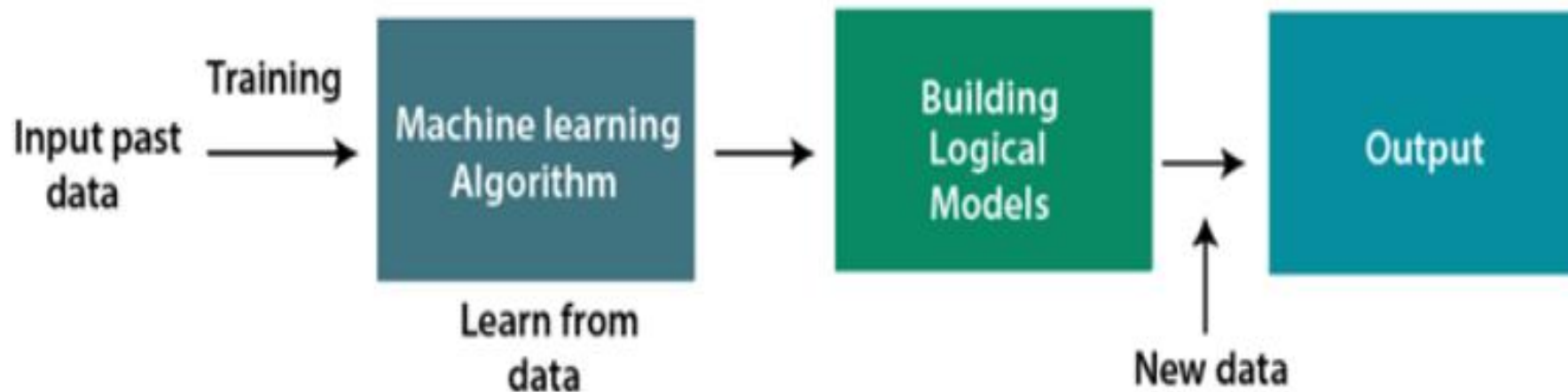


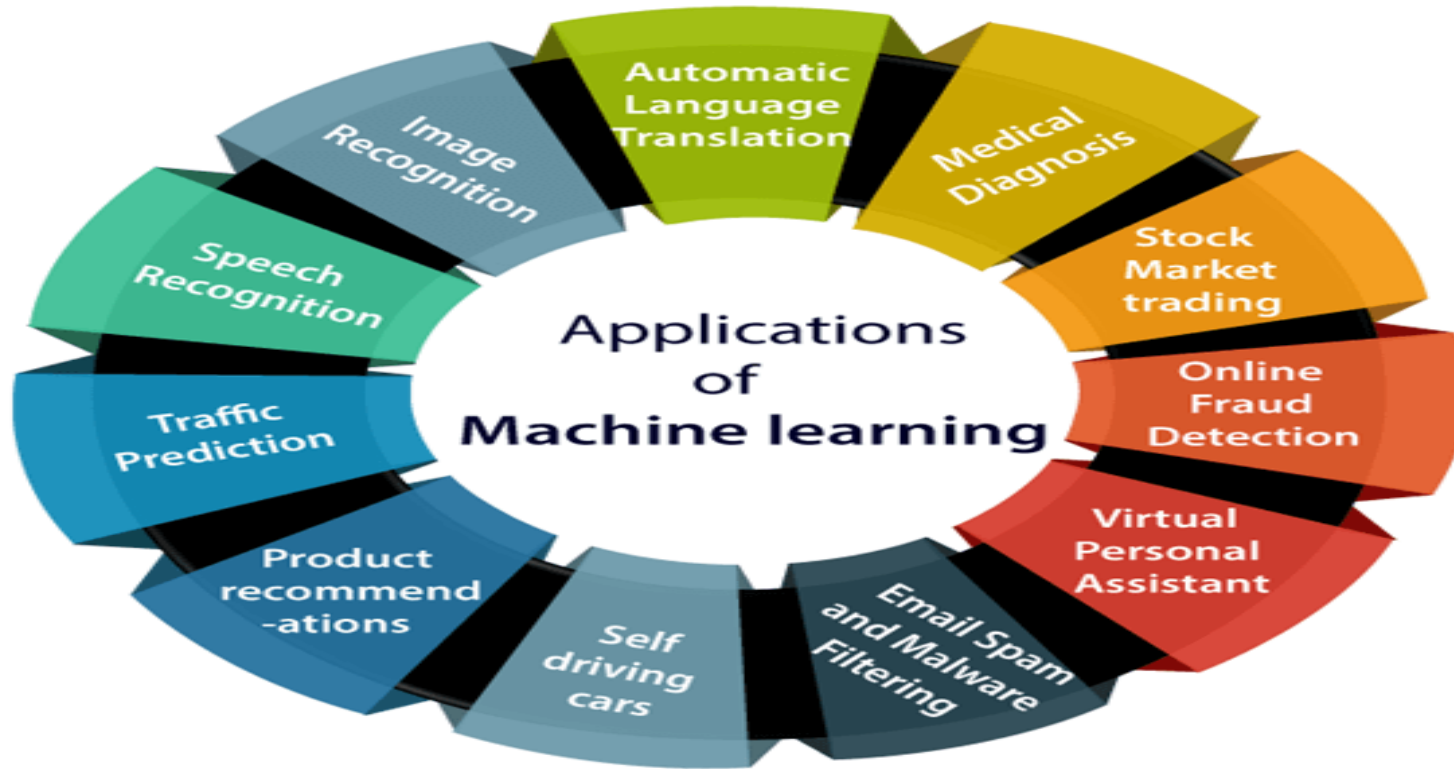
# MACHINE LEARNING

Machine Learning is the field of study that gives computers the capability to learn without being explicitly programmed.



