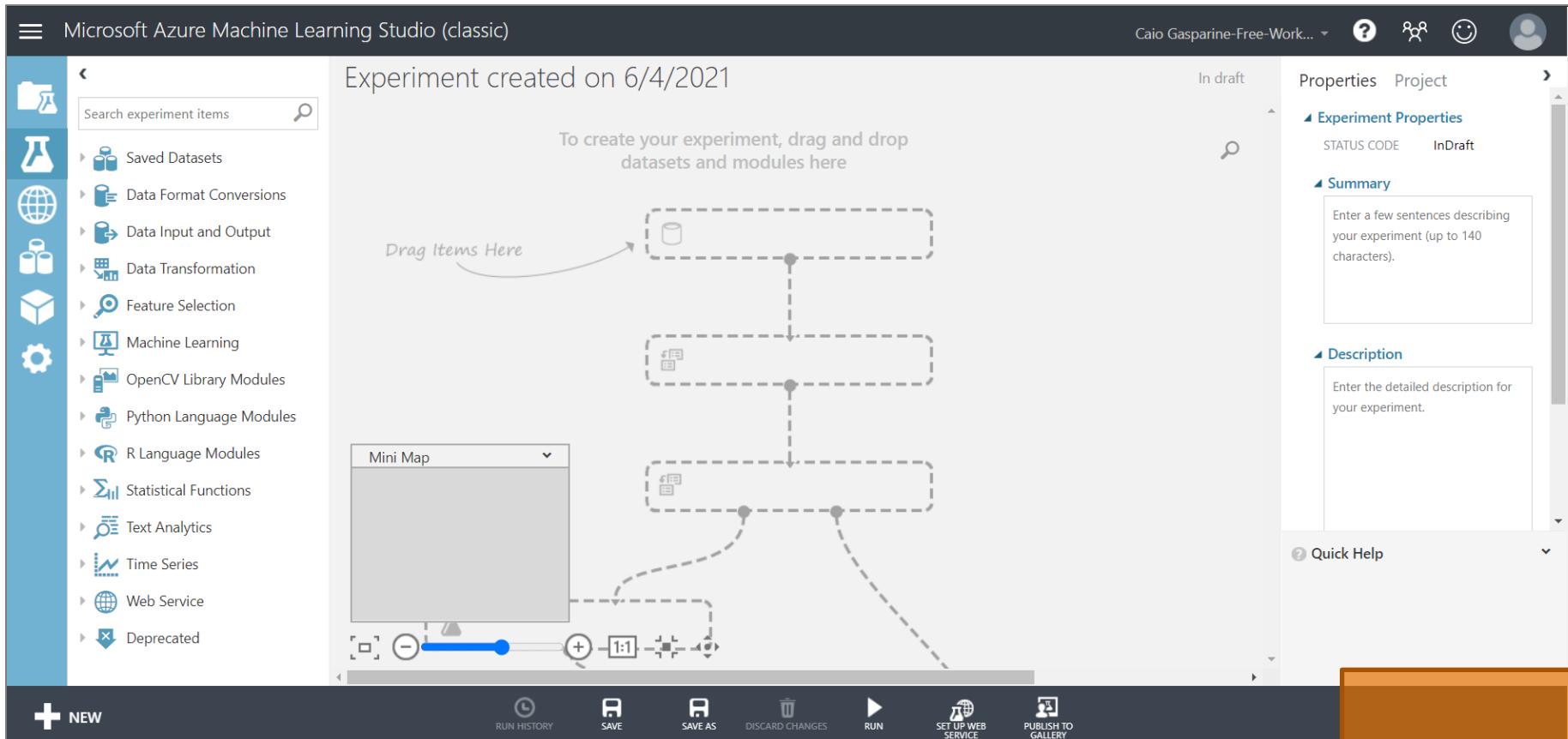
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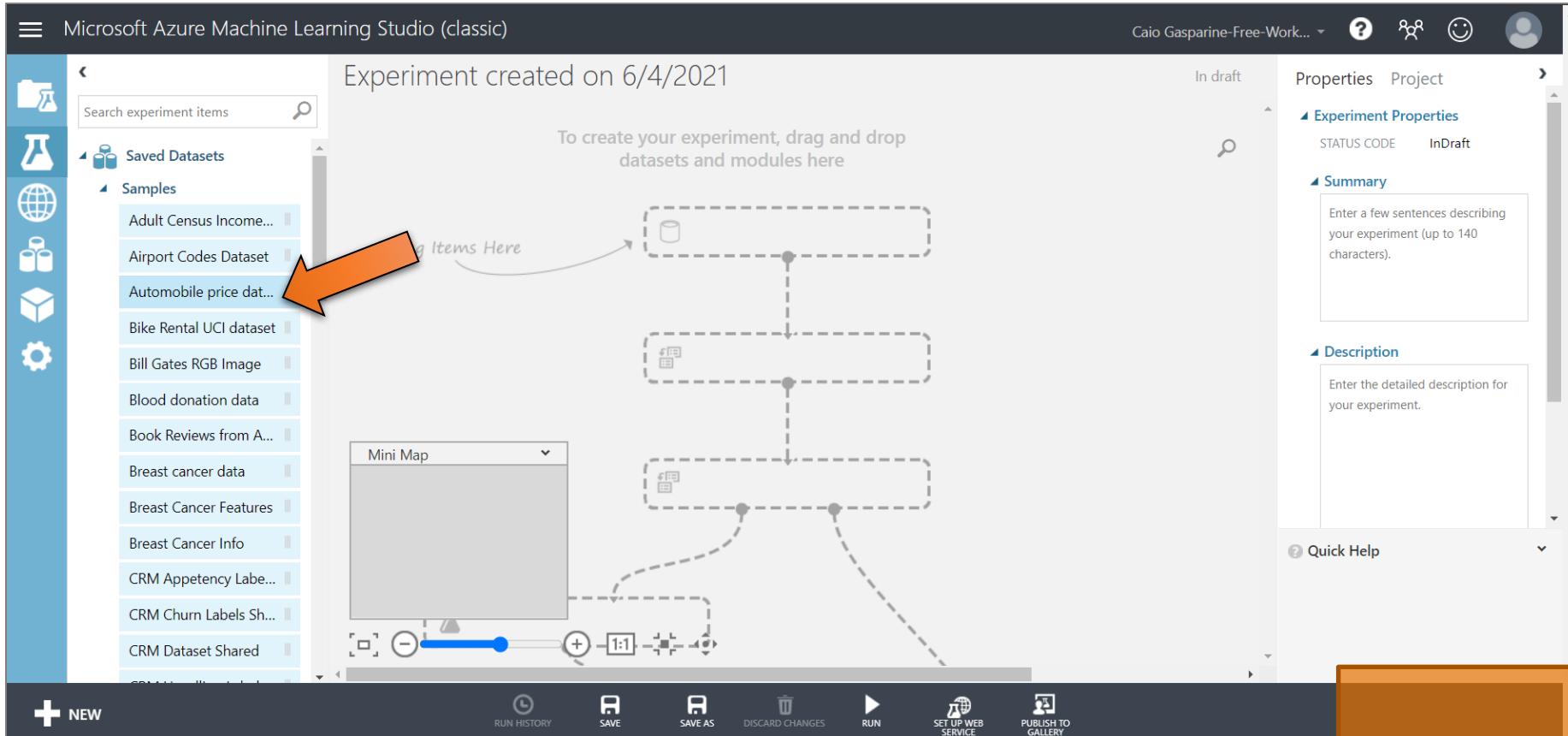
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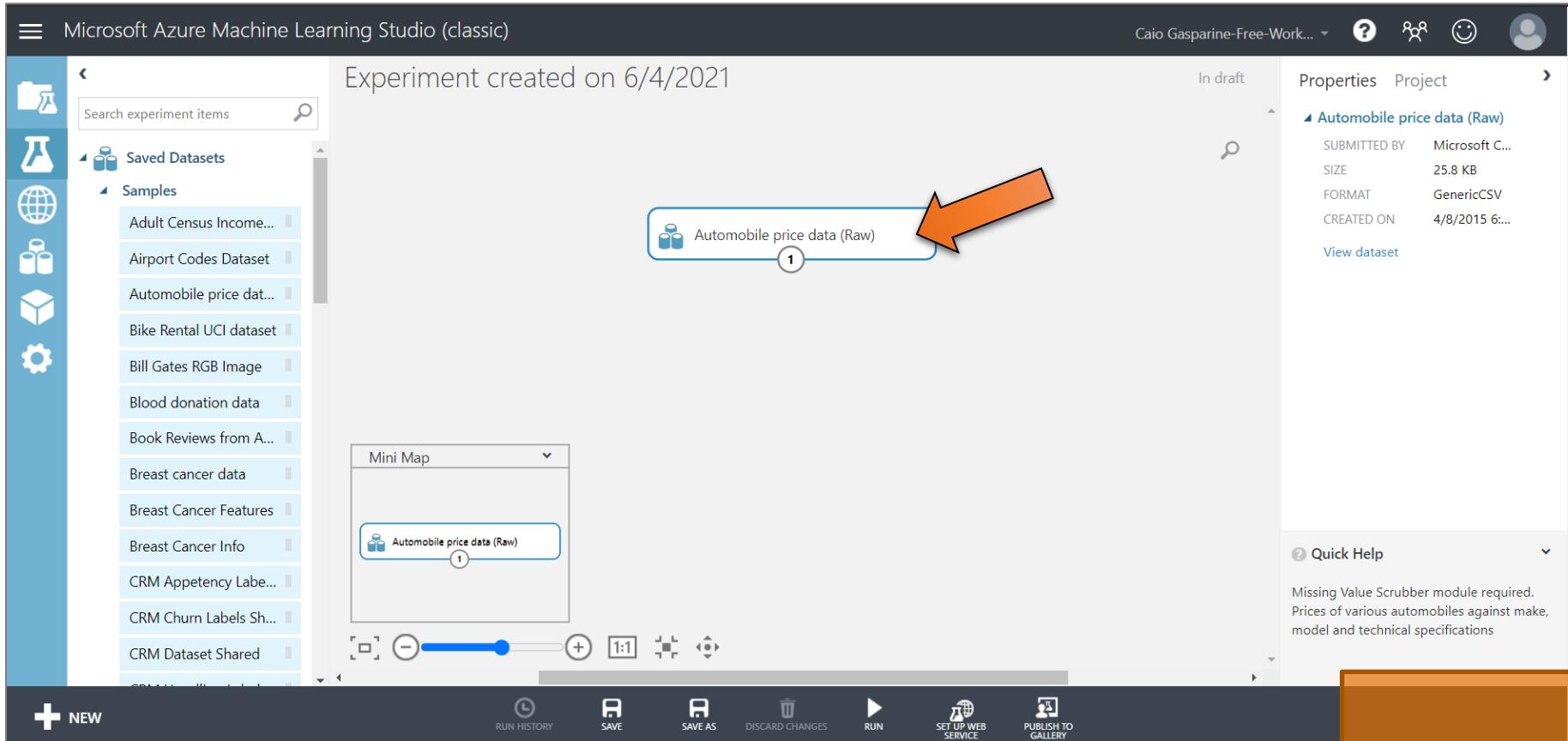
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The screenshot shows the Microsoft Azure Machine Learning Studio (classic) interface. On the left, there's a sidebar with icons for saved datasets, samples, and other project components. The main area displays an experiment created on 6/4/2021, which is currently in draft status. A dataset named "Automobile price data (Raw)" is selected. A context menu is open over this dataset, showing options like Delete, Copy, Cut, Paste, and a dropdown for "dataset". The "dataset" dropdown is expanded, showing "Download", "Visualize", and "Generate Data Access Code...". An orange arrow points from the text below to the "Generate Data Access Code..." option. To the right of the dataset details, there's a "Quick Help" section with a note about missing Value Scrubber modules. The bottom navigation bar includes buttons for RUN HISTORY, SAVE, SAVE AS, DISCARD CHANGES, RUN, SET UP WEB SERVICE, and PUBLISH TO GALLERY.

