



Business Problem

"Auto insurance fraud ranges from misrepresenting facts on insurance applications and inflating insurance claims to staging accidents and submitting claim forms for injuries or damage that never occurred, to false reports of stolen vehicles. Fraud accounted for between 15 percent and 17 percent of total claims payments for auto insurance bodily injury in 2012, according to an Insurance Research Council (IRC) study. The study estimated that between 5.6 billion and 7.7 billion was fraudulently added to paid claims for auto insurance bodily injury payments in 2012, compared with a range of 4.3 billion to 5.8 billion in 2002. " source: Insurance Information Institute

In this example, we will use an auto insurance domain to detect claims that are possibly fraudulent.

We will try to implement all of this using just the sagemaker tools

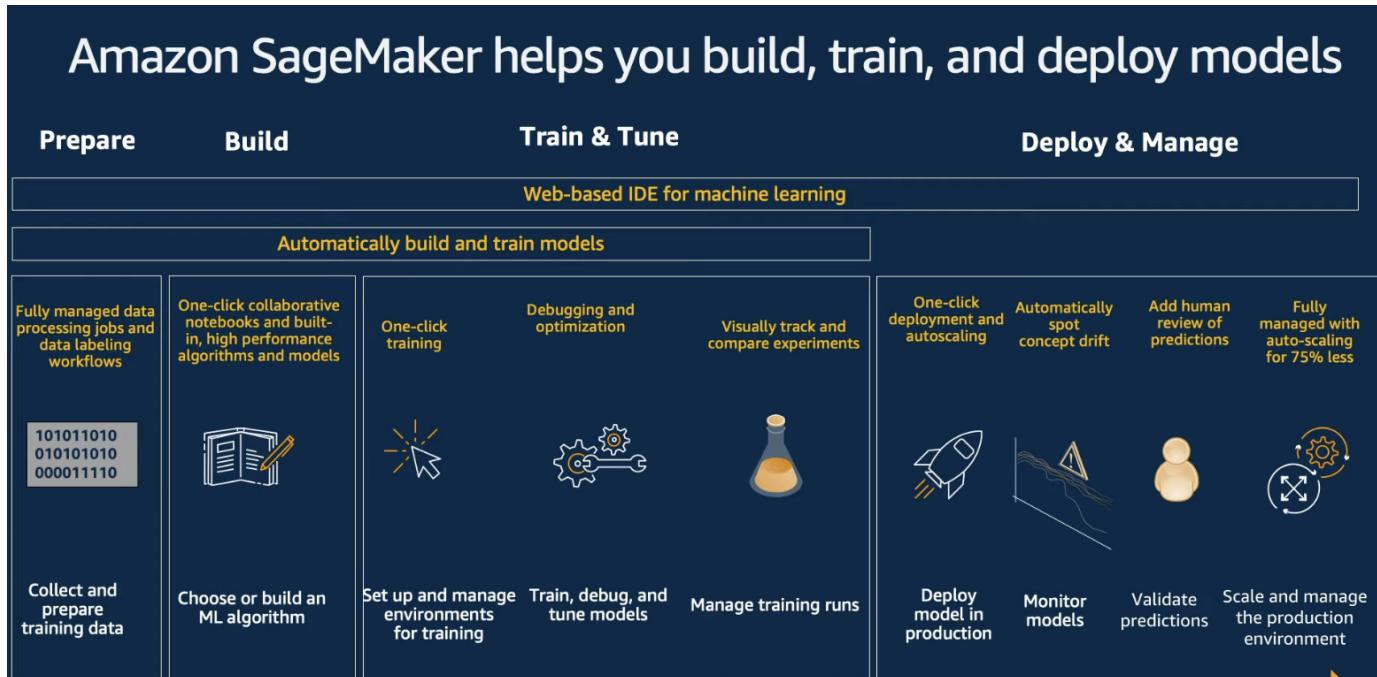
▼ Amazon SageMaker



▼ What is Amazon SageMaker?

Amazon SageMaker is a managed service in the Amazon Web Services (AWS) public cloud. It is a fully-managed service that enables data scientists and developers to quickly and easily build, train, and deploy machine learning models at any scale. Amazon SageMaker includes modules that can be used together or independently to build, train, and deploy your machine learning models.

It has made machine learning more accessible, allowed models to be created and run at scale, reduced training time, and led to standardized MLOps practices in many organizations.



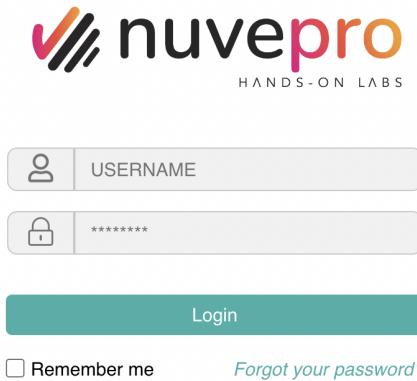
Machine learning in AWS SageMaker

gives users complete access, control, and visibility into each step required to build, train, and deploy models. The data can be uploaded, new notebooks can be created, training and tuning of models, moving back and forth between steps to adjust experiments, comparing results, and further deploying the models to production all in one place and finally making users productive. All the Machine Learning development activities including the notebooks, experiment management, automatic model creation, debugging, and model and data drift detection can be usually performed within SageMaker Studio.

- just like colab with environments pre-configured, Sagemaker provides notebooks running on systems from 2 core and 4GB machines all the way to 96 core and 768GB RAM machines to choose from
- integrates well with other aws services like S3, Data wrangler, Feature stores etc that we are going to learn more about
- SageMaker comes with Amazon's high-performing pre-trained models algorithms that can be leveraged to train your model.
- can create hyper parameter tuning jobs so that your model can tune overnight and you will be shown the best hyper parameters in the morning.
- Host the ML model in an endpoint – you can then call this endpoint from any other code written in any languages.