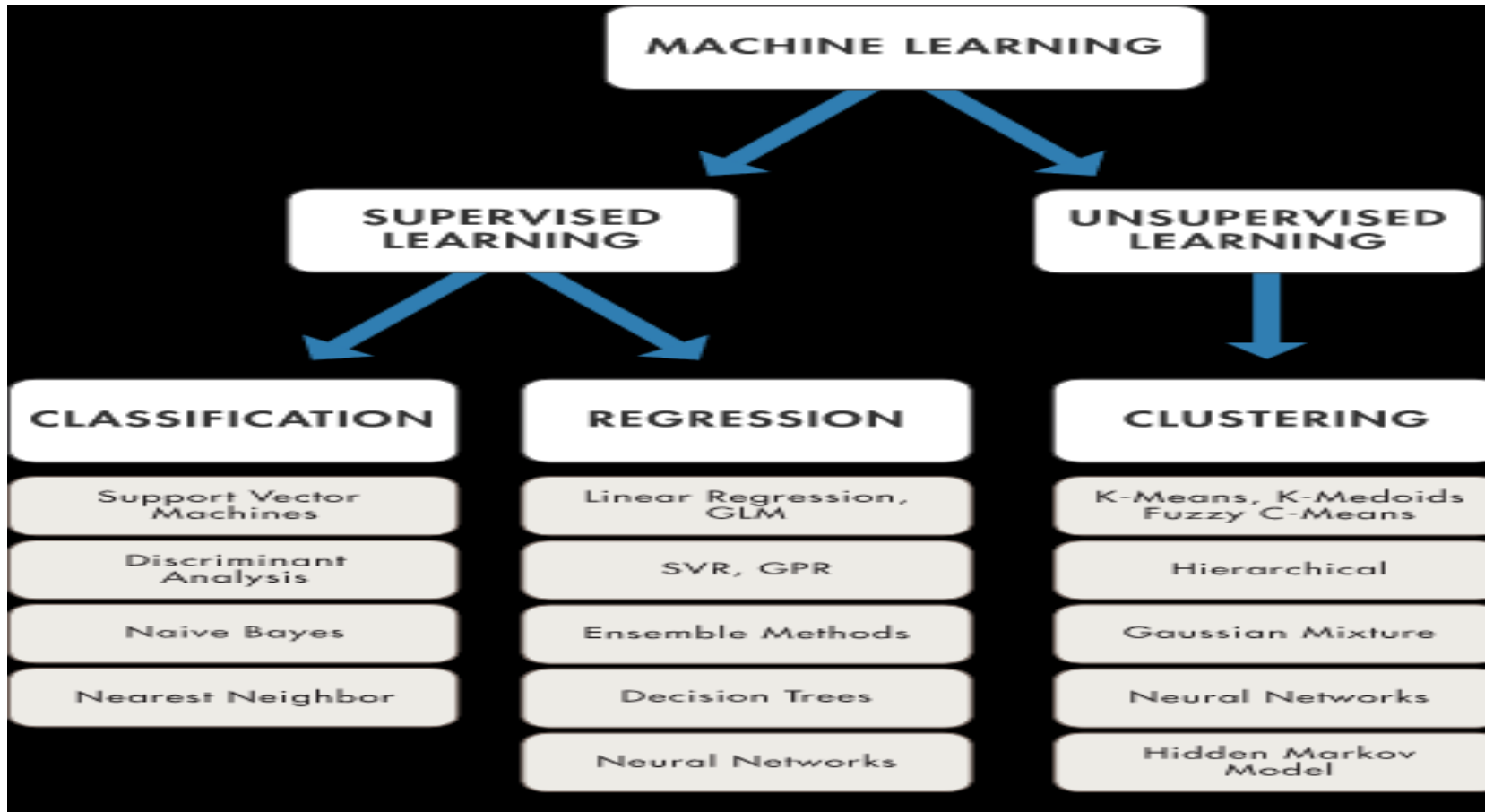
<https://static.javatpoint.com/tutorial/machine-learning/images/introduction-to-machine-learning2.png>

# Real time applications of ML



<https://www.javatpoint.com/applications-of-machine-learning>

# Techniques



<https://mobidev.biz/blog/5-essential-machine-learning-techniques>

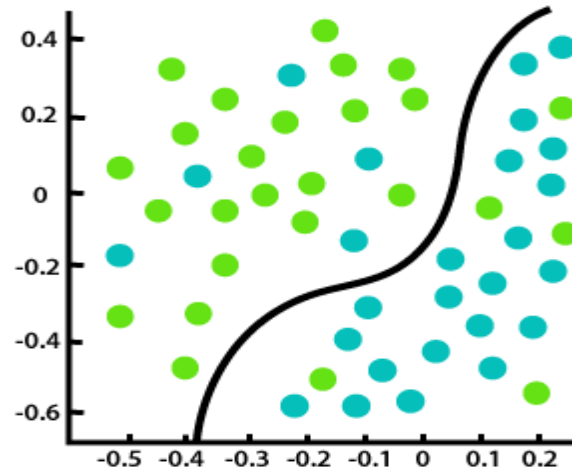
# Scikit Learn library



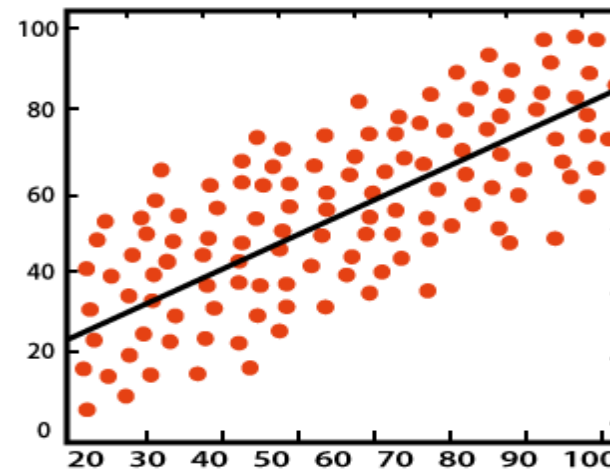
<https://towardsdatascience.com/best-python-libraries-for-machine-learning-and-deep-learning-b0bd40c7e8c>

# Regression vs Classification

- Regression algorithms are used to predict the continuous values.
- Classification algorithms are used to predict or Classify the discrete values.