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Microsoft Azure Machine Learning Studio (classic)

Experiment created on 6/4/2021

Experiment created on 6/4/2021 > Automobile price data (Raw) > dataset

rows 205 columns 26

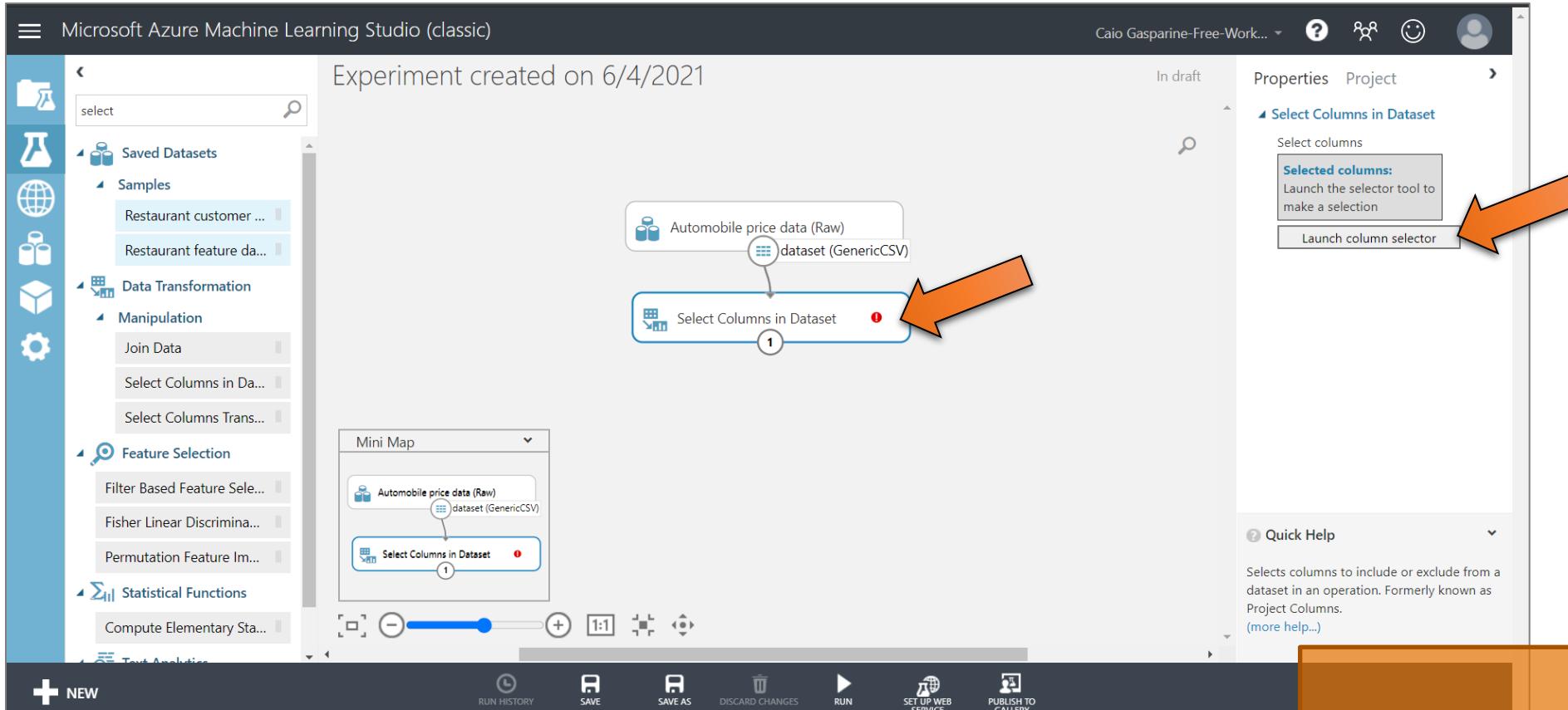
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3			alfa-romero	gas	std	two	convertible	rwd	front
3			alfa-romero	gas	std	two	convertible	rwd	front
1			alfa-romero	gas	std	two	hatchback	rwd	front
2		164	audi	gas	std	four	sedan	fwd	front
2		164	audi	gas	std	four	sedan	4wd	front
2			audi	gas	std	two	sedan	fwd	front
1		158	audi	gas	std	four	sedan	fwd	front
1			audi	gas	std	four	wagon	fwd	front
1			audi	gas	std	four	sedan	fwd	front
1			audi	turbo	high	four	sedan	4wd	front