▼ Getting started

<https://poc.nuvepro.io/login/index.php>



Nuvepro provides pre-configured aws labs

- log on to the above link and click on start lab
- it will take a moment to prepare the labs for you
- click on jump to console and then access lab
- it will open up the AWS console you can work on
- this is the same AWS window with all the features up and running

A screenshot of the AWS Console Home page. At the top, there's a navigation bar with the AWS logo, 'Services', a search bar ('Search for services, features, blogs, docs, and more'), and account information ('Mumbai' and 'customerpocscaleraawslabtest @ 1895-5185-6594'). Below the navigation is a section titled 'Console Home' with a 'Info' link. It includes buttons for 'Reset to default layout' and '+ Add widgets'. A 'Recently visited' section lists various AWS services with their icons: Amazon SageMaker, AWS Budgets, EC2, IAM Identity Center (successor to AWS Single ...), CodePipeline, Athena, CodeCommit, CloudShell, S3, Elastic Container Registry, IAM, and CloudTrail. At the bottom of this section is a 'View all services' link.

if you have Amazon sagemaker in the tab click on it

- or search for sagemaker in the search box above
- the search box can be easily used to navigate between different aws services
- you will be directed to the following screen
- click on get started



Get started

Quick start
Let Amazon SageMaker handle configuring account and setting the permissions that you or a team in your organization need to use Amazon SageMaker Studio. Choosing this option uses standard encryption, which you can't change. If you need more control over configuration, choose Standard setup.

User name

The user name can have up to 63 characters. Valid characters: A-Z, a-z, 0-9, and - (hyphen)

Execution role
Amazon SageMaker Studio requires permissions to access other AWS services, such as Amazon SageMaker and Amazon S3. The execution role must have the [AmazonSageMakerFullAccess policy](#) attached. If you don't have a role with this policy attached, we can create one for you.

Standard setup
Control all aspects of account configuration, including permissions and encryption. Choose this option if you are an administrator setting up Amazon SageMaker Studio for your organization.

- In the Amazon SageMaker navigation pane, choose Amazon SageMaker Studio.
- launch sagemaker studio
- In the Get started box, choose Quick start and specify a user name.
- For Execution role, choose Create an IAM role.
 - In the dialog box that appears, choose Any S3 bucket (Allow users that have access to your notebook instance access to any bucket and its contents in your account.) and choose Create role. Amazon SageMaker creates a role with the required permissions and assigns it to your instance.
- Click Submit.
- it will take a few minutes to setup

The screenshot shows the SageMaker Studio Control Panel. On the left, the 'Users' section displays a table with one row: 'default-1666126430761'. The table has columns for Name, Modified on, and Created on. The 'Launch app' button is visible. On the right, the 'Domain' section shows 'Status: Ready' and 'Authentication method: AWS Identity and Access Management (IAM)'.

- you should see the changes reflect in the control panel after the configuration is complete
 - if not, try refreshing the page after a few minutes
- In the Amazon SageMaker Studio Control Panel, choose launch app/Open Studio.

Data

The inputs for building our model and workflow are two tables of insurance data: a claims table and a customers table.

<https://drive.google.com/file/d/1TPk2KuuNtcFoYfRQJkYrniKRaa4CRQrN/view?usp=sharing>

<https://drive.google.com/file/d/1e57cKksN3S0fcLFDTOTVpoMueewAHJuR/view?usp=sharing>

- where do we have our data

before we start working on the model we need to get our data. we'll store the data in aws S3

Amazon S3

Amazon Simple Storage Service (Amazon S3) is a scalable, high-speed, web-based cloud storage service. The service is designed for online backup and archiving of data and applications on Amazon Web Services (AWS).

The S3 object storage cloud service gives a subscriber access to the same systems that Amazon uses to run its own websites. S3 enables customers to upload, store and download practically any file or object that is up to 5 terabytes (TB) in size

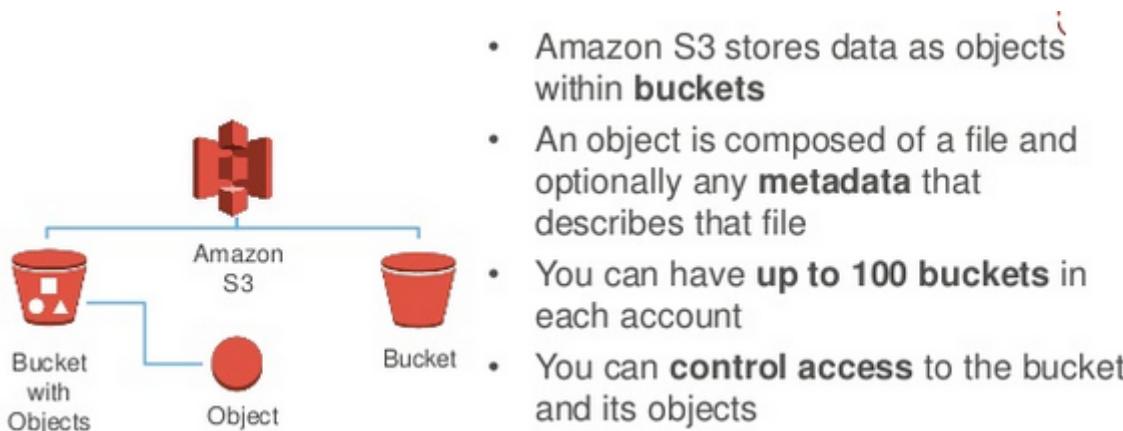
▼ AWS S3 Benefits

- Durability: S3 provides 99.999999999 percent durability.
- Low cost: S3 lets you store data in a range of “storage classes.” These classes are based on the frequency and immediacy you require in accessing files.

- Scalability: S3 charges you only for what resources you actually use. You can scale your storage resources to easily meet your organization's ever-changing demands.
- Availability: S3 offers 99.99 percent availability of objects
- Security: S3 offers an impressive range of access management tools and encryption features that provide top-notch security.
- Flexibility: S3 is ideal for a wide range of uses like data storage, data backup, software delivery, data archiving, disaster recovery, website hosting, mobile applications, IoT devices, and much more.
- Simple data transfer: The service revolves around simplicity and ease of use. These are compelling reasons to sign up for S3.

s3 stores data in the form of objects inside a bucket

An object consists of data, key (assigned name), and metadata. A bucket is used to store objects. When data is added to a bucket, Amazon S3 creates a unique version ID and allocates it to the object.



for uploading the data search for s3 in the search tab

- open s3 console and then if you have configured the sagemaker studio you will see that we already have a bucket created for us
- if not you can create a new bucket
 - Click Create Bucket.
 - In the Bucket Name box of the Create a Bucket dialog box, type a bucket name.
 - Select a Region. Create the bucket in the same Region as your cluster. If your cluster is in the US West (Oregon) Region, choose US West (Oregon) Region (us-west-2).
 - Choose Create.