Classification

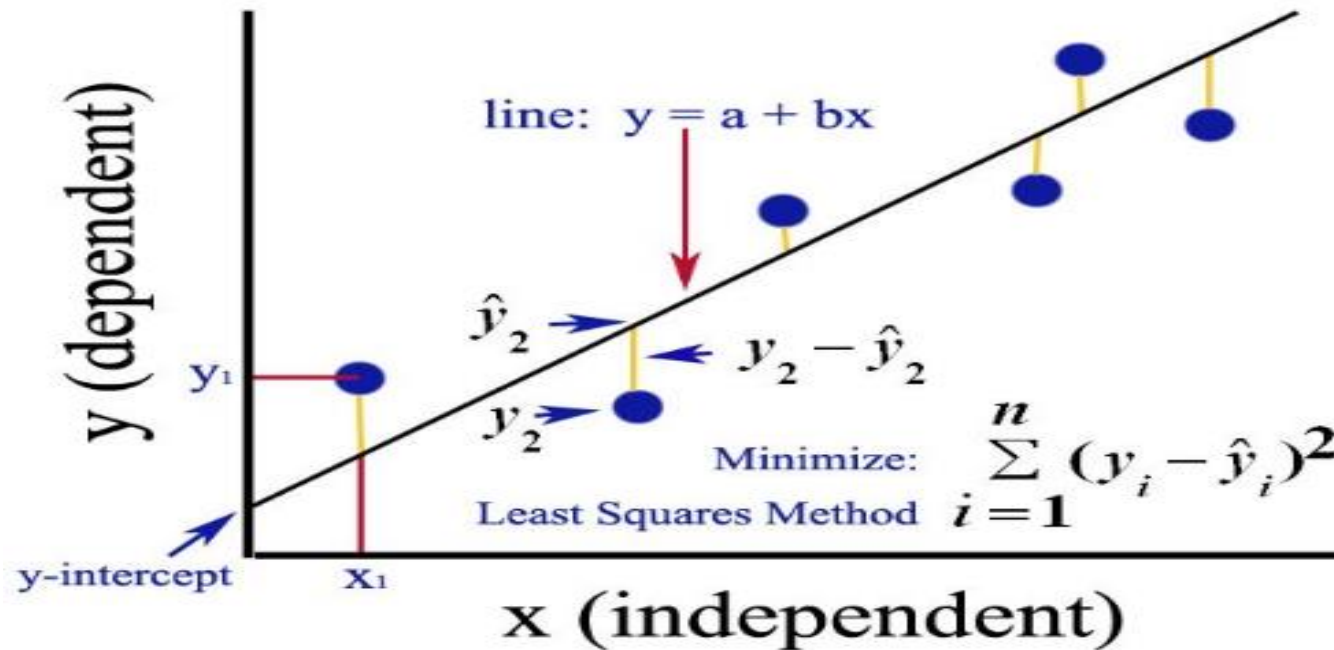


Regression

<https://www.javatpoint.com/regression-vs-classification-in-machine-learning>

# Least Square Method

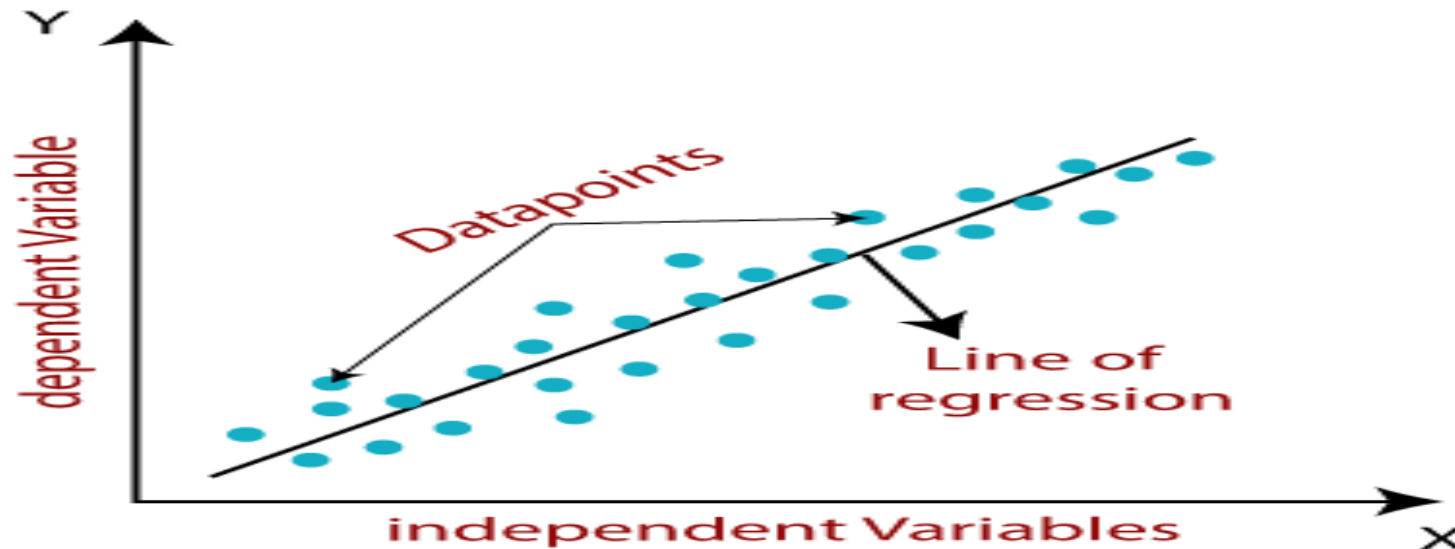
To find the best fit line that represents the relationship between an independent and dependent variable.



<https://medium.com/analytics-vidhya/ordinary-least-square-ols-method-for-linear-regression-ef8ca10aadfc>

# Linear Regression

It shows a linear relationship between a dependent (y) and one or more independent (x) variables.