view as

frequency

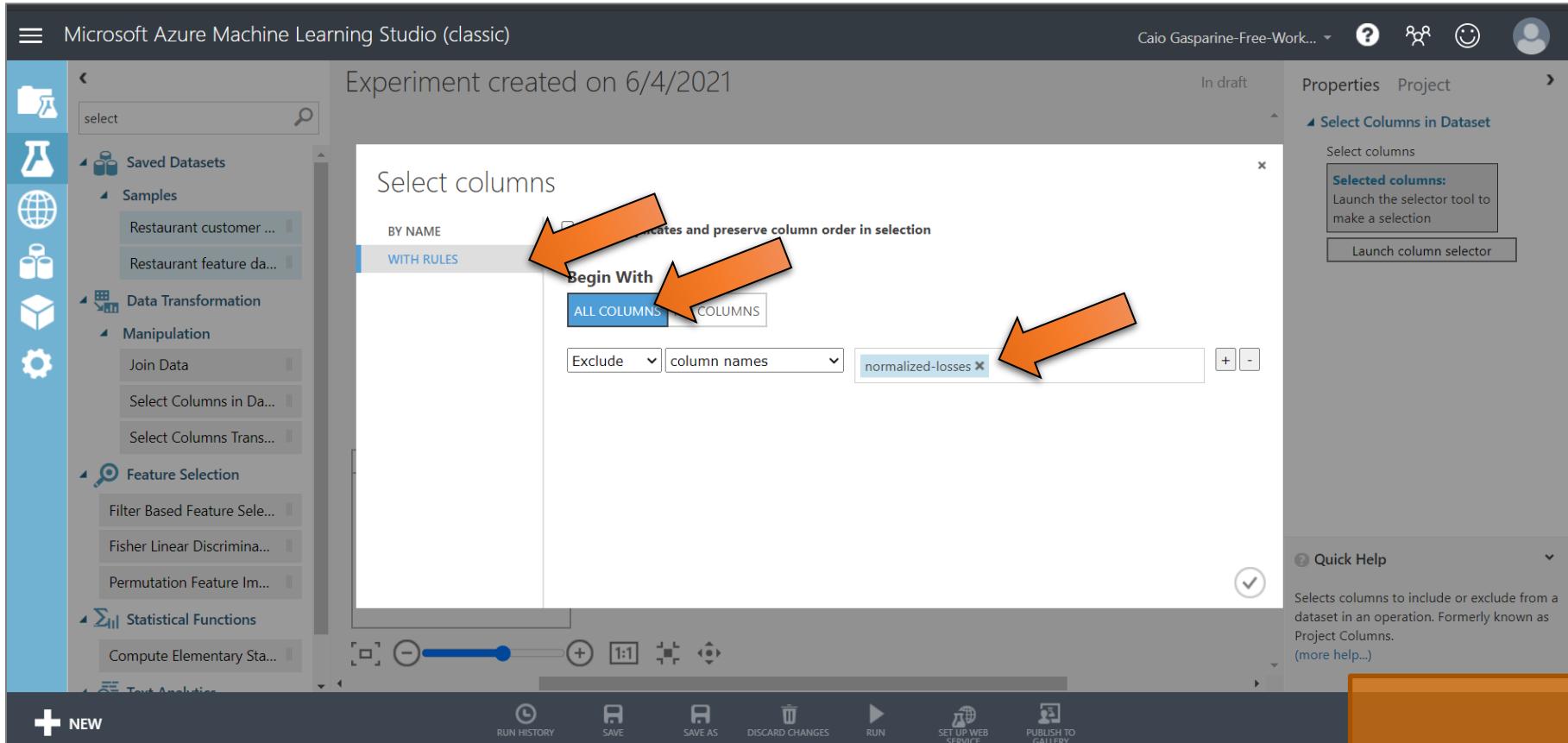
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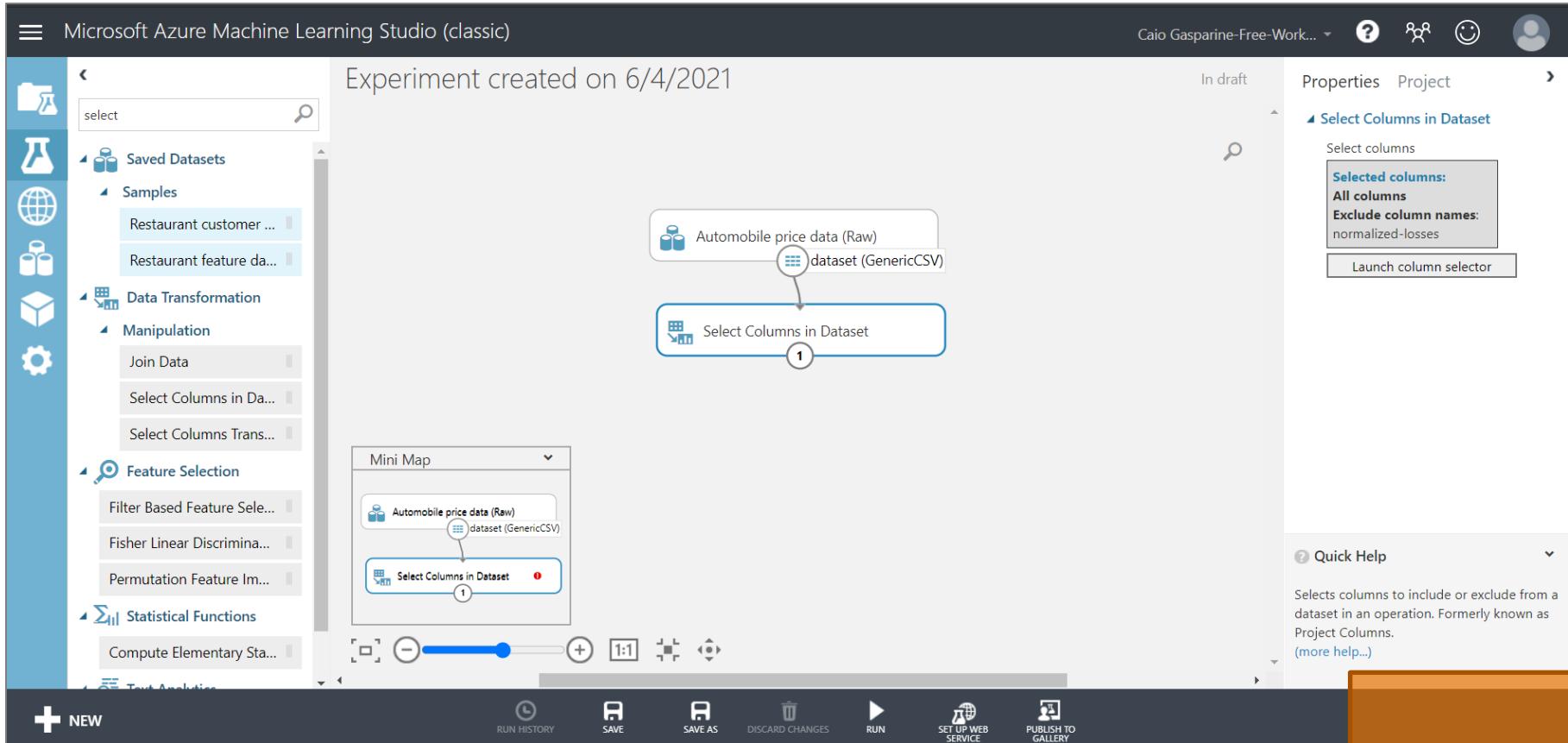
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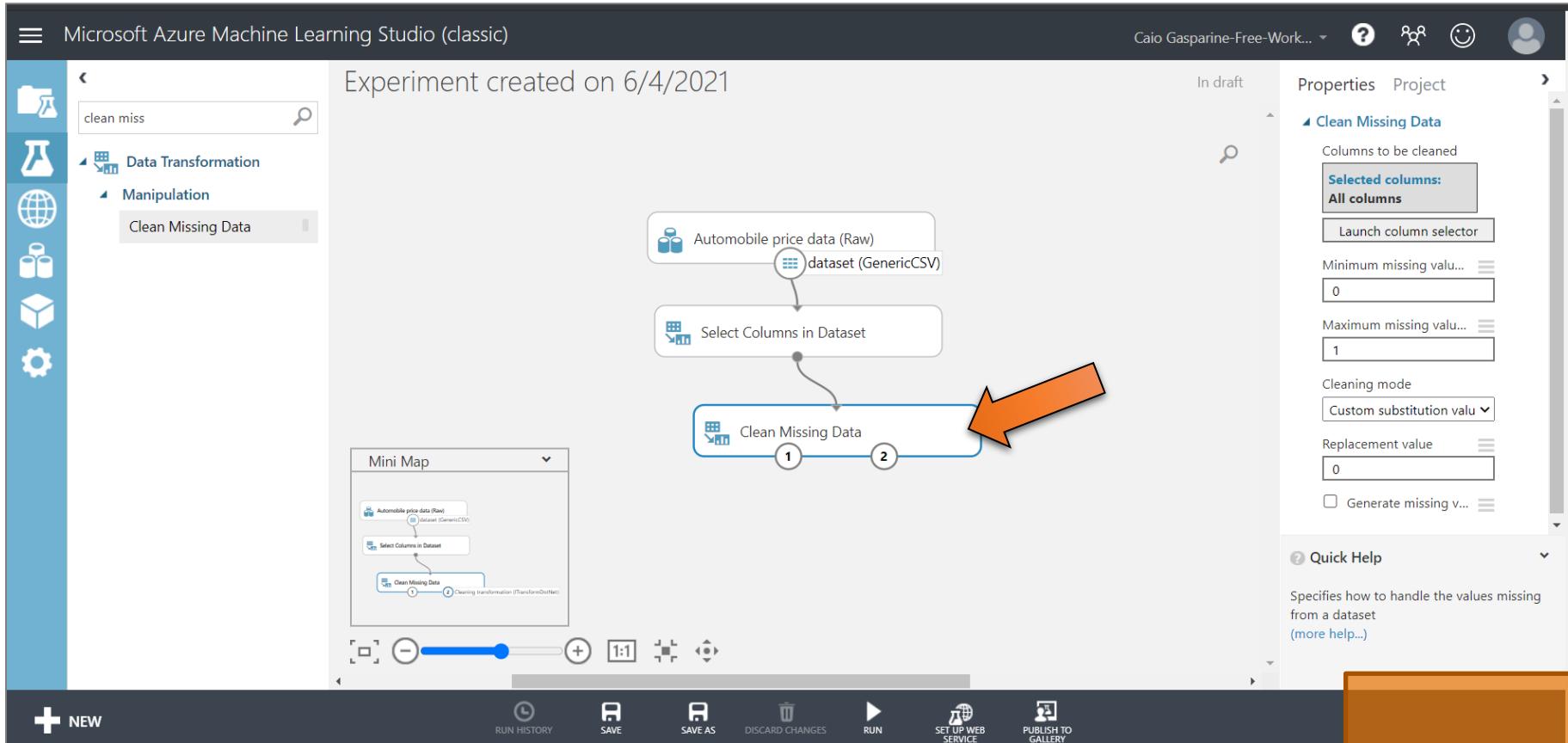
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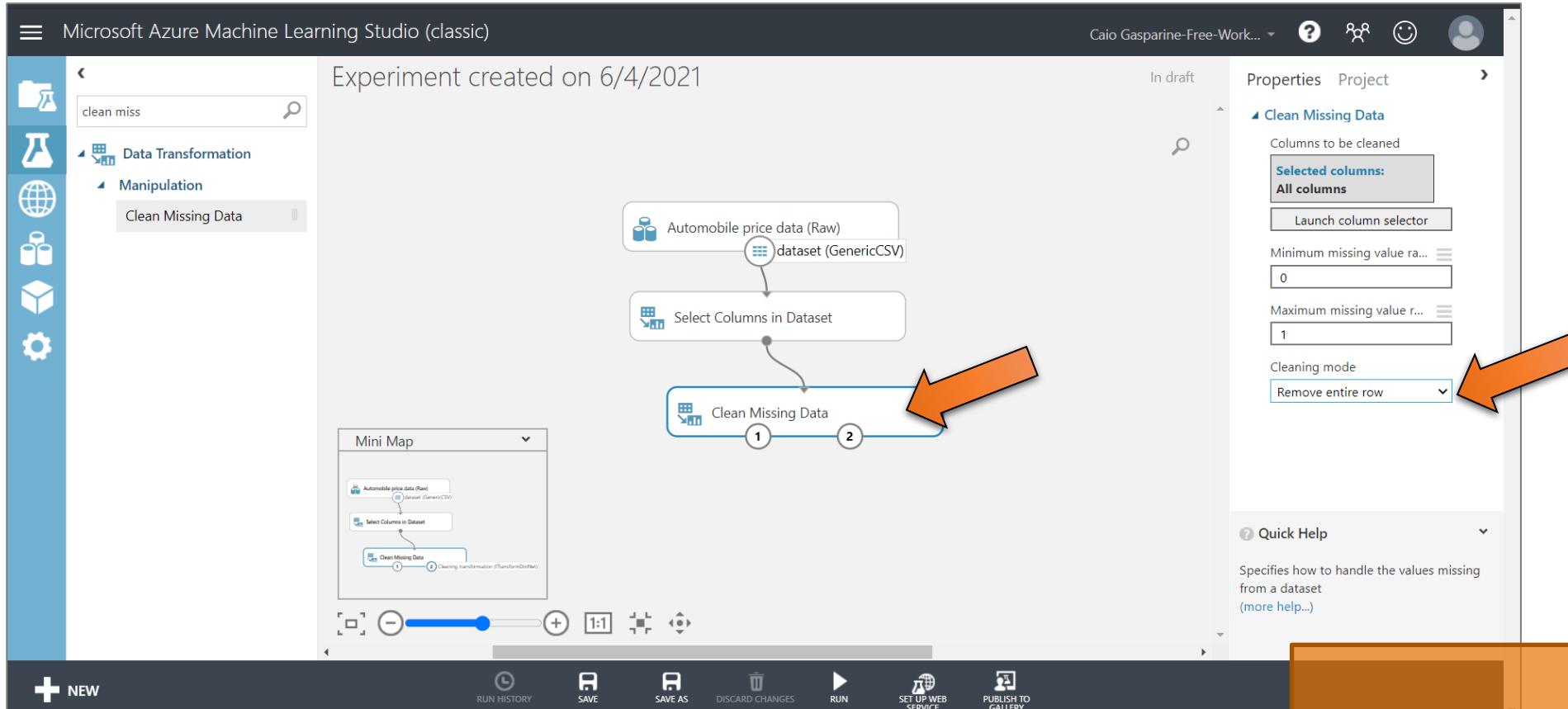