When Amazon S3 successfully creates your bucket, the console displays your empty bucket in the Buckets panel.

upload the files to the s3 bucket

Drag and drop files and folders you want to upload here, or choose **Add files**, or **Add folders**.

Files and folders (2 Total, 796.6 KB)

All files and folders in this table will be uploaded.

<input type="checkbox"/>	Name	Folder	Type	Size
<input type="checkbox"/>	claims.csv	-	text/csv	494.6 KB
<input type="checkbox"/>	customers.csv	-	text/csv	302.0 KB

▼ Sagemaker notebook

In the Amazon SageMaker Studio Control Panel, choose launch app/Open Studio.

- In JupyterLab, on the File menu, choose New, then Notebook. In the Select Kernel box, choose Python 3 (Data Science).

now print hello to see if the notebook is active also print the sagemaker version by running

```
import sagemaker
from sagemaker import get_execution_role
import sys
import IPython

print(sagemaker.__version__)
```

► Connecting to s3 and loading data

we have uploaded the data to s3 but how do we use that in our notebook

- we will use the boto3 api for loading data to and from s3
- because we are in a sagemaker environment we can directly access the s3 buckets
 - if you want to load data from somewhere other than s3 you can use the code that has been commented to access it
 - the access key and id can be obtained from the iam user profile page/security credentials
- if we do not know the bucket names or the file names we can print them out in the following manner
- now we can download the required files to the notebook storage to work on it
- after a few seconds of running the code the files will be downloaded
- it can now be read with pandas and proceeded with as usual.

↳ 2 cells hidden

EDA and preprocessing

- we can go on analysing the data plotting various features, checking the shape, size and missing values in the data.
- we also need to do some preprocessing and transformations like converting categorical values and one hot encoding of the data.
- we may also need to check if there is a bias in the data and handle that

```
# plot the number of claims filed in the past year
df_customers.num_claims_past_year.hist(density=True)
plt.suptitle("Number of Claims in the Past Year")
plt.xlabel("Number of claims per year")

df_claims.fraud.value_counts(normalize=True).plot.bar()
plt.xticks([0, 1], ["Not Fraud", "Fraud"]);
```

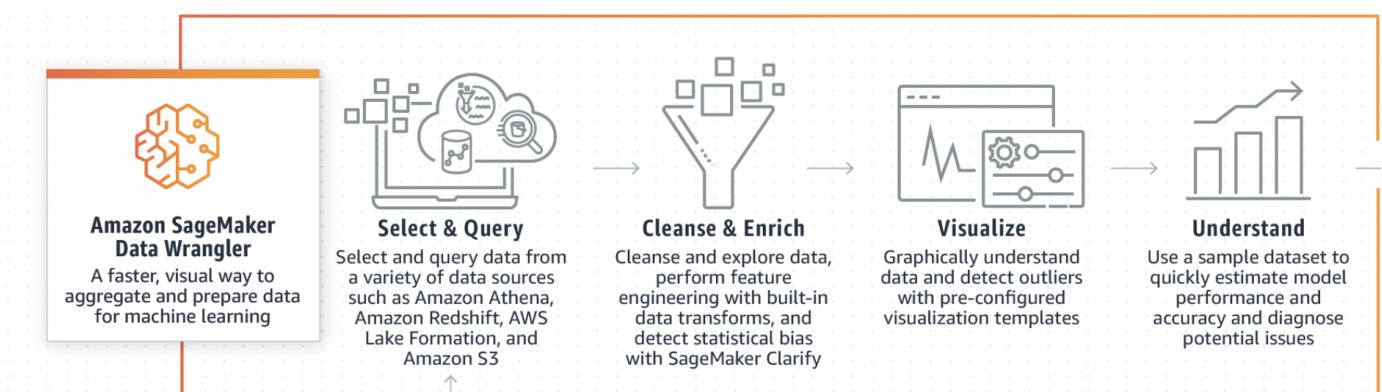
▼ Data Wrangler

Amazon SageMaker Data Wrangler reduces the time it takes to aggregate and prepare data for machine learning (ML) from weeks to minutes. With SageMaker Data Wrangler, you can simplify the process of data preparation and feature engineering, and complete each step of the **data**

preparation workflow, including data selection, cleansing, exploration, and visualization from a single visual interface.

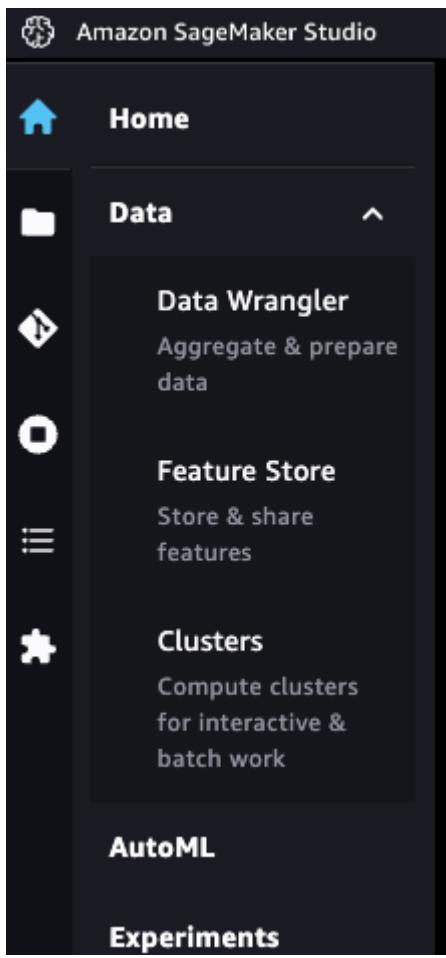
Using SageMaker Data Wrangler's data selection tool, you can choose the data you want from various data sources and import it with a single click. Once data is imported, you can use the data quality and insights report to automatically verify data quality and detect abnormalities, such as duplicate rows and target leakage.

SageMaker Data Wrangler contains over 300 built-in data transformations so you can quickly normalize, transform, and combine features without having to write any code. With SageMaker Data Wrangler's visualization templates, you can quickly preview and inspect that these transformations are completed as you intended by viewing them in Amazon SageMaker Studio, the first fully integrated development environment (IDE) for ML.