<https://www.javatpoint.com/linear-regression-in-machine-learning>

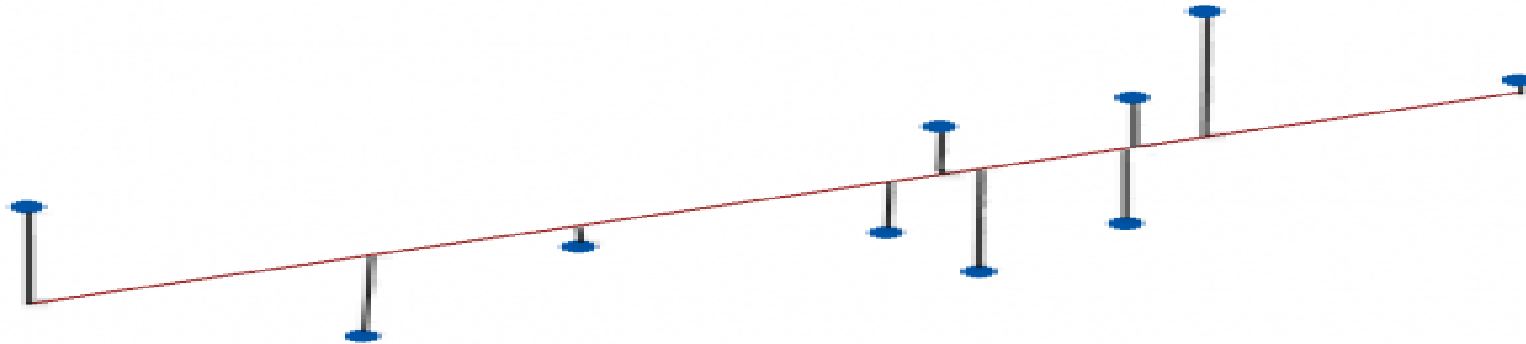
# Mathematical Intuition

- **Cost function:** It measures how a linear regression model is performing.
- **Gradient Descent:** To minimize the MSE by calculating the gradient of the cost function.
- **Model Performance:** Process of finding the best model out of various models.



# Ordinary Least Square Method

Estimates the parameters in a regression model by minimizing the sum of the squared residuals.



<https://statisticsbyjim.com/glossary/ordinary-least-squares/#:~:text=Ordinary%20least%20squares%2C%20or%20linear,and%20the%20corresponding%20fitted%20values>

# List of Popular Dataset Websites

1. Google's Datasets Search Engine  
<https://datasetsearch.research.google.com/>
2. Kaggle Datasets - <https://www.kaggle.com/datasets>
3. Data Government of India – <https://www.data.gov.in>
4. Earth Data - <https://earthdata.nasa.gov/>
5. Amazon and Microsoft Datasets, Azure and AWS  
<https://registry.opendata.aws/>  
<https://azure.microsoft.com/en-us/services/open-datasets/catalog/?q=>
6. Data World - <https://data.world/>
7. Lionbridge AI Datasets - <https://lionbridge.ai/datasets/>
8. UCI Machine Learning Repository -  
<https://archive.ics.uci.edu/ml/datasets.php>

# Linear Regression Implementation

- Import the Libraries

```
# importing the Linear Regression Model from Scikit Learn  
from sklearn.linear_model import LinearRegression
```

- Initialize our Linear Regression model

```
# initialize the Linear Regression model  
regression = LinearRegression()
```

- Fitting the Linear Regression Model

```
# fit the linear regression model  
regression.fit(X_train, y_train)
```

- Predict the test set Result

```
# Predict the Regression model  
y_pred = regression.predict(X_test)
```

# Linear Regression Evaluation Techniques

$$MAE = \frac{1}{N} \sum_{i=1}^N |y_i - \hat{y}|$$

$$MSE = \frac{1}{N} \sum_{i=1}^N (y_i - \hat{y})^2$$

Where,

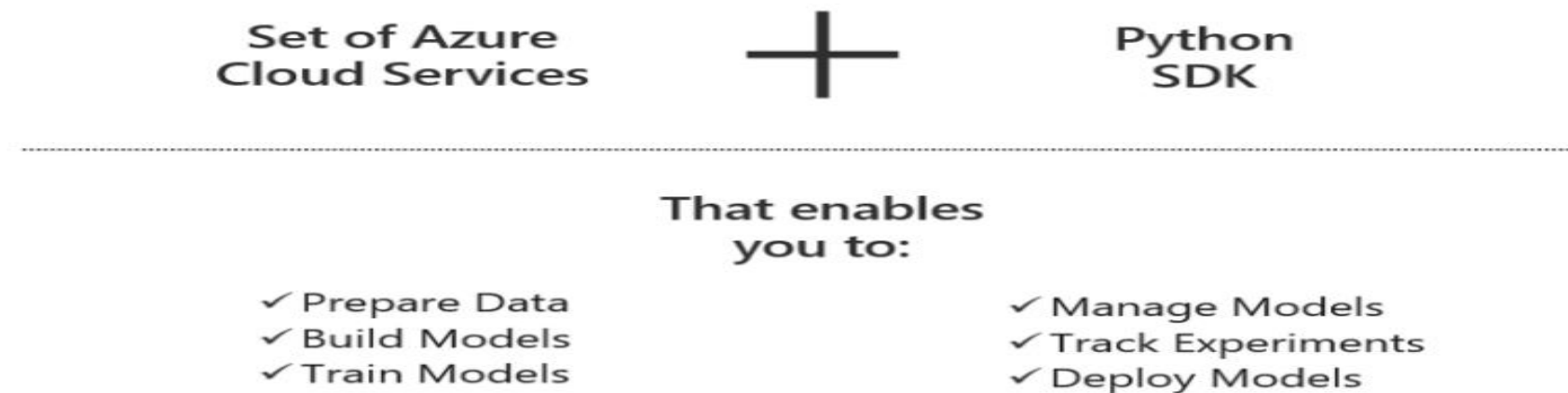
$\hat{y}$  – predicted value of  $y$

$\bar{y}$  – mean value of  $y$

<https://www.datatechnotes.com/2019/02/regression-model-accuracy-mae-mse-rmse.html>