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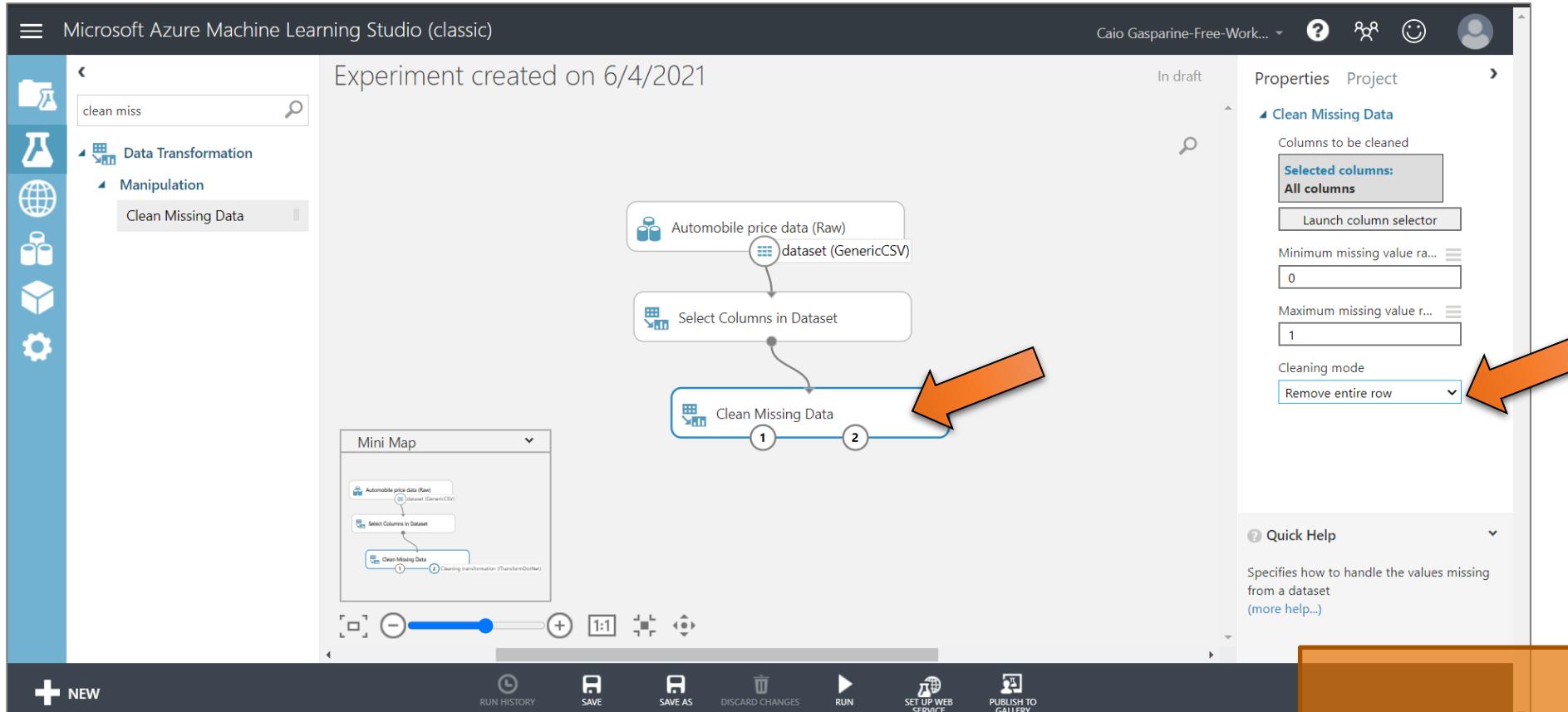
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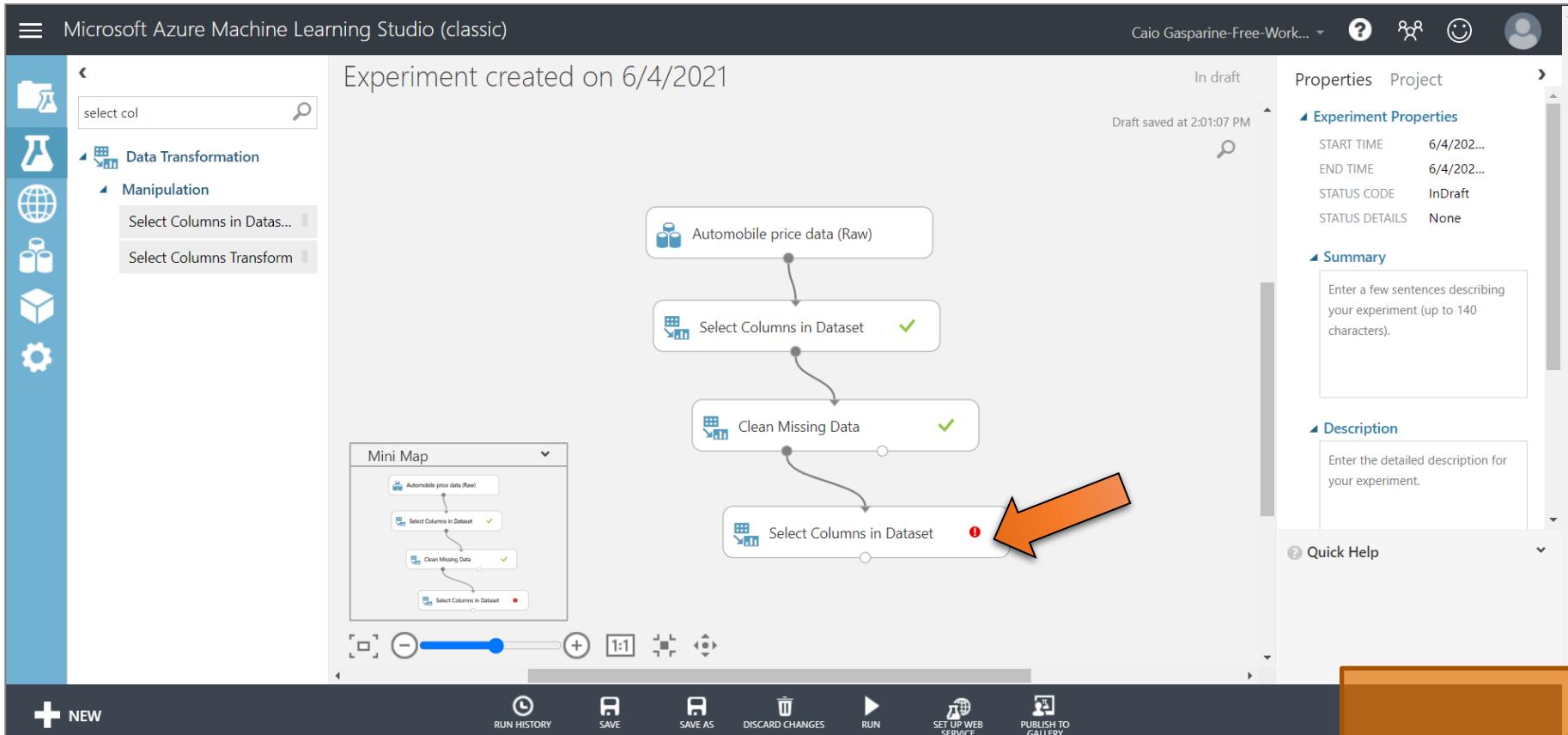
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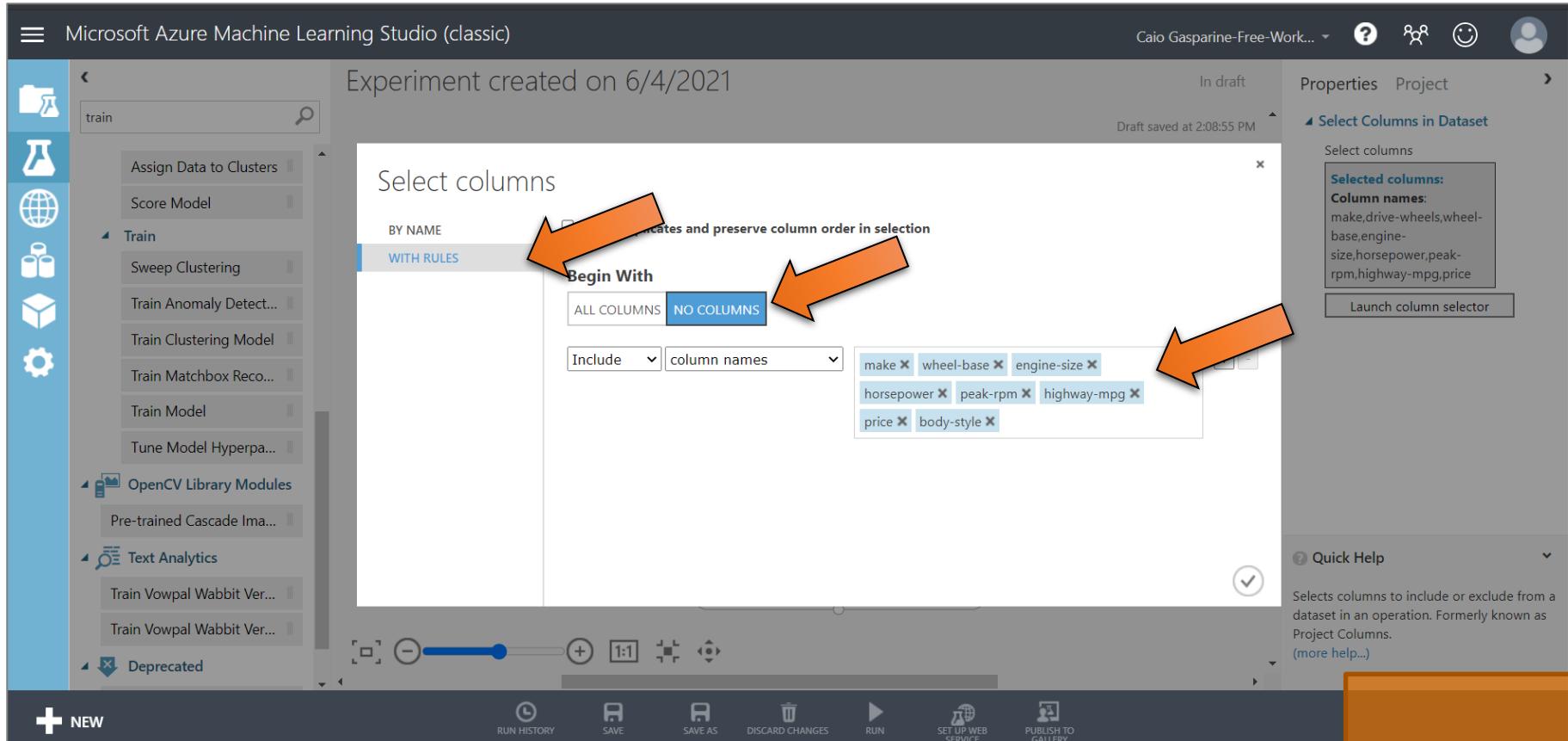