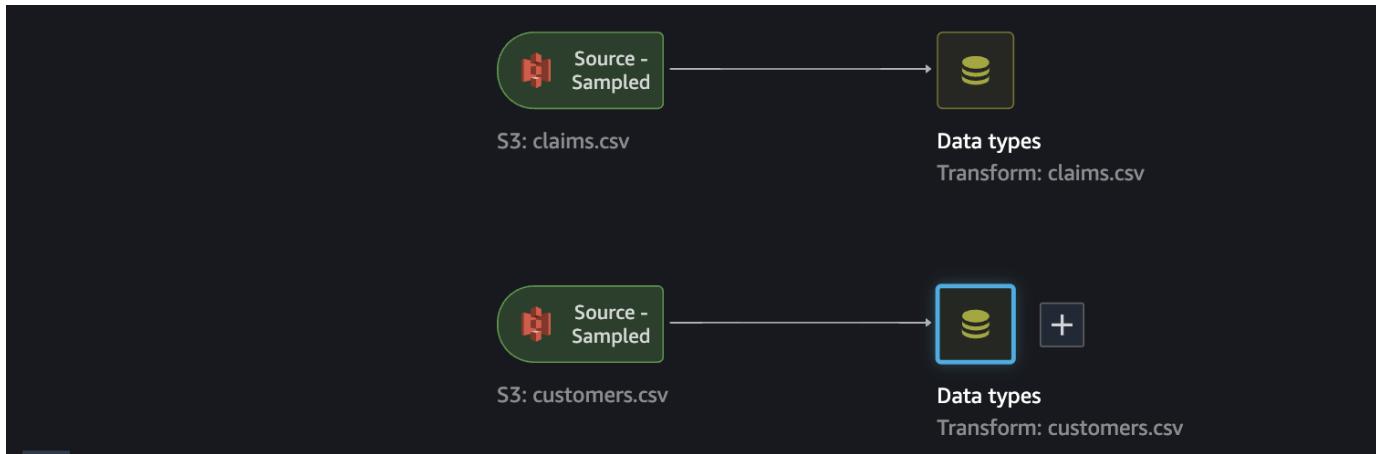


To access Data Wrangler in Studio:

- When Studio opens, select the + sign on the data card under This creates a new directory in Studio with a .flow file inside, which contains your data flow. The .flow file automatically opens in Studio.
- click on import data
- then click on s3, because we have our data stored there
- select the bucket and the files that you want to work on you can import one file at a time, so after importing the first click on import in the top again and import the second file



Double-click (or enter) to edit



- click on the plus sign to add transforms and analysis
- next in the data tab you have information about the data files and the features
- head to the analysis tab for all the analysis related to the data
- select the analysis type from

[All analyses](#)