# Azure ML No Code Platform

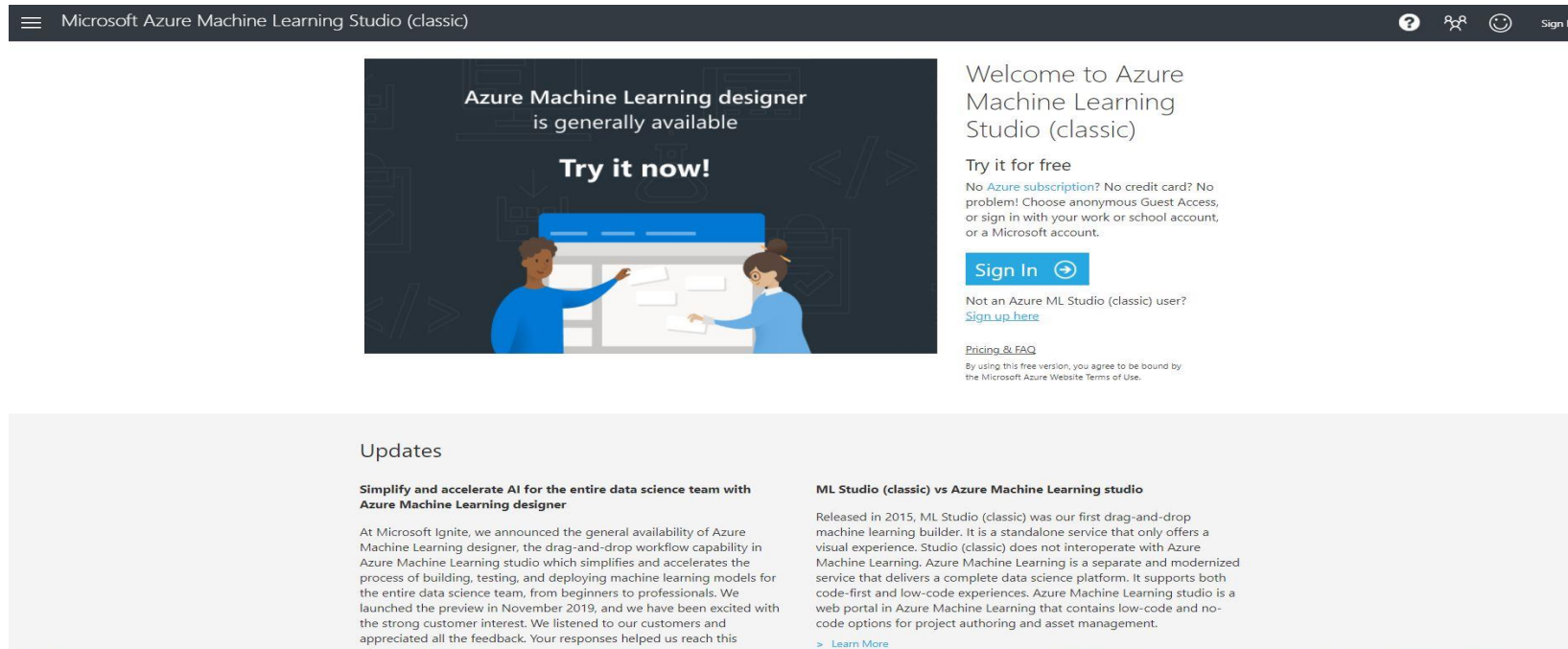
A cloud service that allows building no-code machine learning models through a drag and drop visual interface.



[https://docs.microsoft.com/en-us/azure/machine-learning/overview-what-is-azure-ml?WT.mc\\_id=aiml-0000-abornst](https://docs.microsoft.com/en-us/azure/machine-learning/overview-what-is-azure-ml?WT.mc_id=aiml-0000-abornst)

# Azure ML Studio Briefing

Web-based integrated development environment (IDE) for developing data experiments.



The screenshot shows the Azure Machine Learning Studio (classic) homepage. The header bar is dark grey with a hamburger menu icon, the text "Microsoft Azure Machine Learning Studio (classic)", and icons for help, user profile, and a "Sign In" button. The main content area features a large dark blue banner on the left with the text "Azure Machine Learning designer is generally available" and "Try it now!" above an illustration of two people working on a screen. To the right of the banner, the text "Welcome to Azure Machine Learning Studio (classic)" is displayed, followed by "Try it for free" and a paragraph explaining that no Azure subscription or credit card is needed, and that users can choose anonymous Guest Access, sign in with a work or school account, or a Microsoft account. A blue "Sign In" button with a right arrow is present. Below this, a link "Sign up here" is provided for non-users. At the bottom of the main content area, a link "Pricing & FAQ" is shown, followed by a small disclaimer: "By using this free version, you agree to be bound by the Microsoft Azure Website Terms of Use." Below the main content area, there is a section titled "Updates" with two columns. The left column is titled "Simplify and accelerate AI for the entire data science team with Azure Machine Learning designer" and contains a paragraph about the general availability of Azure Machine Learning designer at Microsoft Ignite, mentioning its drag-and-drop workflow capability and its launch in November 2019. The right column is titled "ML Studio (classic) vs Azure Machine Learning studio" and contains a paragraph explaining that ML Studio (classic) was released in 2015 as a standalone service, while Azure Machine Learning studio is a more modernized service that supports both code-first and low-code experiences. A link "> Learn More" is at the bottom of the right column.

Microsoft Azure Machine Learning Studio (classic)

?

Sign In

Azure Machine Learning designer is generally available

Try it now!

Welcome to Azure Machine Learning Studio (classic)

Try it for free

No Azure subscription? No credit card? No problem! Choose anonymous Guest Access, or sign in with your work or school account, or a Microsoft account.

Sign In

Not an Azure ML Studio (classic) user? [Sign up here](#)

Pricing & FAQ

By using this free version, you agree to be bound by the Microsoft Azure Website Terms of Use.

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 Azure Machine Learning studio which simplifies and accelerates the process of building, testing, and deploying machine learning models for the entire data science team, from beginners to professionals. We launched the preview in November 2019, and we have been excited with the strong customer interest. We listened to our customers and appreciated all the feedback. Your responses helped us reach this milestone. Thank you.