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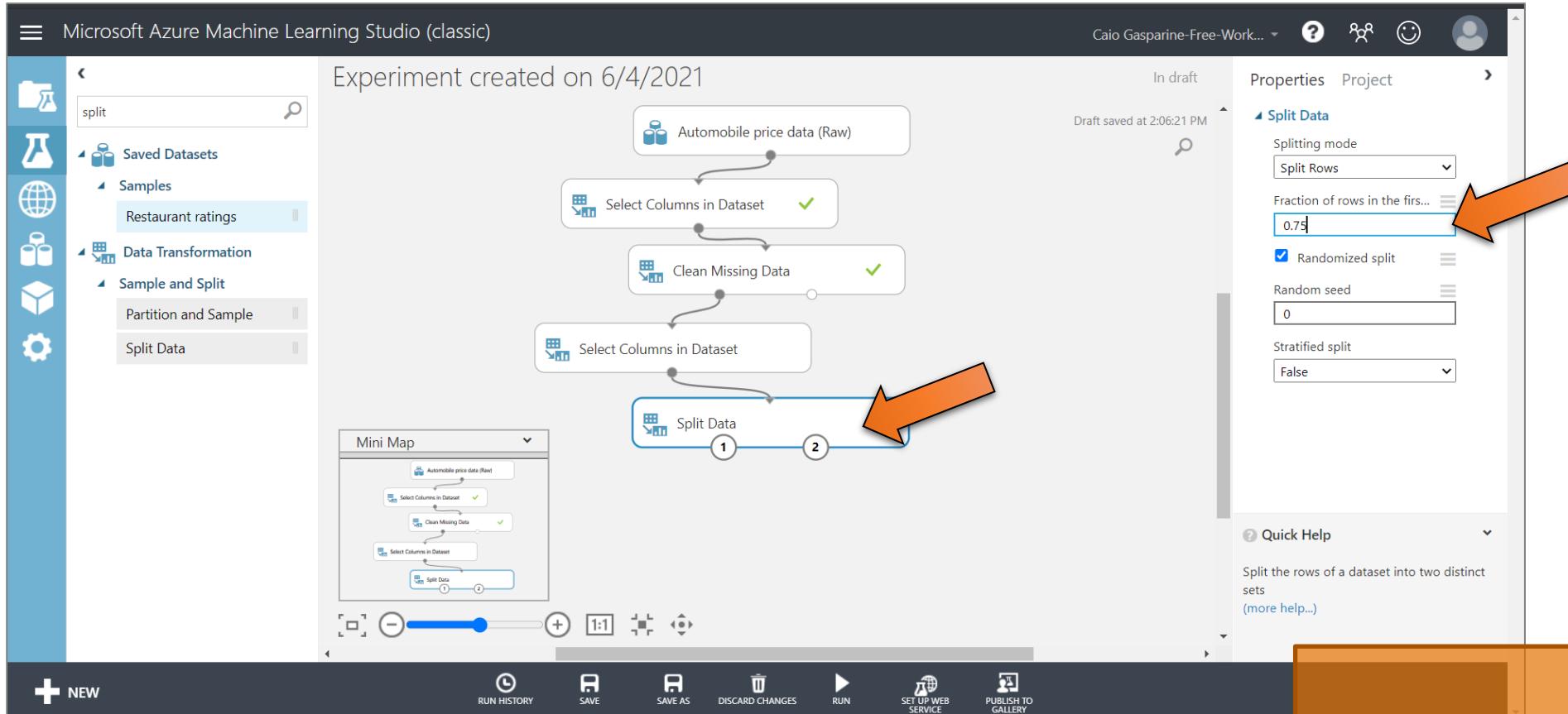
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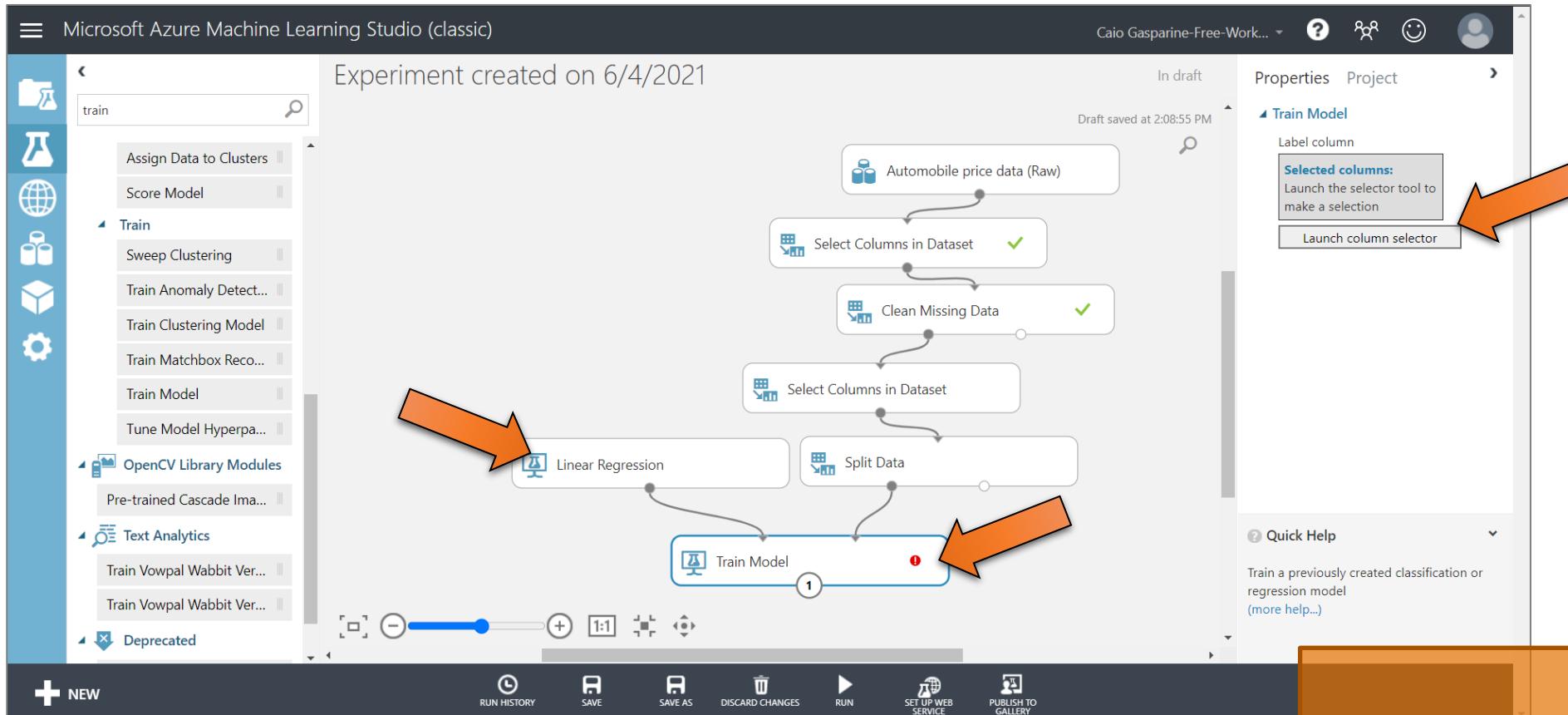
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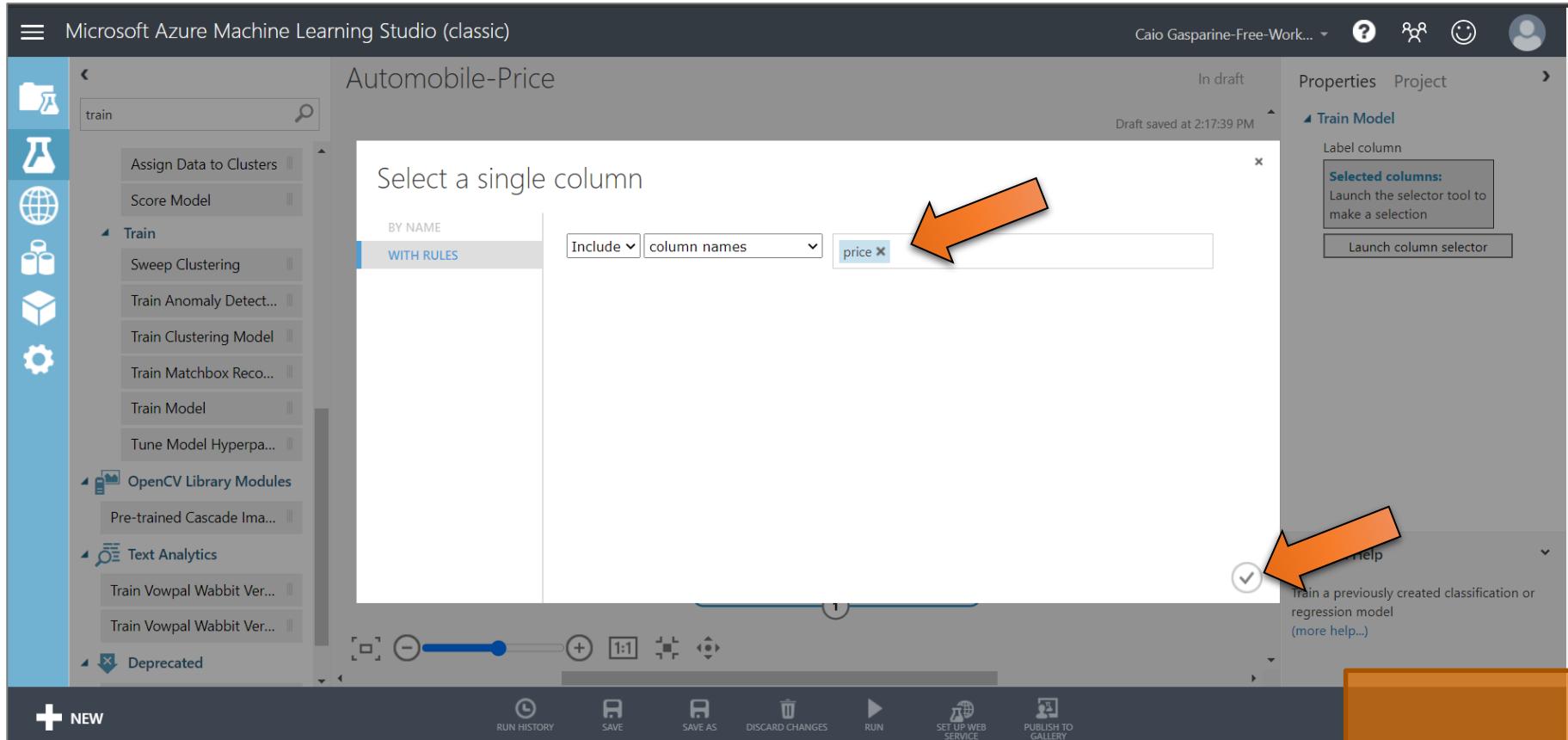
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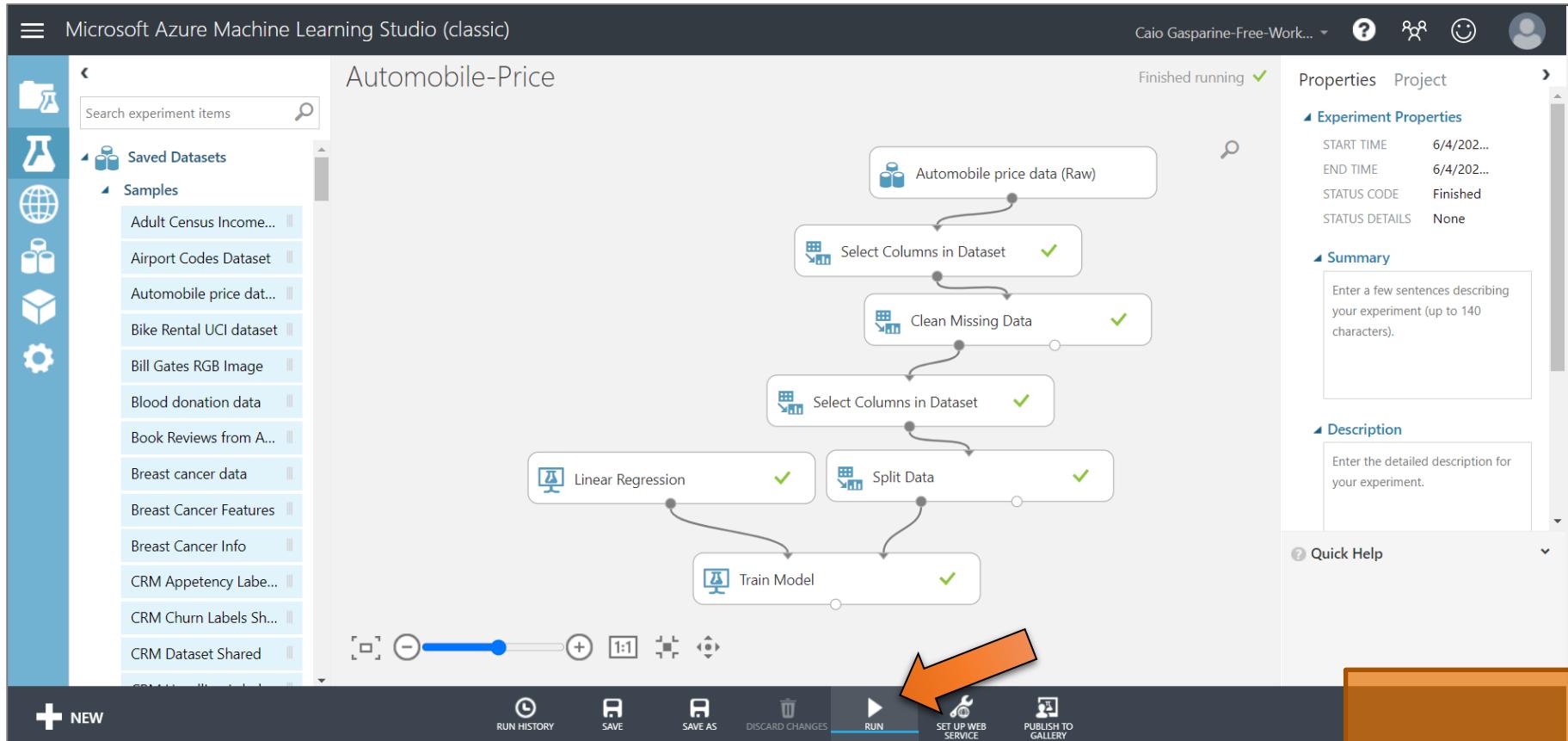