Create analysis

Analysis type

Multicollinearity ▾

Bias Report

Custom Visualization

Data Quality And Insights Report

Duplicate rows

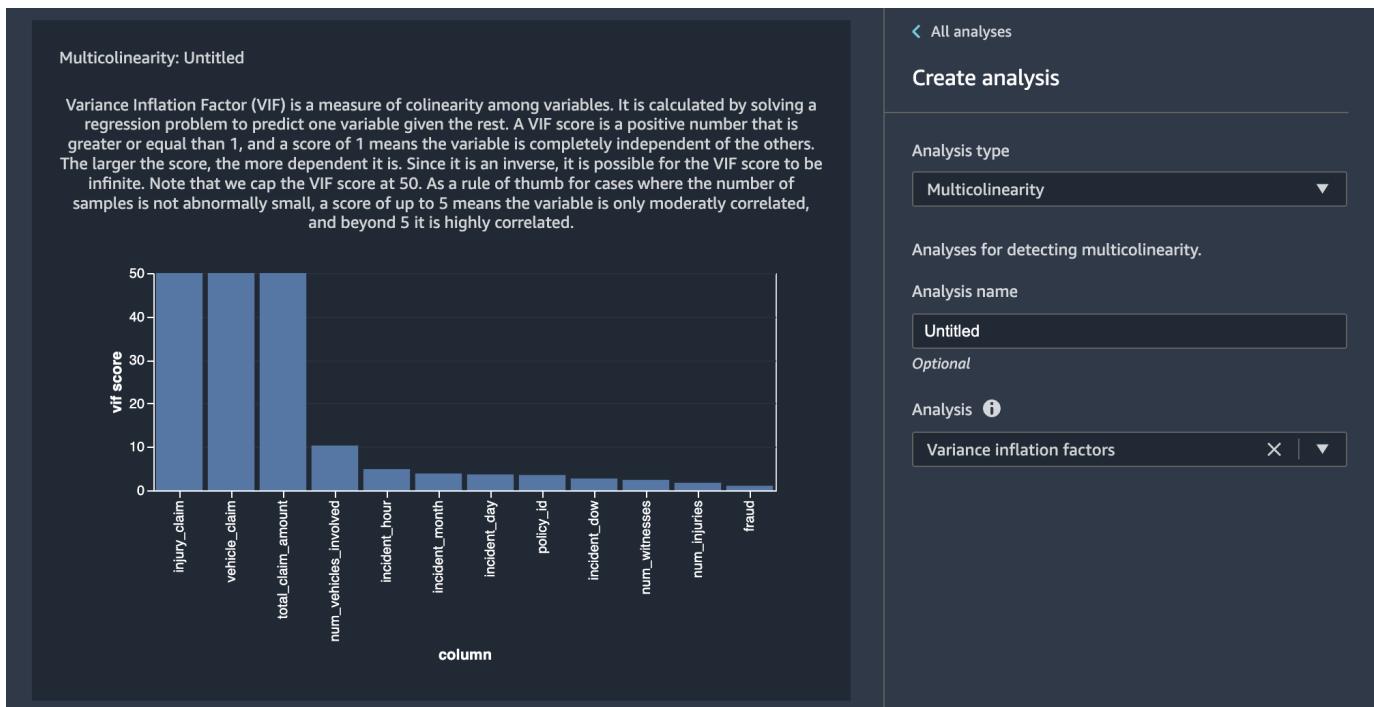
Feature Correlation

Histogram

Multicollinearity

Quick Model

Scatter Plot

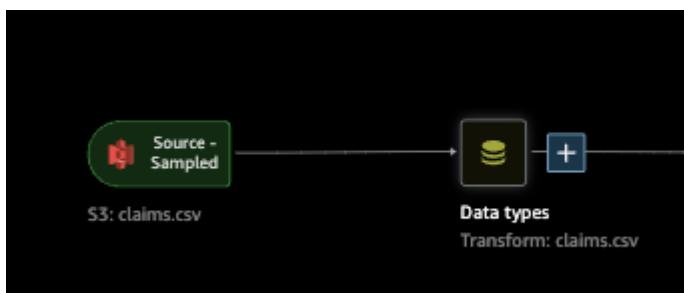


we can perform lots of transformation on the data

- SageMaker Data Wrangler offers a selection of 300+ pre-configured data transformations so you can transform your data into formats that can be effectively used for models without writing a single line of code.
- Pre-configured transformations cover common use cases such as impute missing data with mean or median, one hot encoding, and time-series specific transformers to accelerate the preparation of time series data for ML.
- You can also author custom transformations in PySpark, SQL, and Pandas.

we'll use some of those transformation today.

- click on the plus button on the side of the file and select add transform
- click on add step
- click on format string and select remove symbols
- then select all the columns
- and in symbols to remove put space and slash symbol ie: " /"



The screenshot shows the 'ALL STEPS' panel in the Sagemaker.ipynb - Colaboratory interface. A blue box highlights the 'Remove symbols' step under 'Transform'. The 'Input columns' section lists 'authorities_contacted', 'collision_type', 'driver_relationship', and 'incident_severity'. The 'Symbols' field contains a single character '/'. The 'Output column' field is empty. Buttons for 'Preview' and 'Update' are at the bottom.

ALL STEPS X

+ Add step

1. S3 Source

2. Data types

3. Remove symbols

Clean and prepare strings using standard string formatting operations. [Learn more.](#) ...

Transform

Remove symbols X | ▾

Removes all occurrences of the given characters from the string.

Input columns

authorities_contacted X collision_type X
driver_relationship X incident_severity X
incident_type X + 1 item selected X | ▾

Symbols ⓘ /

Optional

Output column ⓘ

Optional

Clear Preview Update

- The format string step is to be done for both the files for all string columns

After this we need to ordinal encode the incident severity column in the claims.csv file

ALL STEPS X

+ Add step

- ▶ 1. S3 Source
- ▶ 2. Data types
- ▶ 3. Remove symbols
- ▼ 4. Ordinal encode
Convert categorical variables to numeric or vector representations. [Learn more.](#)

Transform i

Ordinal encode X | ▾

Input columns i

incident_severity X | ▾

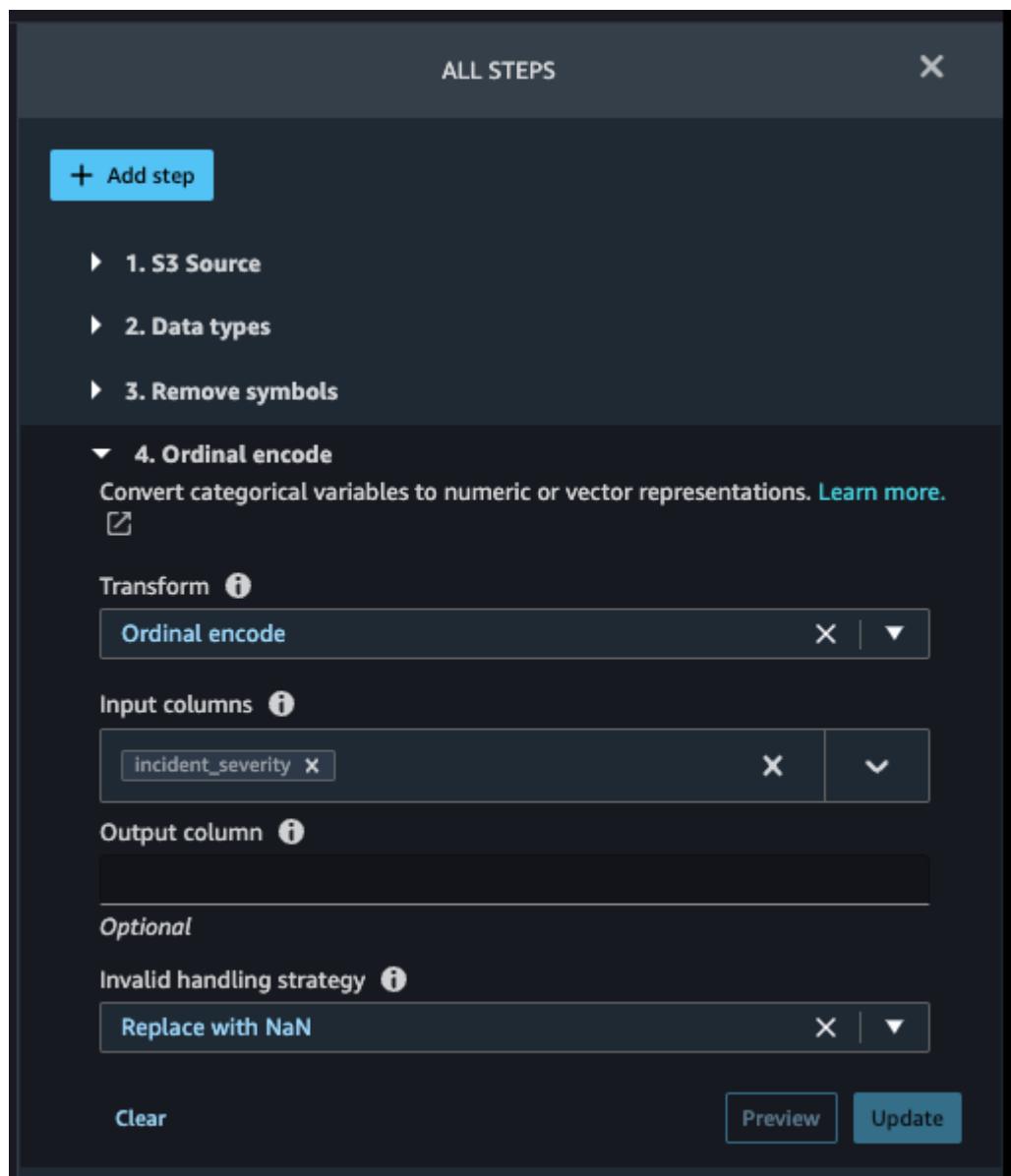
Output column i

Optional

Invalid handling strategy i

Replace with NaN X | ▾

Clear Preview Update



ALL STEPS X

+ Add step

- ▶ 1. S3 Source
- ▶ 2. Data types
- ▶ 3. Remove symbols
- ▶ 4. Ordinal encode
- ▼ 5. One-hot encode