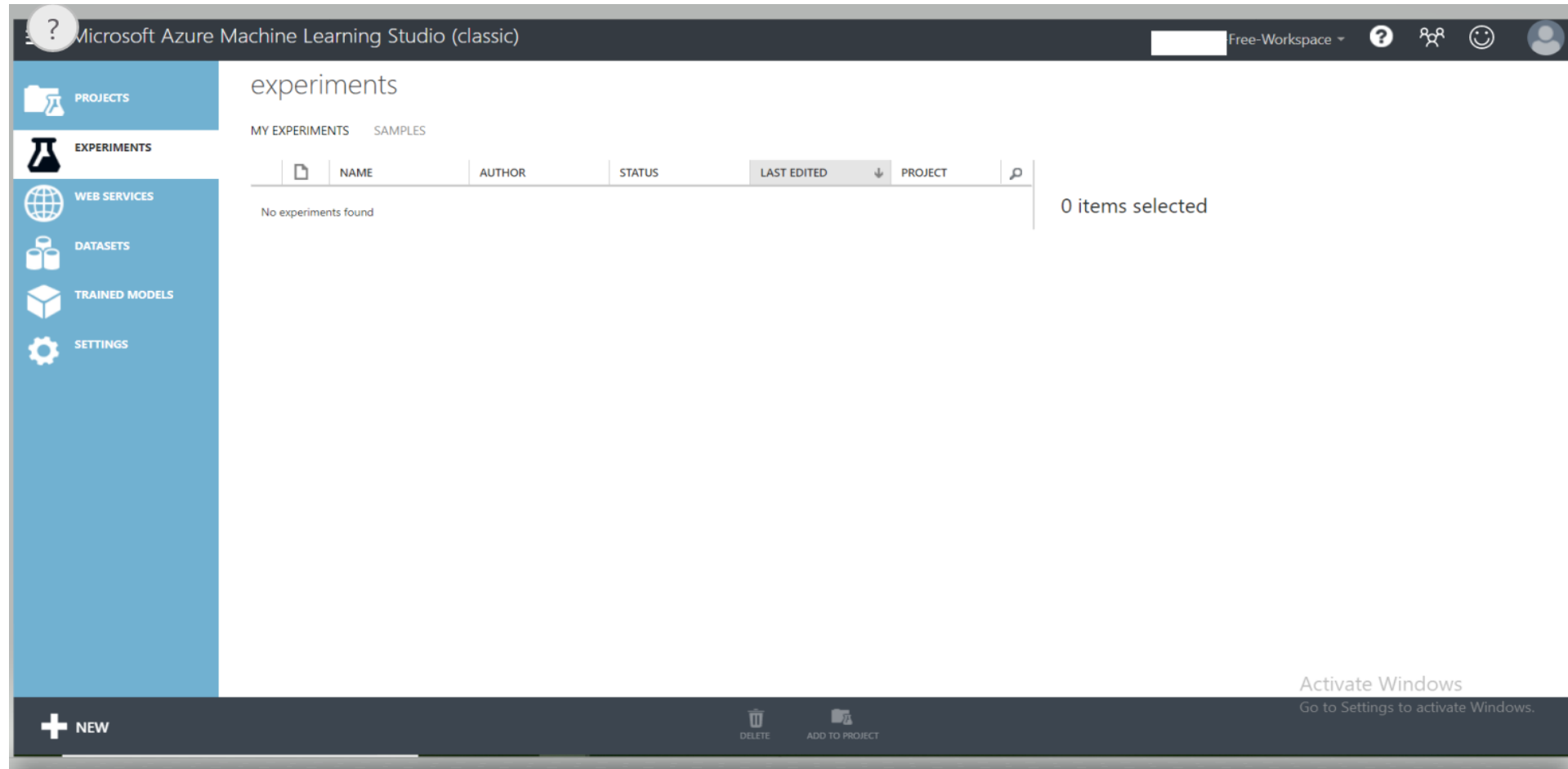
**ML Studio (classic) vs Azure Machine Learning studio**

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 Machine Learning. Azure Machine Learning is a separate and modernized service that delivers a complete data science platform. It supports both code-first and low-code experiences. Azure Machine Learning studio is a web portal in Azure Machine Learning that contains low-code and no-code options for project authoring and asset management.