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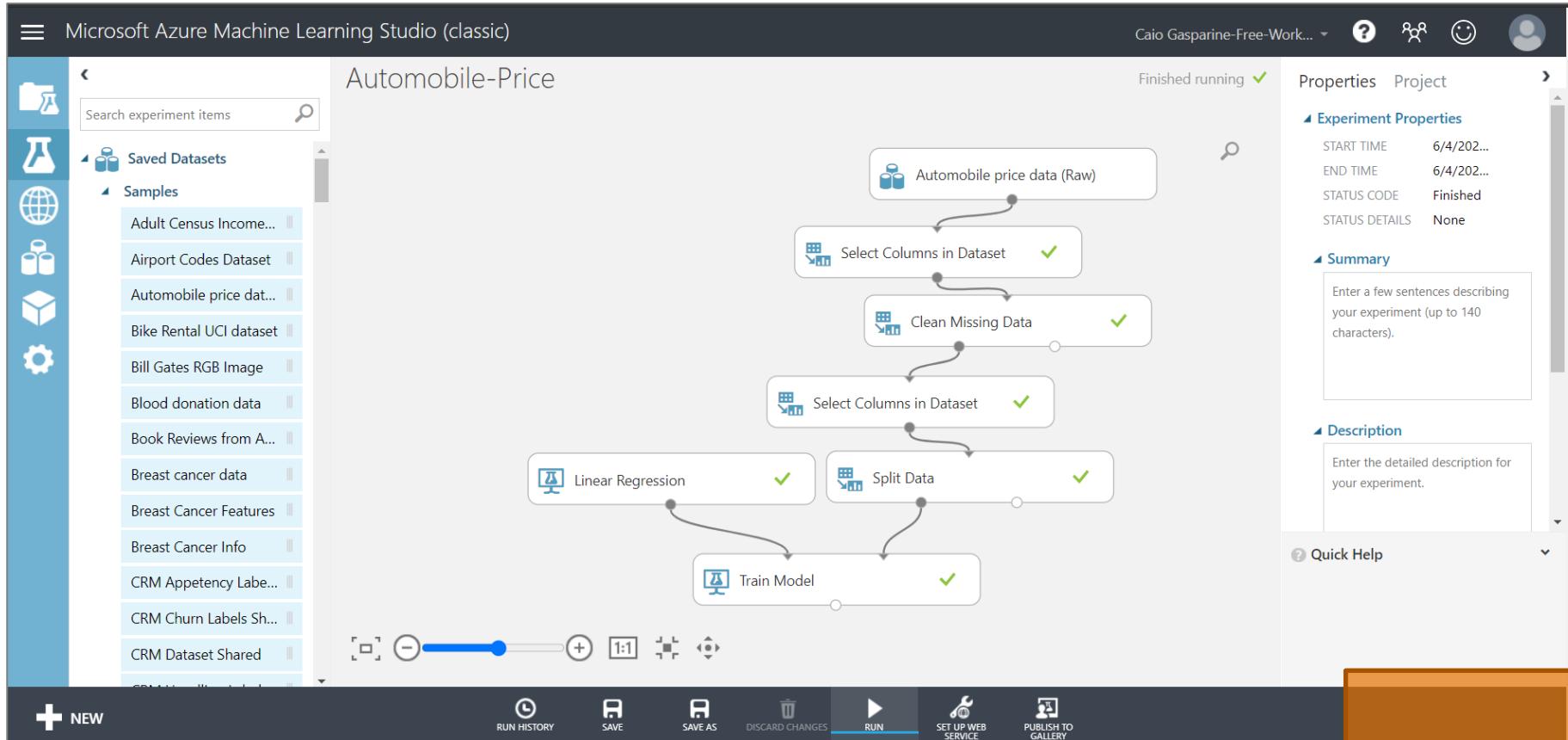