Convert categorical variables to numeric or vector representations. [Learn more.](#)

Transform i

One-hot encode X | ▾

Input columns i

authorities_contacted X	collision_type X
driver_relationship X	incident_type X
police_report_available X	

Input already ordinal encoded i

Invalid handling strategy i

Keep X | ▾

Drop last i

Output style i

Columns X | ▾

Output column i

Optional

Clear Preview Update

for the claims table

- we ordinal encoded the incident_severity column
- one hot encoded the authorities_contacted, colision_type, driver_relationship, incident_type, police_report_available

for the customer table

- we one hot encode the customer_education, customer_gender, policy_state, policy_liability

after the preprocessing of the data we want to join the two tabels together

- for that in the data flow tab click on the plus button on any one table and select join
- then select the other table after transforms
- then click on configure to adjust the type of join we want and on which column
- in our case as we have the same policy_id we can use that as our join column and perform left join/right join

Data flow

Join

1. Select datasets 2. Preview

Datasets

- **Left**
Transform: customers.csv
- **Right**
Transform: claims.csv
- **Joined dataset**

Name
Join preview

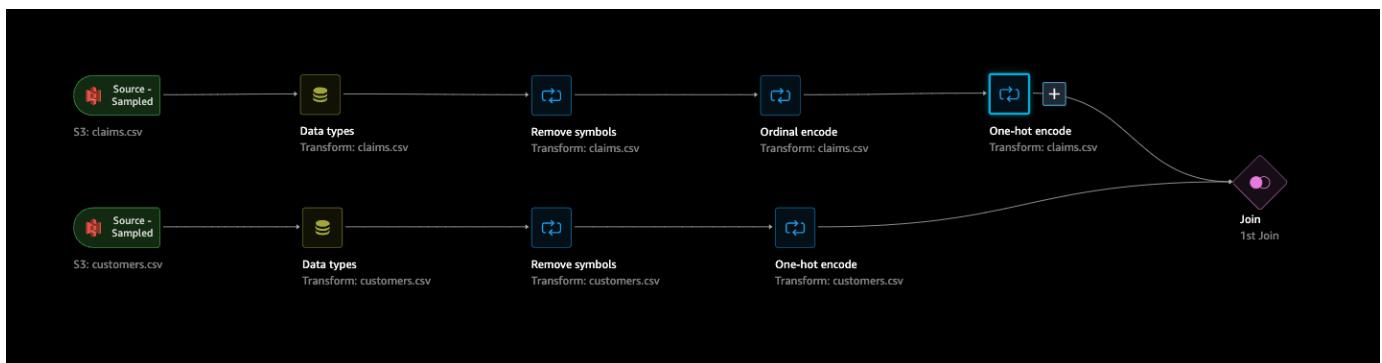
Optional

Join Type
Select the join type
 Left outer

Columns
Select Left and Right to join

Left	Right
policy_id	policy_id

[+]



The final data flow should look like this

► Save our work

Data Wrangler offers a few different ways to save your data.

- S3
- Sagemaker Feature Store

to save your data click on the plus button at the last cell and click on add destination where you want to store the data

we'll see both the ways of storing the data

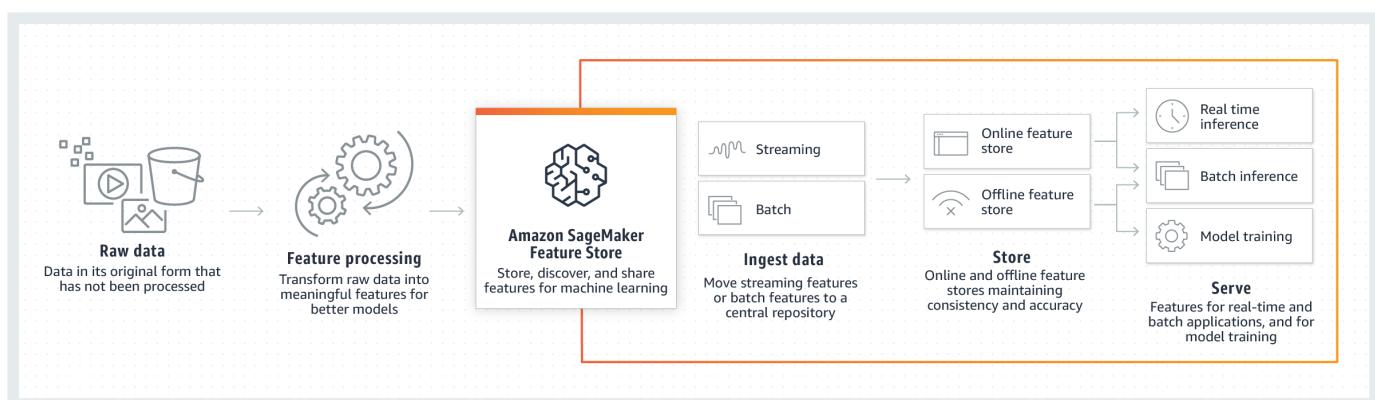
↳ 1 cell hidden

▼ Sagemaker Feature Store

Amazon SageMaker Feature Store is a fully managed, purpose-built repository to store, share, and manage features for machine learning (ML) models.

- Features built at different times and by different teams aren't consistent. Extensive and repetitive feature engineering work is often needed when productionizing new features. Difficulty tracking versions and up-to-date features aren't easily accessible.

Feature Store is a centralized store for features and associated metadata so features can be easily discovered and reused. helps data science teams reuse ML features across teams and models, serve features for model predictions at scale with low latency, and train and deploy new models more quickly and effectively.



► How Feature Store Works

In Feature Store, features are stored in a collection called a feature group. You can visualize a feature group as a table in which each column is a feature, with a unique identifier for each row. In principle, a feature group is composed of features and values specific to each feature. A

Record is a collection of values for features that correspond to a unique RecordIdentifier. Altogether, a FeatureGroup is a group of features defined in your FeatureStore to describe a Record.