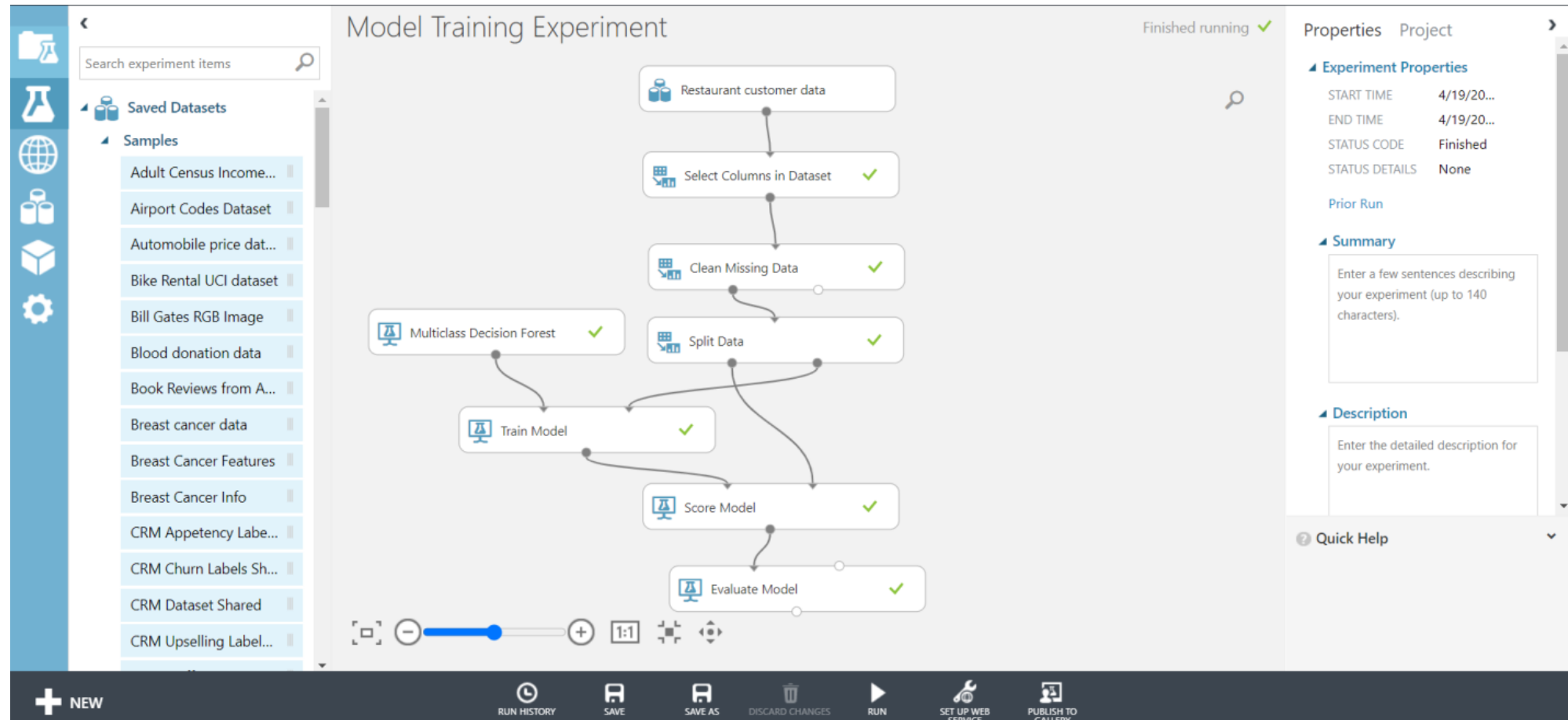
> [Learn More](#)