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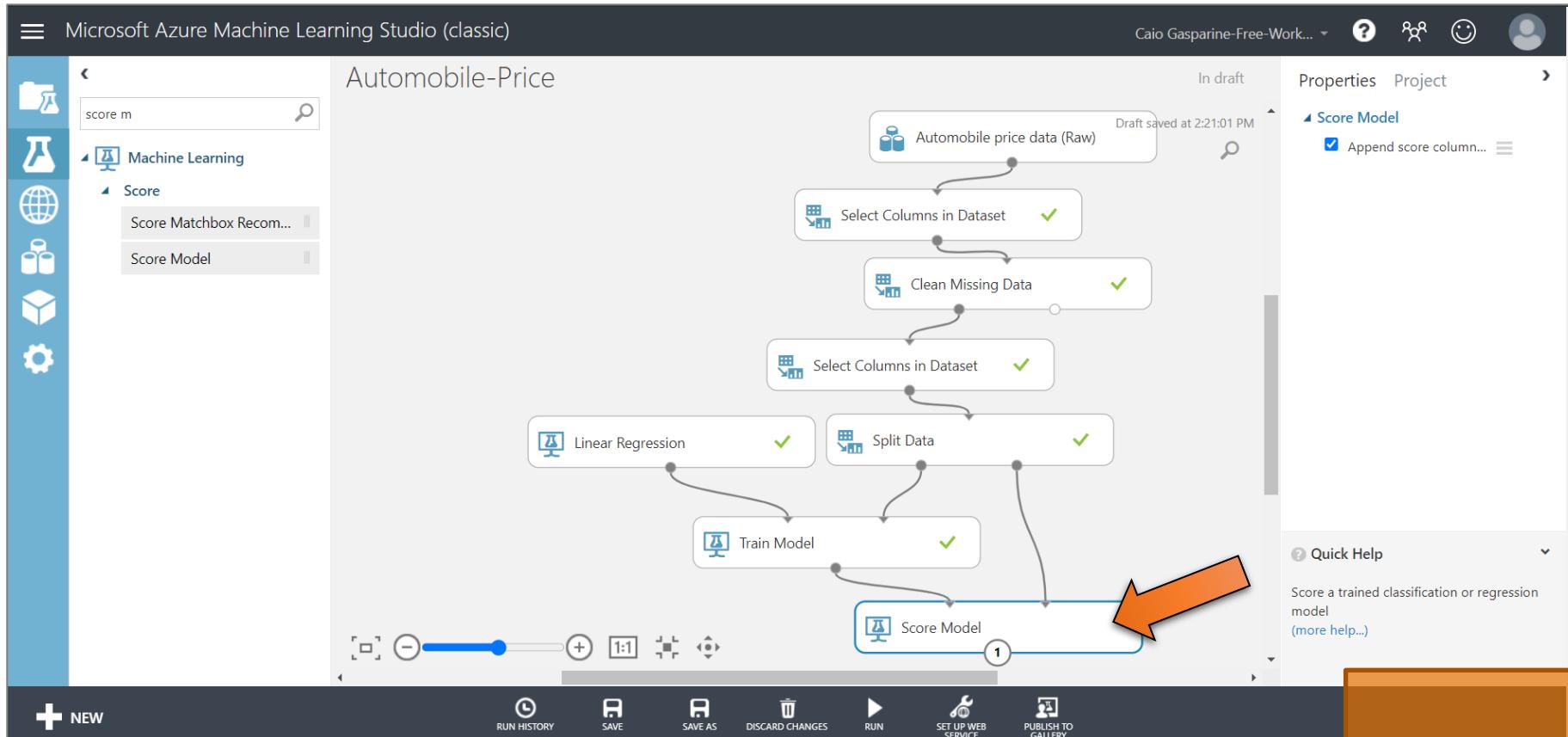
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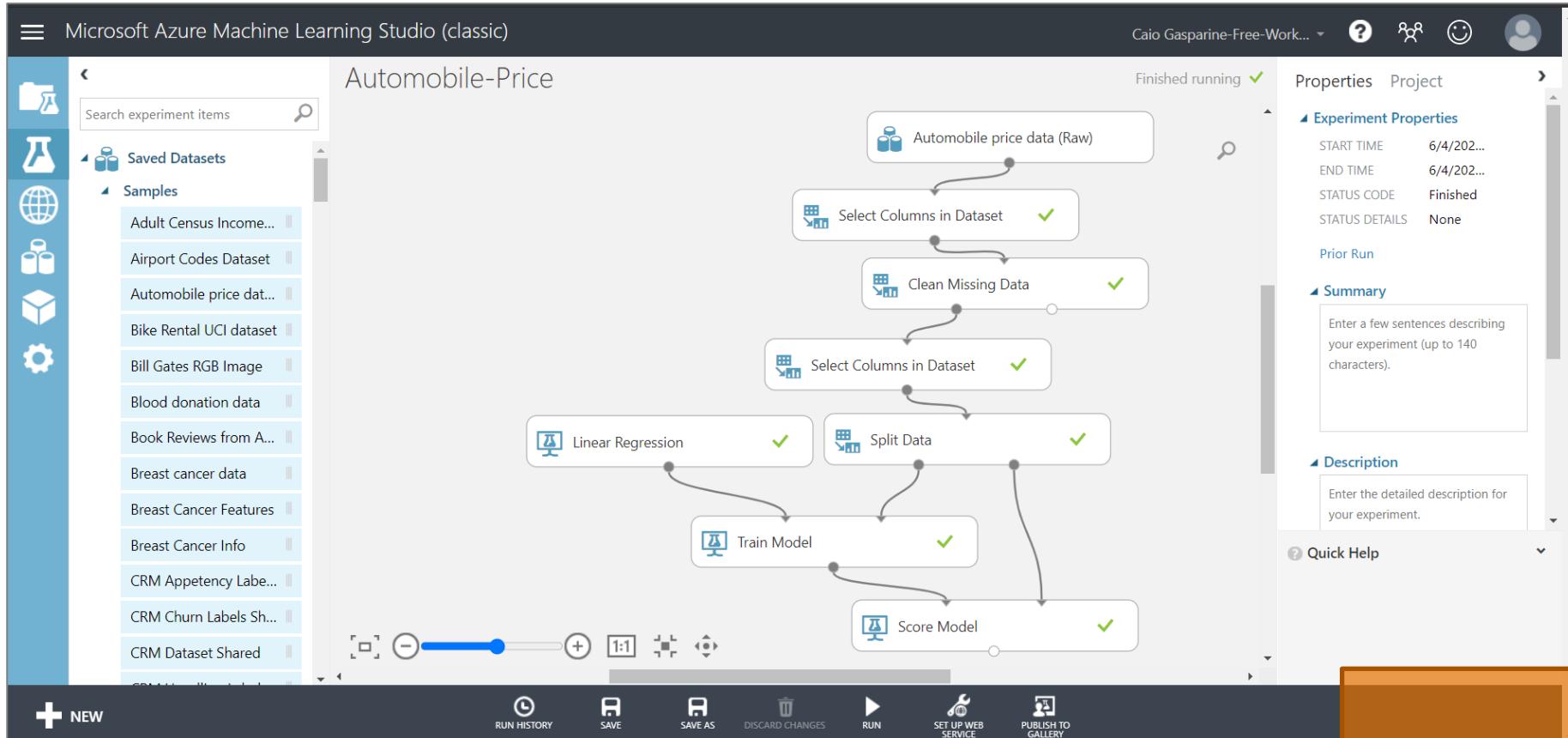
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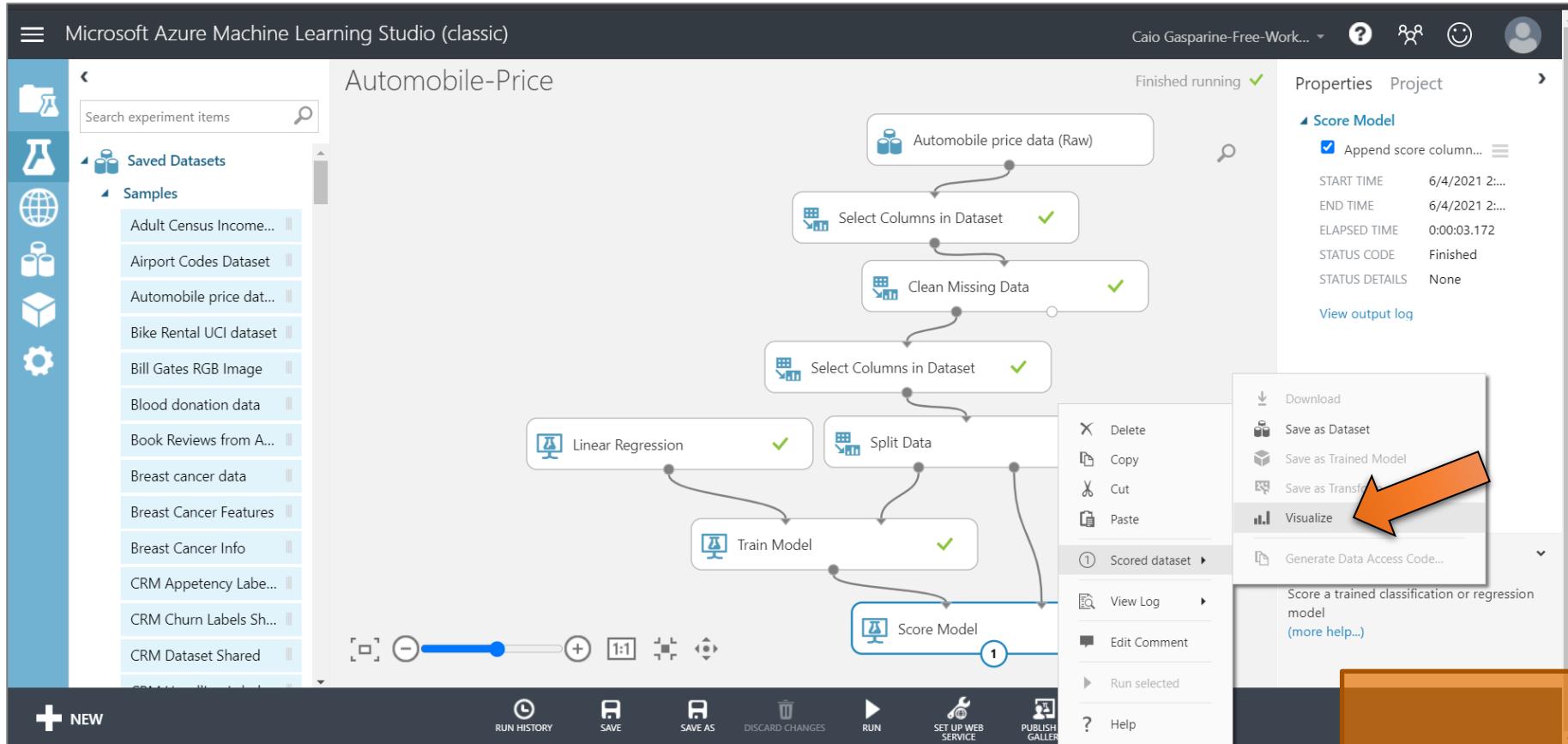
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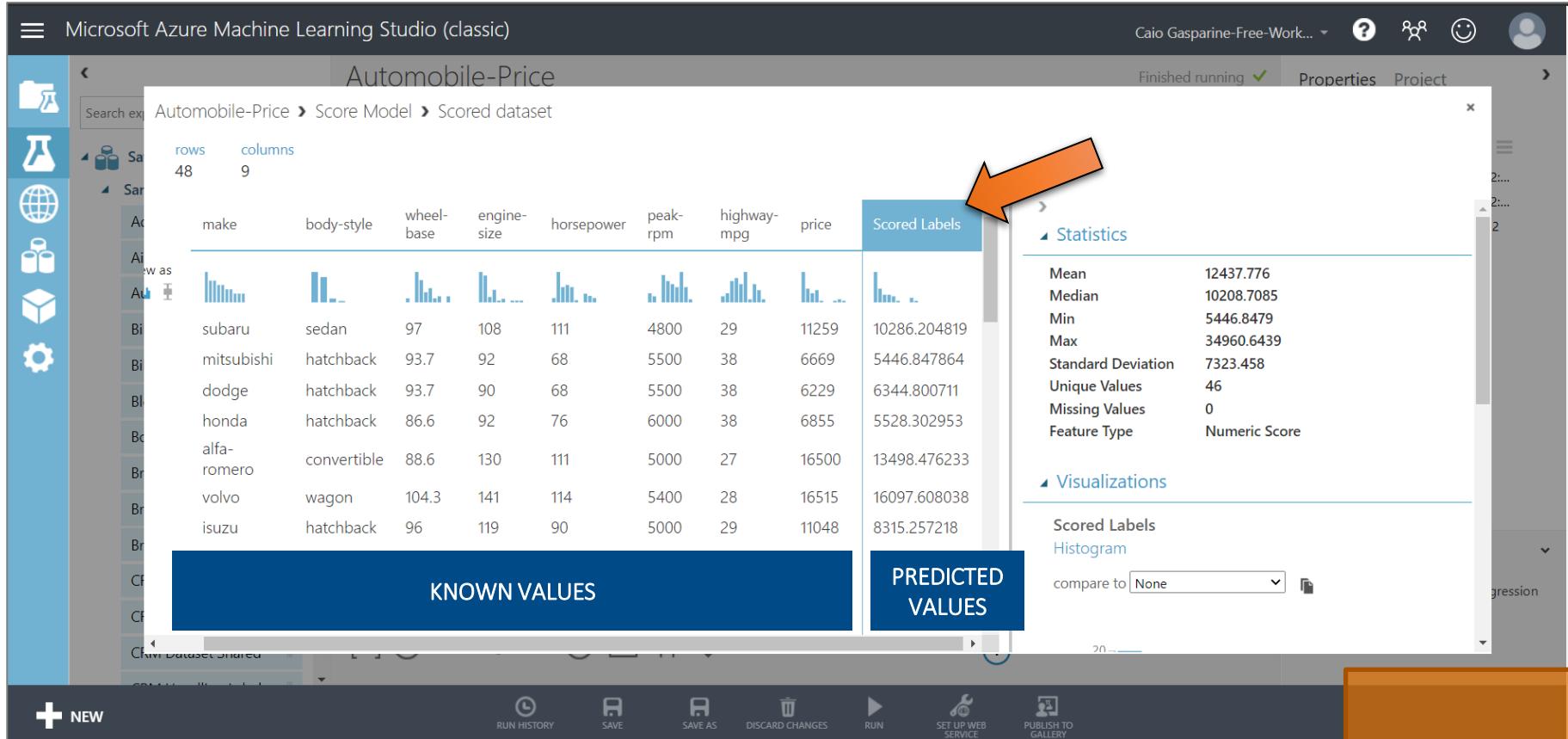
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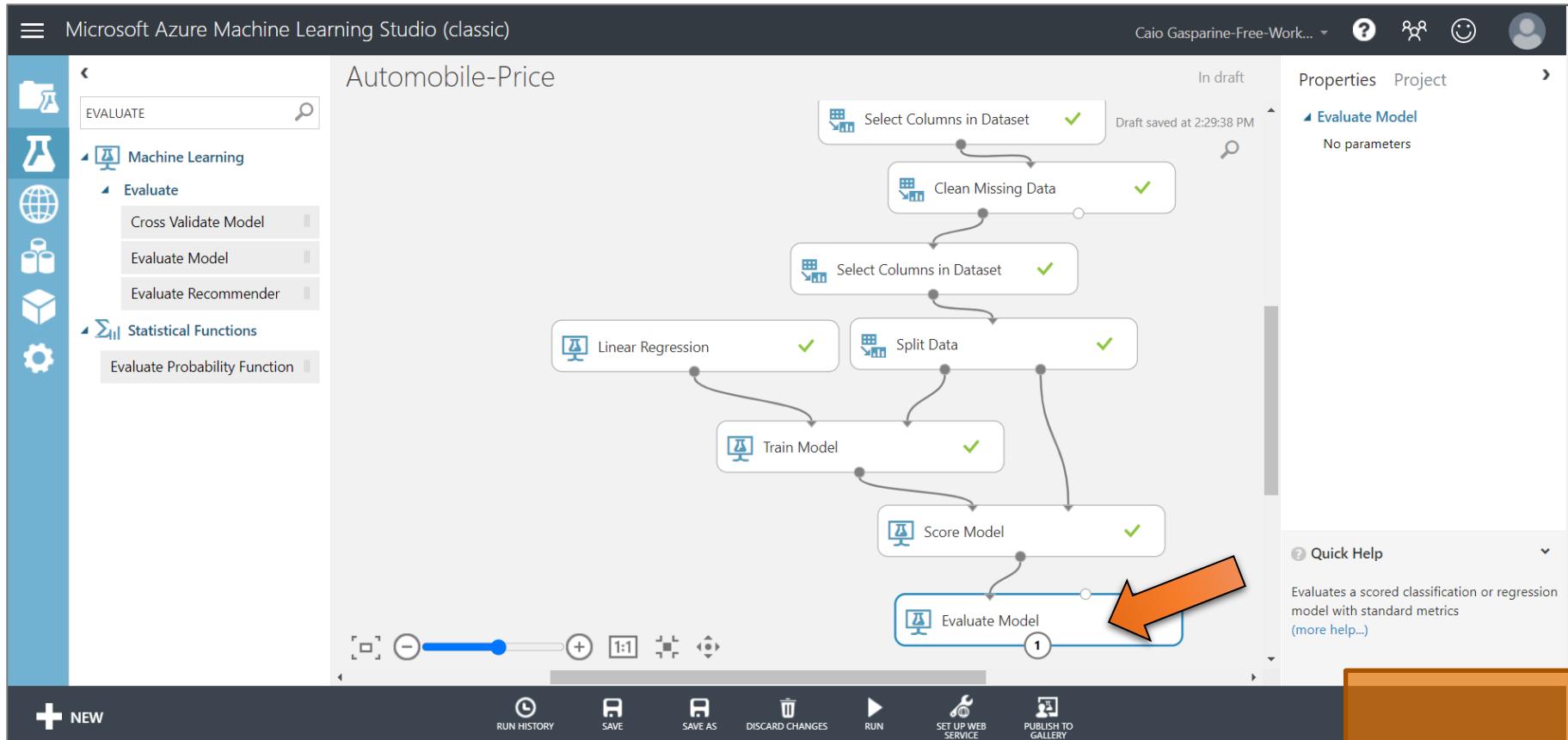
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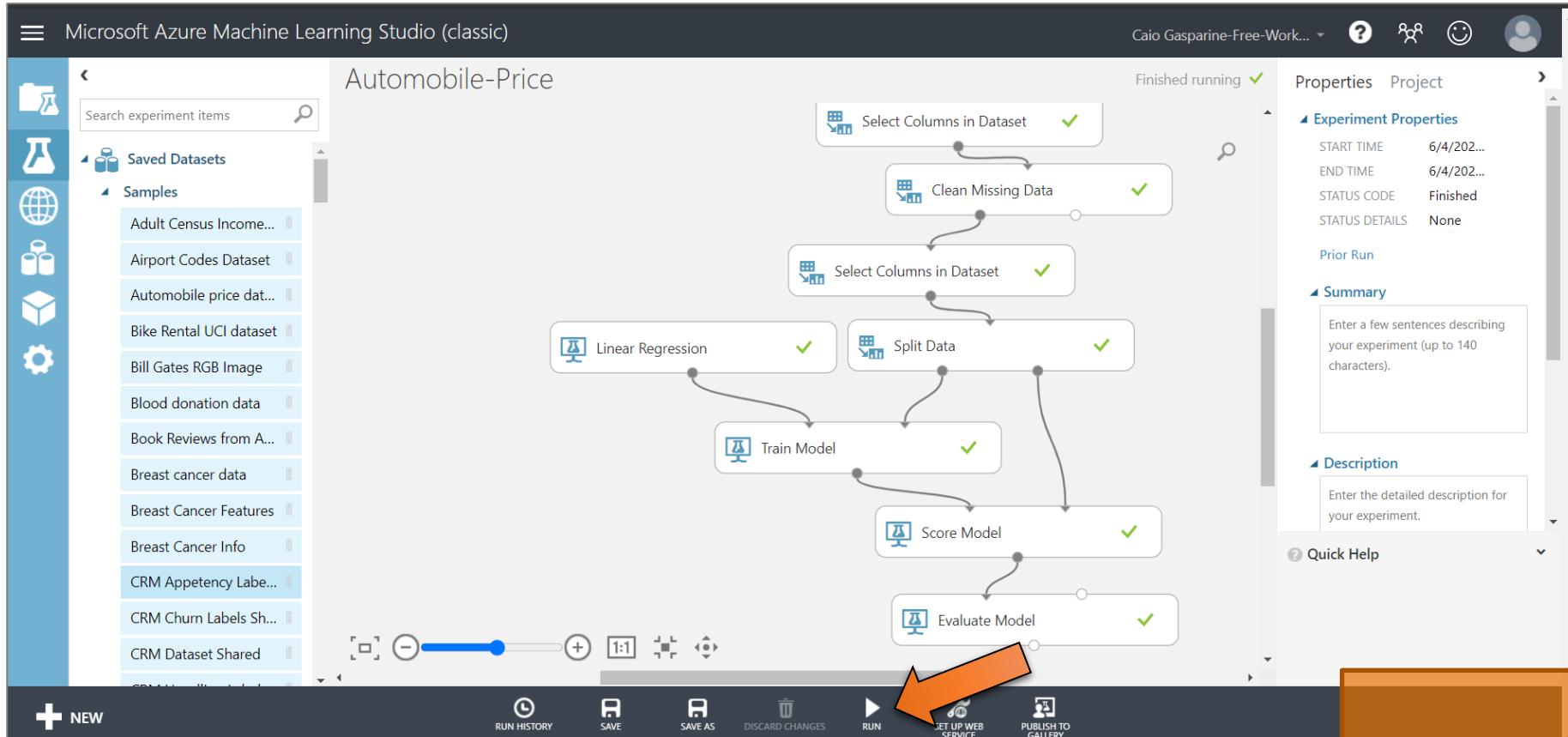
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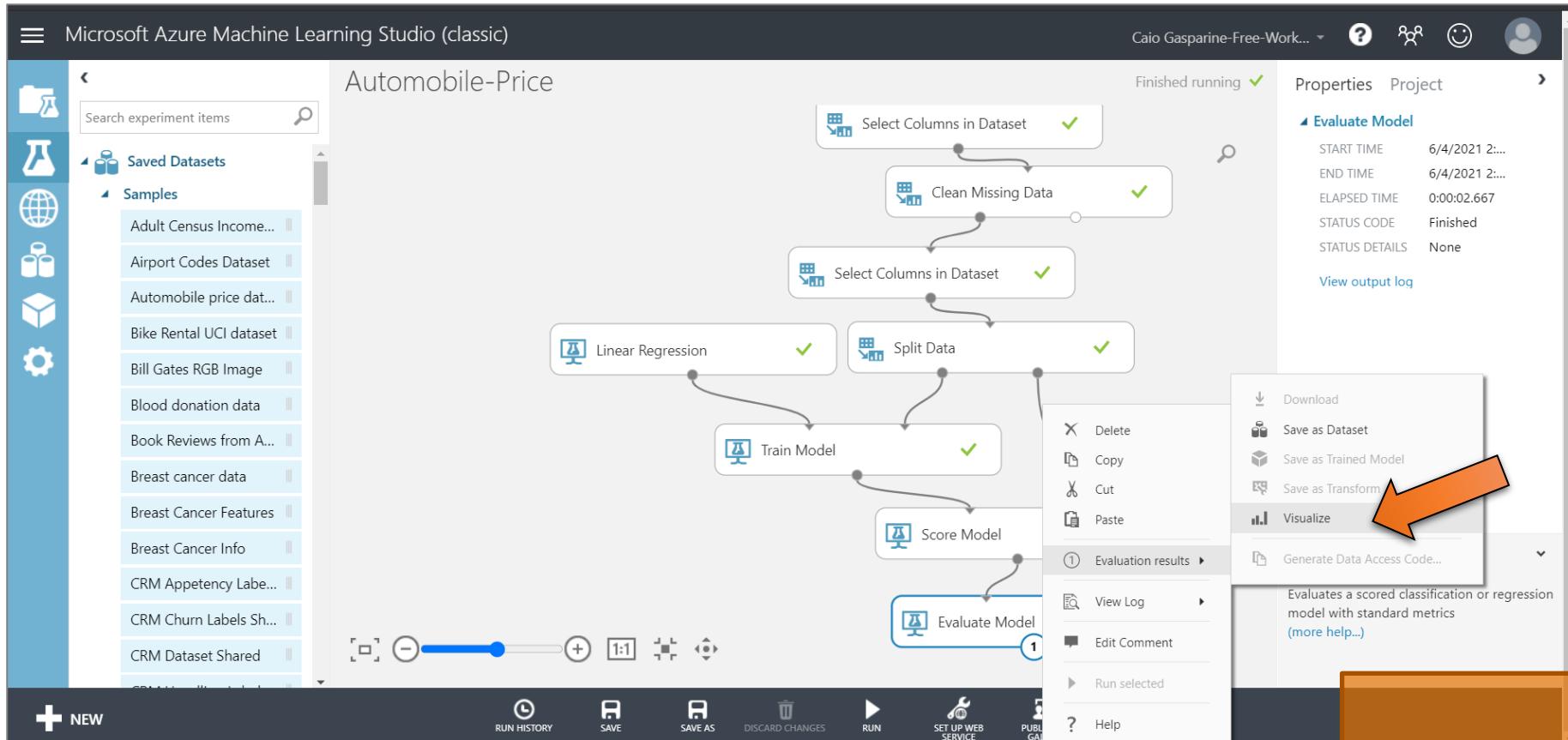
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# > Azure Machine Learning Studio | Practice