You can use Feature Store in the following modes:

- Online – In online mode, features are read with low latency (milliseconds) reads and used for high throughput predictions. This mode requires a feature group to be stored in an online store.
- Offline – In offline mode, large streams of data are fed to an offline store, which can be used for training and batch inference. This mode requires a feature group to be stored in an offline store. The offline store uses your S3 bucket for storage and can also fetch data using Athena queries.
- Online and Offline – This includes both online and offline modes.

You can author features using Amazon SageMaker Data Wrangler, create feature groups in Feature Store and ingest features

[] ↗ 9 cells hidden

▼ Scheduling our preprocessing step

With support for scheduling in Data Wrangler, you can now schedule a Data Wrangler processing job in a few clicks.

- Jobs can be scheduled to run at specific times and days of the week. Schedules can also be inputted as expressions for additional customization and flexibility (for instance to schedule a job that runs on the first Wednesday of a calendar month).
- You can attach up to two schedules to a Data Wrangler processing job. Once a desired schedule has been entered, Data Wrangler displays a preview of the next five upcoming job runs for additional confirmation.
- You can access this scheduling capability as part of the “Create Job” workflow in Data Wrangler.

Before we create a schedule we need to manage some permissions around it

► IAM Roles and Permissions

<https://docs.aws.amazon.com/IAM/latest/UserGuide/introduction.html>

- AWS Identity and Access Management (IAM) is a web service that helps you securely control access to AWS resources. You use IAM to control who is authenticated (signed in) and authorized (has permissions) to use resources.

An AWS IAM policy defines the permissions of an identity (users, groups, and roles) or resource within the AWS account. An AWS IAM policy regulates access to AWS resources to help ensure that only authorized users have access to specific digital assets. Permissions defined within a policy either allow or deny access for the user to perform an action on a specific resource.

↳ 4 cells hidden

▶ Granting access and adding permissions

- open the iam console
- choose roles because we want to add those permissions to sagemaker role

↳ 7 cells hidden

▼ Schedule job

- click on create job in the right top side of the sagemaker console
- it will open a create job tab on the left side
- if you have the output set it will directly pick the file name or give a name
- next you can configure how you want to run the job
- here you can add tags or change the resources allocated to this job
- then most importantly add schedule to the job

[Import](#)[Data Flow](#)

Create job

**1**

Select destination nodes

Job name**1. S3: combined_processed.csv**[Unselect all](#)**Output KMS key** *Optional***Trained parameters** 10[View all](#)**Refit**

if you have a schedule created it will show there or you can click on create new schedule

- give a name to the schedule (you can use this schedule for other things in event bridge as well)
- select the days or time or custom order when you want it to run
- check the previewed schedule and then create it

Schedule Name
every_monday

Run Frequency *i*
Start time *i*
On days

Select days
 Monday Tuesday Wednesday Thursday Friday Saturday Sunday

Preview Schedule *i*
5 upcoming occurrences

Mon Oct 31 2022 01:00:00 GMT+0530
Mon Nov 07 2022 01:00:00 GMT+0530
Mon Nov 14 2022 01:00:00 GMT+0530
Mon Nov 21 2022 01:00:00 GMT+0530
Mon Nov 28 2022 01:00:00 GMT+0530

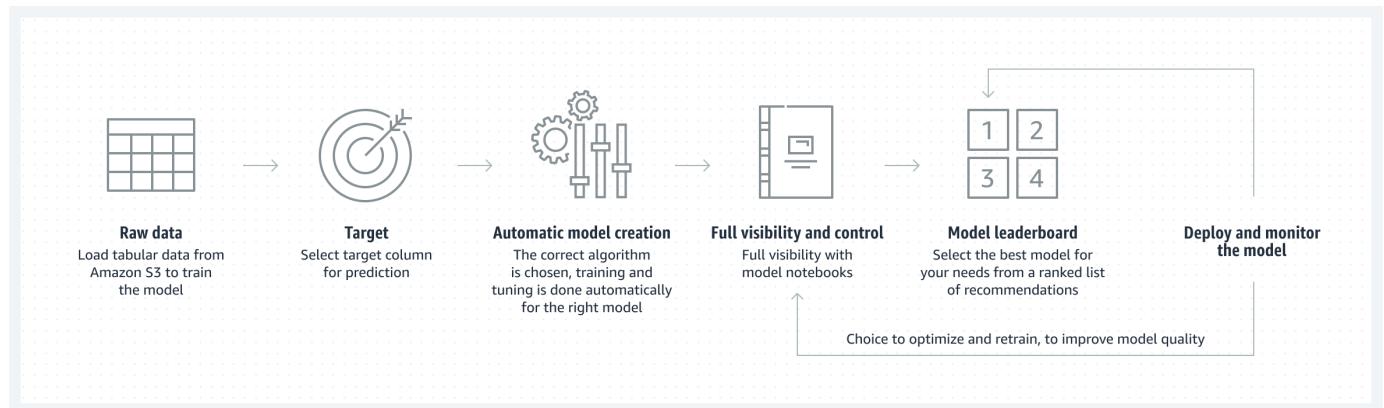
Cancel Create

▼ Sagemaker Autopilot

[Amazon SageMaker Autopilot](#) automatically builds, trains, and tunes machine learning models in the cloud based on your data, while maintaining full control and visibility.

Typically, to build a machine learning (ML) model you need to manually prepare data, test different algorithms, and optimize model parameters to find the best approach for your data. This is time consuming and requires specialized expertise. An alternative is to use fully automated machine learning methods (AutoML), but these methods often do not provide insight into how data affect model predictions. As a result, they are not reproducible, and do not provide visibility into how they make decisions, so are less reliable.

Amazon SageMaker Autopilot provides a middle ground between these two approaches. It lets you provide a dataset, have SageMaker automatically identify, train, and tune the best ML models for the data, and get in-depth visibility into how the model is working and why it generates its predictions.



▼ Autopilot insights inside the model

- first notebook is data exploration, describing Autopilot's conclusions based on your provided data
- second notebook is candidate definition—it generates candidate models using the information about your data.
- The third notebook is a model insight report detailing the best-performing model's characteristics.
- Amazon SageMaker Clarify provides tools that SageMaker Autopilot uses to explain how ML models make predictions. Developers and ML model creators can use these tools to understand a model's characteristics before deploying it.

you can get all the details of the model like the architecture, hyperparameters to understand the results and reproducibility and the created model as an artefact so that it can be used elsewhere

Data Analysis Training **NEW**

Export data and train a model with SageMaker Autopilot

Amazon Sagemaker Autopilot trains models on data stored in an Amazon S3 bucket. Export your data to an S3 bucket to automatically train a model using SageMaker Autopilot.