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

# Microsoft Azure workspace

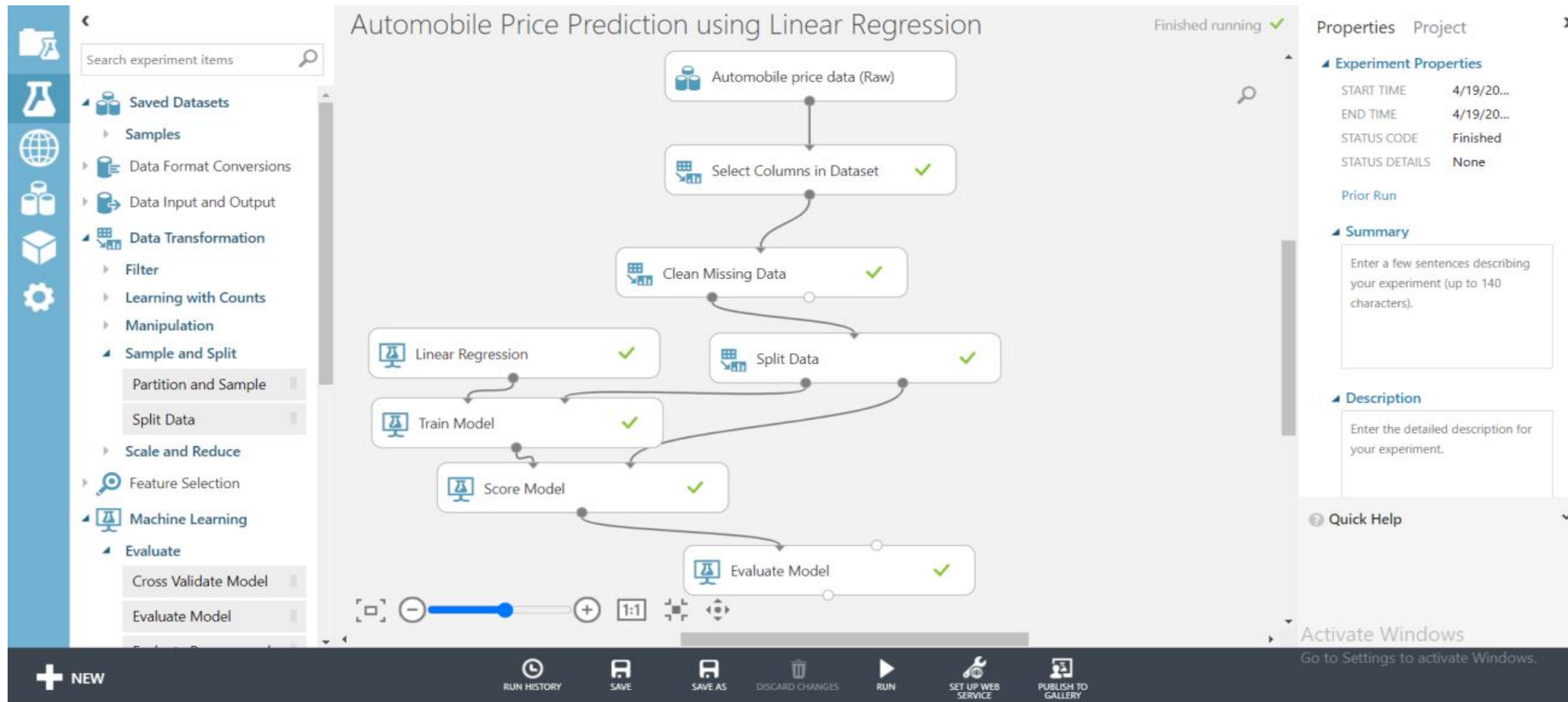


# Training a ML model



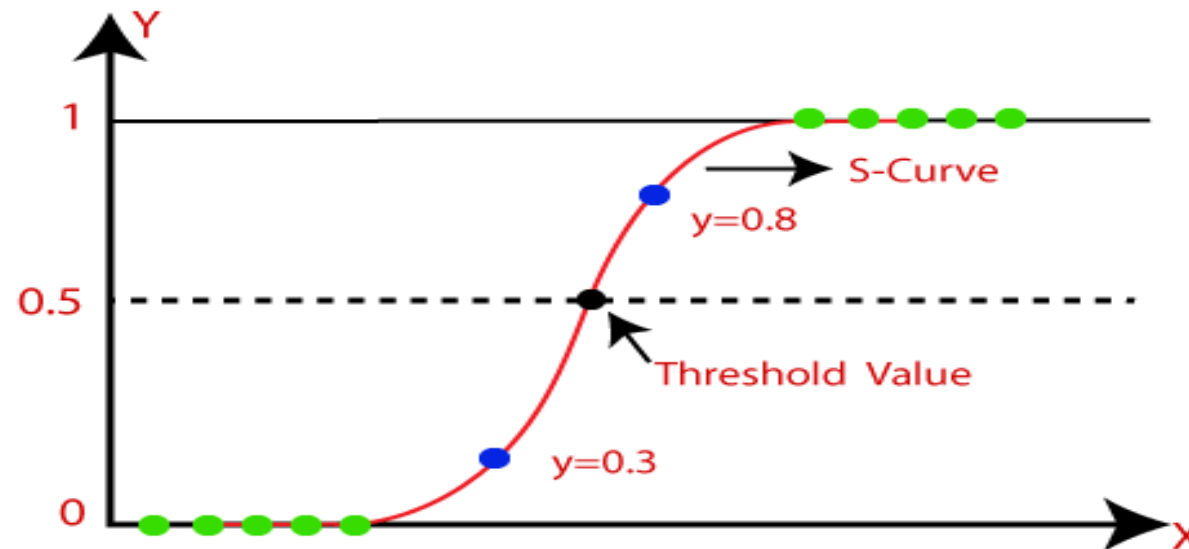


# Regression model with Azure ML Studio



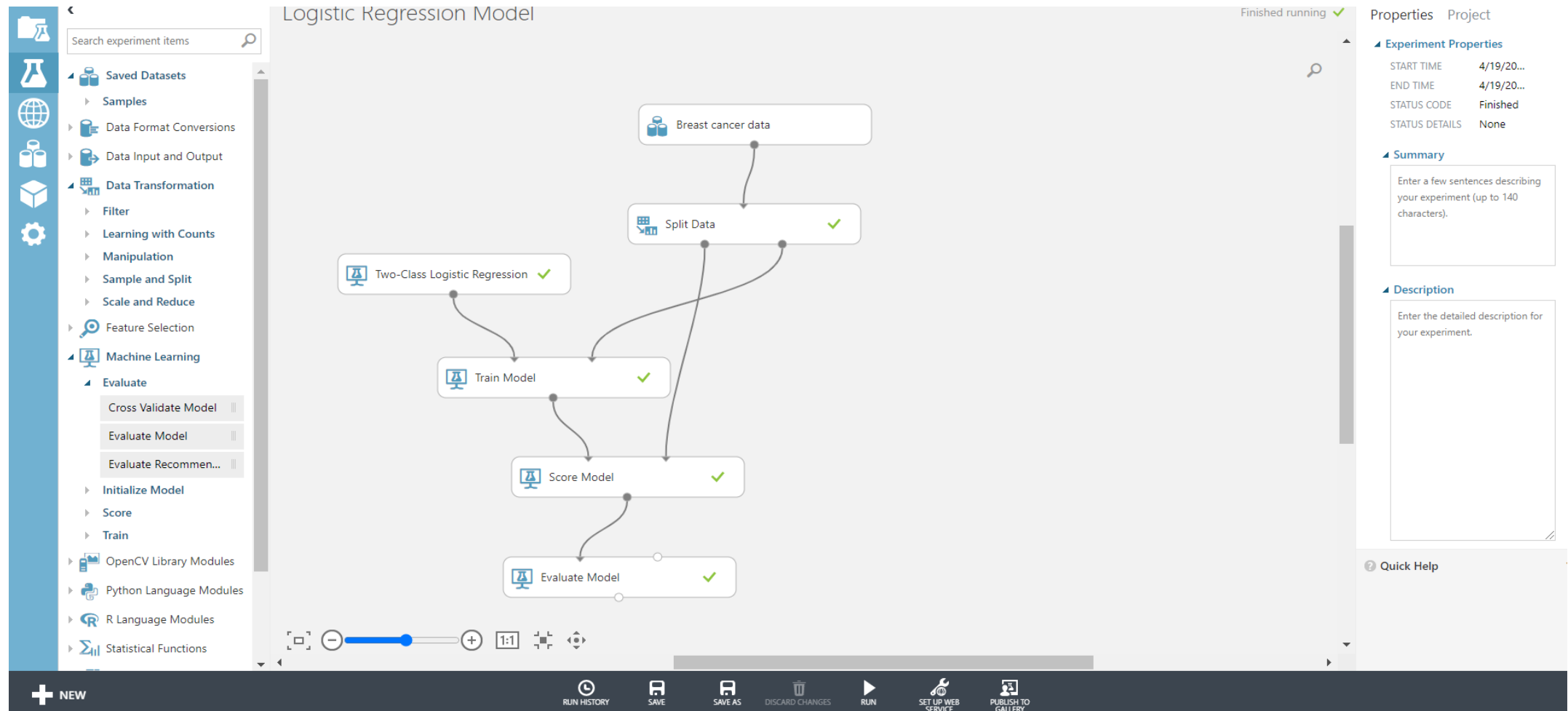
# Logistic Regression

- Supervised Learning technique.
- Predict the categorical dependent variable using a given set of independent variables.



<https://www.javatpoint.com/logistic-regression-in-machine-learning>

# Logistic Regression model with ML Studio



# REFERENCES

1. <https://www.geeksforgeeks.org/machine-learning/>
2. <https://www.javatpoint.com/regression-vs-classification-in-machine-learning>
3. <https://www.javatpoint.com/linear-regression-in-machine-learning>
4. <https://medium.com/analytics-vidhya/role-of-distance-metrics-in-machine-learning-e43391a6bf2e>
5. <https://www.datasciencecentral.com/profiles/blogs/understanding-the-applications-of-probability-in-machine-learning>

# THANK YOU