Microsoft Azure Machine Learning Studio (classic)

Automobile-Price > Evaluate Model > Evaluation results

Metrics

Mean Absolute Error	1656.147651
Root Mean Squared Error	2456.983209
Relative Absolute Error	0.276606
Relative Squared Error	0.089608
Coefficient of Determination	0.910392

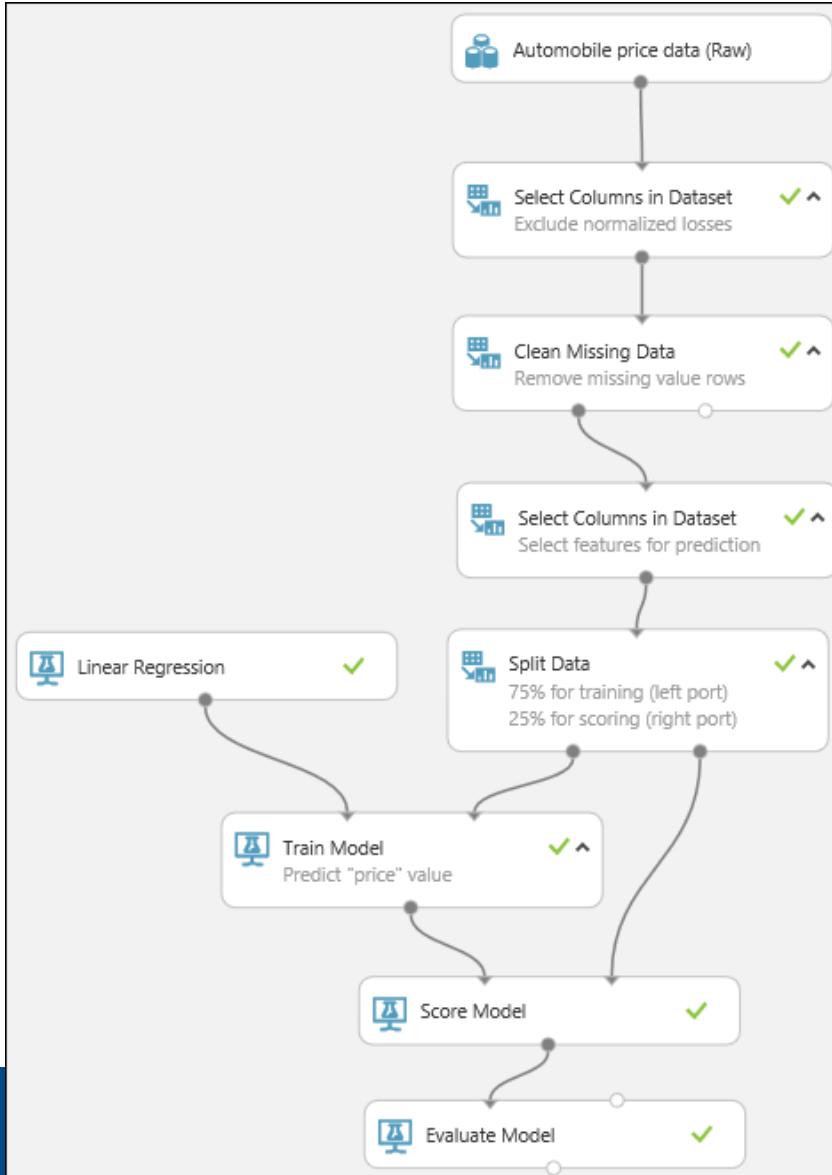
Error Histogram

This screenshot illustrates the evaluation results for a machine learning model in Azure Machine Learning Studio. The highlighted section details five key performance metrics:

- Mean Absolute Error (MAE):** The average of absolute errors (an *error* is the difference between the predicted value and the actual value).
- Root Mean Squared Error (RMSE):** The square root of the average of squared errors of predictions made on the test dataset.
- Relative Absolute Error:** The average of absolute errors relative to the absolute difference between actual values and the average of all actual values.
- Relative Squared Error:** The average of squared errors relative to the squared difference between the actual values and the average of all actual values.
- Coefficient of Determination:** Also known as the **R squared value**, this is a statistical metric indicating how well a model fits the data.

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academic purposes

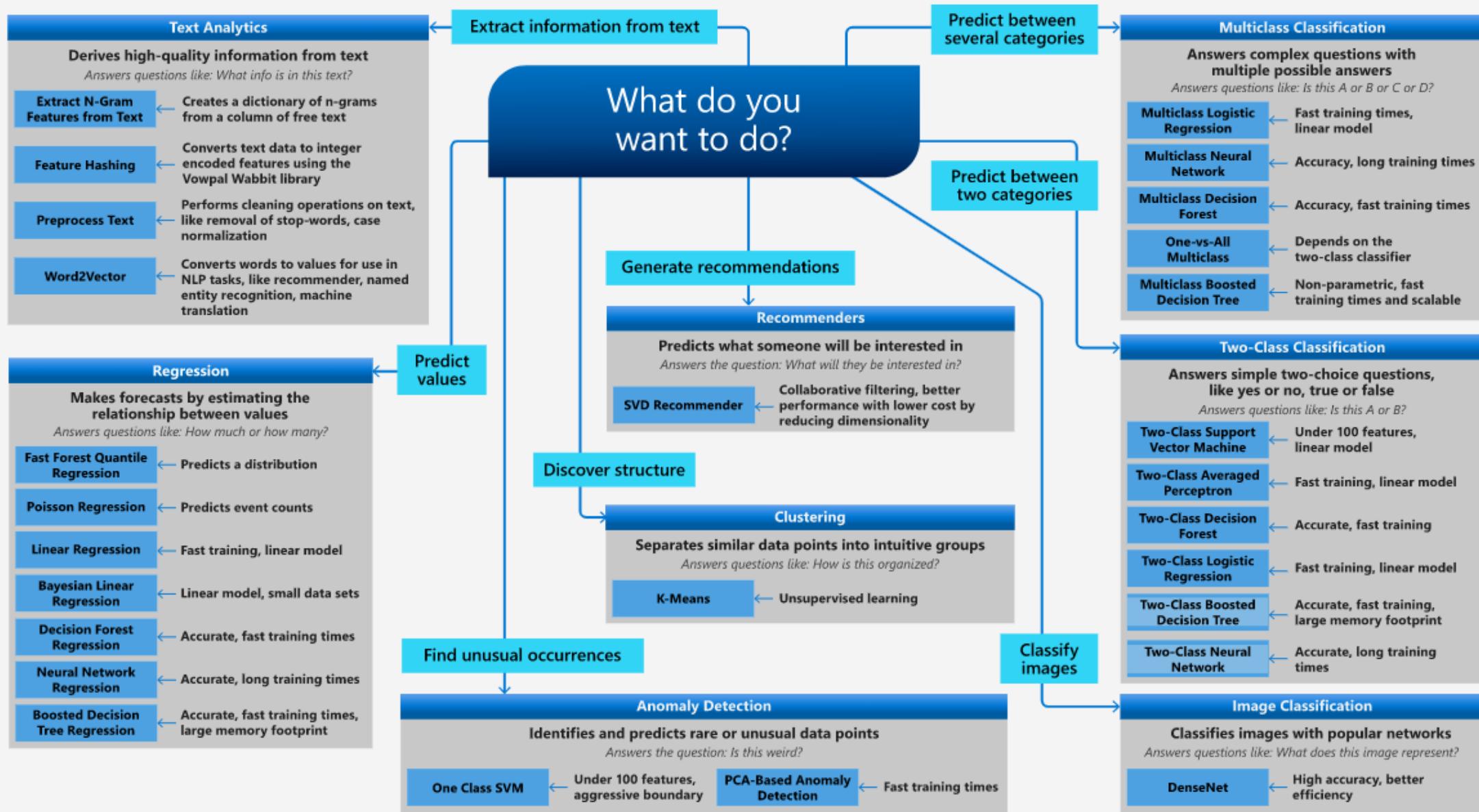
# > Azure Machine Learning Studio | Practice



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# Microsoft Azure Machine Learning Algorithm Cheat Sheet

This cheat sheet helps you choose the best machine learning algorithm for your predictive analytics solution. Your decision is driven by both the nature of your data and the goal you want to achieve with your data.



# Practice #2 / Part 2

## Azure Machine Learning Studio German Credit Data



Azure Machine Learning

# > #2 Azure Machine Learning Studio (Classic) / Part 2

## INSTRUCTIONS:

Record a video with 5-10 minutes explaining how to use **Azure Machine Learning Studio** and your discoveries.

- Follow each of the steps detailed in the Microsoft Tutorial and explain them.
- Explain that you are loading the file, select columns, cleaning missing data, splitting the file, etc.
- Explain why you are performing each step.
- Make your conclusion of the predicted values.
- Evaluate your model and explain the results.
- Analyze all the steps you performed and think how should be the behavior (processes) of an enterprise solution with the same purpose. What are the differences?

*In your video explain how and why you performed each step and explain the final result.*

## EVALUATION:

**Mark: 10 points (part 1 and 2)**

- Ensure that you recorded yourself using the tool or using your own screenshots
- Ensure that you recorded all the performed steps
- Ensure that you analysed the results
- Explain what kind of ML you are using in this exercise and why

Will be considered: Your results, explanations, level of details, clarity to explain and presentation / video quality (preparation).

**Due date: Week 6 class**

# > Azure Machine Learning Studio | Practice / Part 2

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## MAIN GOAL:

Develop a predictive analytics  
solution and deploy the model as an  
Azure Machine Learning web service.

### MAIN STEPS:

Create a predictive experiment

<https://docs.microsoft.com/en-us/azure/machine-learning/classic/tutorial-part1-credit-risk>

Train and evaluate

<https://docs.microsoft.com/en-us/azure/machine-learning/classic/tutorial-part2-credit-risk-train>

Deploy web service

<https://docs.microsoft.com/en-us/azure/machine-learning/classic/tutorial-part3-credit-risk-deploy>

# References



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- Towards Data, Understanding AUC - ROC Curve, website, <https://towardsdatascience.com/understanding-auc-roc-curve-68b2303cc9c5>



# Georgian

END OF DAY 5