Amazon S3 location

Browse

File type

CSV (*.csv)

KMS key ID or ARN ⓘ

Optional

! You've chosen to sample the first 50000 rows of your data. Use First K sampling when the order of the observations in your sample matters.

To train a model on the entire dataset, import your data again without sampling.

Export and train

- for training the model on the data that you created you can click on the training tab along the analysis tab
- you need to specify the location for the exported data to be
- then create an autopilot experiment
- there will be a default experiment name or you can give out your own name

Create an Autopilot experiment

When you create an Autopilot experiment, Amazon SageMaker analyzes your data and creates a notebook with candidate model definitions. This notebook provides visibility into how models are selected, trained, and tuned.

Experiment and data details Target and features Training method Deployment and advanced settings Review and create

Experiment name ⓘ

Experiment-1667673159045

✓ Data exported successfully! ×

Input data
Specify the input data location and choose how to split your data.

S3 location ⓘ

s3://sagemaker-ap-south-1-189551856594/car-insurance/output/output_1667673156/part-00000-814b3cce-9c63-4ed4-a51e-90e8d505f5t

No

Yes

Output data
Specify the output data location.

Auto create output data location? ⓘ

Cancel Next: Target and features

Create an Autopilot experiment

When you create an Autopilot experiment, Amazon SageMaker analyzes your data and creates a notebook with candidate model definitions. This notebook provides visibility into how models are selected, trained, and tuned.

Experiment and data details

Training method

Deployment and advanced settings

Review and create

Training method

Select the training method for solving your machine learning problems.

Auto

Let Autopilot automatically decide the training method based on your dataset size.

Ensembling

Autopilot uses an AutoML algorithm that trains a multi-layer stack ensemble model to predict on regression and classification datasets directly from your data.

Hyperparameter optimization (HPO)

Autopilot finds the best version of a model by tuning hyperparameters and running training jobs on your data set.

Cancel

Previous: Experiment and data details

Next: Deployment and advanced settings

- set the target column which in our case is the fraud column
- then we also want to remove policy_id column from training, because it is just an index column
- in the training method select hyperparameter tuning, because that will give us a simple model that is tuned on all hyperparameters. Autopilot will select models based on the category of the problem and run tuning jobs to get the best results among different odels and different hyperparametr
- then set the problem type that in our case is a binary classification. and the objective that we want to improve like accuracy or f1 score

The screenshot shows the 'Deployment and advanced settings' step of the Autopilot wizard. At the top, there are tabs for 'Experiment and data details', 'Target and features', 'Training method', 'Deployment and advanced settings' (which is active), and 'Review and create'. Below the tabs, under 'Deployment settings', it says 'Auto deploy creates an endpoint that deploys your best model and runs inference on the endpoint. Inference incurs account charges, but you can modify or delete the endpoint.' A 'Learn more' link is provided. A toggle switch for 'Auto deploy?' is set to 'No'. Under 'Advanced settings (optional)', the 'Machine learning problem type' section is selected. It asks to 'Specify the type of machine learning problem for Autopilot to solve.' A dropdown menu shows 'Binary classification' selected. Another dropdown menu for 'Objective metric' shows 'F1' selected. On the left sidebar, other optional settings like 'Runtime', 'Access', 'Encryption', 'Security', 'Project', and 'Tags' are listed. At the bottom right, there are buttons for 'Cancel', 'Previous: Training method', and 'Next: Review and create'.

finalize it and then it will create a new experiment -

here you can see all the models and experiments by autopilot

- on the top you can see the candidate generation notebook and the data exploration notebook. You can have a look at this to understand the data more
- click on any model to view its details and the hyperparameters used with it
- we can also see the best results at the top with lots of details around the different metrics

AUTOPilot JOB

Experiment-1667673159045

Problem type: BinaryClassification

[Open candidate generation notebook](#) [Open data exploration notebook](#)

Models Job profile

the f1 score as we can see is pretty low

- this is because the data is pretty imbalanced
- we can also check this in the data exploration notebook

we can handle this with data wrangler

- we can go back to data wrangler flow and add data balancing step
- we can solve this with over/under sampling and SMOTE and then train again

Experiment-16676731...	0.083	0.083	0.599	0.447	Completed	10 minutes ago
AUTOPilot JOB						
Open candidate generation notebook Open data exploration notebook						
Experiment-1667676857113						
Problem type: BinaryClassification						
Models	Job profile					
Best model ?	Binary_f_beta Objective	F1	LogLoss	Recall	Precision	AUC
Experiment...	0.987	0.984	0.097	0.999	0.969	0.996
0 rows selected						
Model name	Objective: F1_binary	F1	AUC	Accuracy	Status	Start time
Experiment-16676768...	0.984	0.984	0.996	0.984	Completed	17 minutes ago
Experiment-16676768...	0.983	0.983	0.995	0.983	Completed	15 minutes ago
Experiment-16676768...	0.983	0.983	0.993	0.983	Completed	19 minutes ago
Experiment-16676768...	0.982	0.982	0.994	0.981	Completed	20 minutes ago
Experiment-16676768...	0.982	0.982	0.994	0.981	Completed	20 minutes ago
Experiment-16676768...	0.981	0.981	0.994	0.981	Completed	19 minutes ago
Experiment-16676768...	0.98	0.98	0.994	0.98	Completed	19 minutes ago
Experiment-16676768...	0.979	0.979	0.994	0.979	Completed	19 minutes ago
Experiment-16676768...	0.978	0.978	0.991	0.978	Completed	14 minutes ago
Experiment-16676768...	0.782	0.782	0.86	0.787	Completed	15 minutes ago
Experiment-16676768...	0.67	0.67	0.745	0.681	Completed	19 minutes ago
Experiment-16676768...	0.665	0.665	0.727	0.675	Completed	10 minutes ago

you can track all the experiments and jobs in the sagemaker console sidebar from where you launched the sagemaker studio.

all the informations about the running jobs their results and status can be monitored from this console

