



19 August 2021

Sentiment Analysis using Amazon Aurora Machine learning integration

Suman Debnath

Principal Developer Advocate

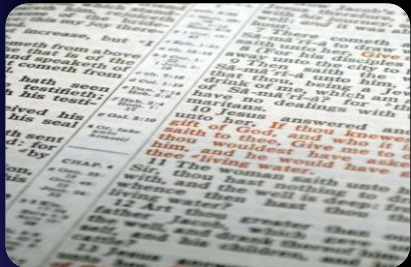
AISPL



Machine Learning almost everywhere

WHAT DATA DOES MACHINE LEARNING USUALLY RUN ON ?

Text



Images



Video



Tabular data

| Dessert (100g serving) | Calories | Fat (g) | Carbs (g) | Protein (g) |
|------------------------|----------|---------|-----------|-------------|
| Frozen yogurt | 159 | 6.0 | 24 | 4.0 |
| Ice cream sandwich | 237 | 9.0 | 37 | 4.3 |
| Eclair | 262 | 16.0 | 24 | 6.0 |
| Cupcake | 305 | 3.7 | 67 | 3.9 |
| Gingerbread | 356 | 16.0 | 49 | 0.0 |

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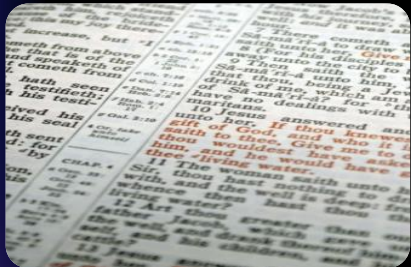
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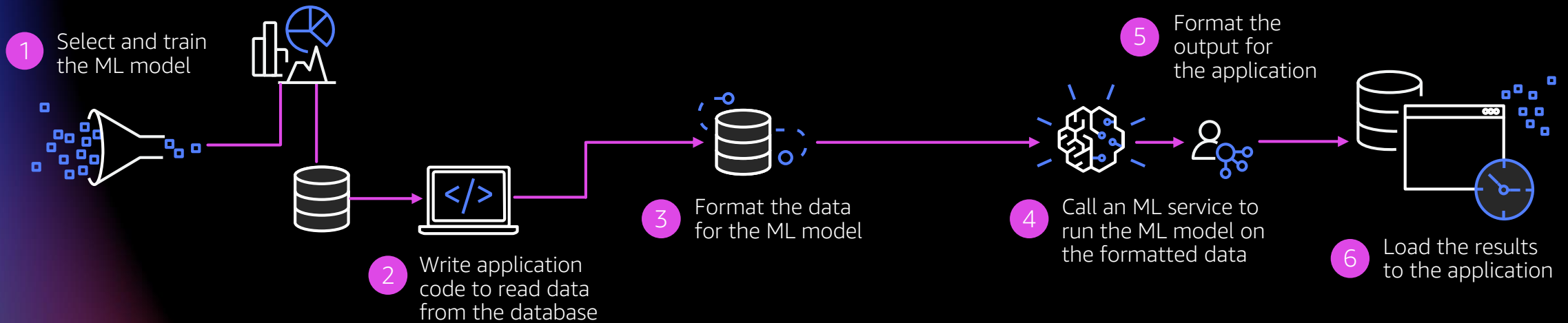
and many more ...

Today, we will focus on
"Data which are located in Relational database"

How can your application use it to make prediction?

Adding ML to an application is challenging

Typical steps require ML expertise & manual work



Amazon Aurora ML

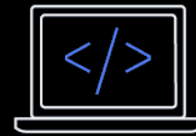
SIMPLE, OPTIMIZED, AND SECURE AURORA, AMAZON SAGEMAKER, AND AMAZON COMPREHEND INTEGRATION



ML predictions
on relational data



Integration with
Amazon SageMaker &
Amazon Comprehend



Familiar SQL
language,
no ML expertise

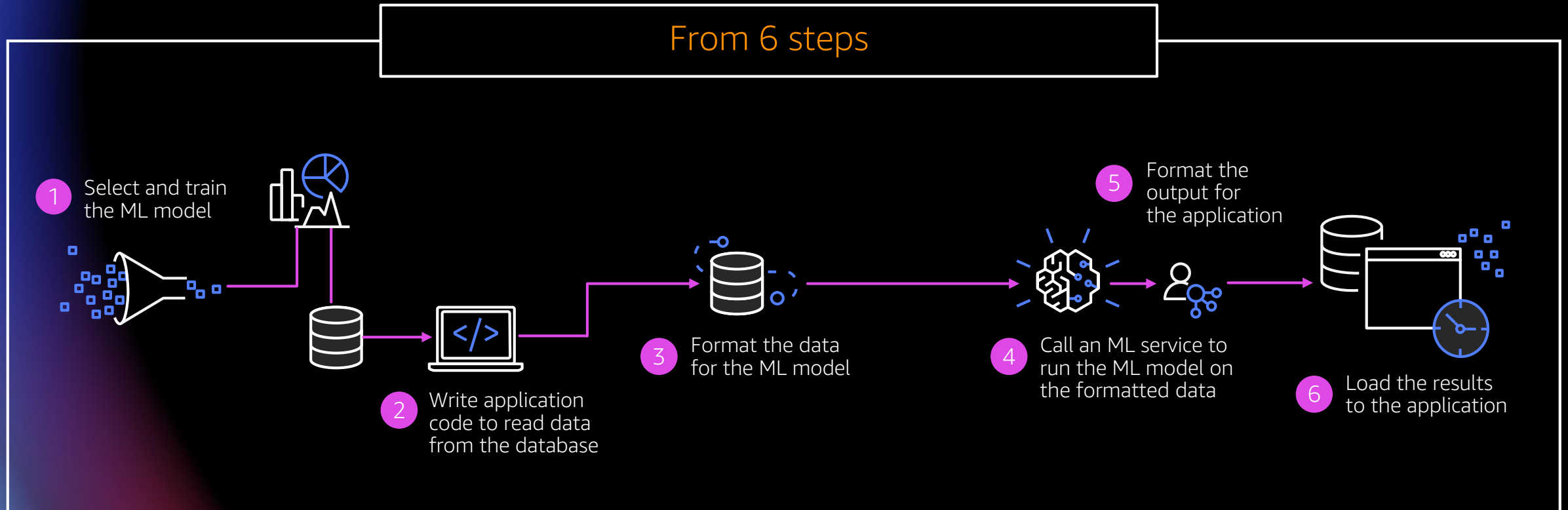


Low-latency,
immediate

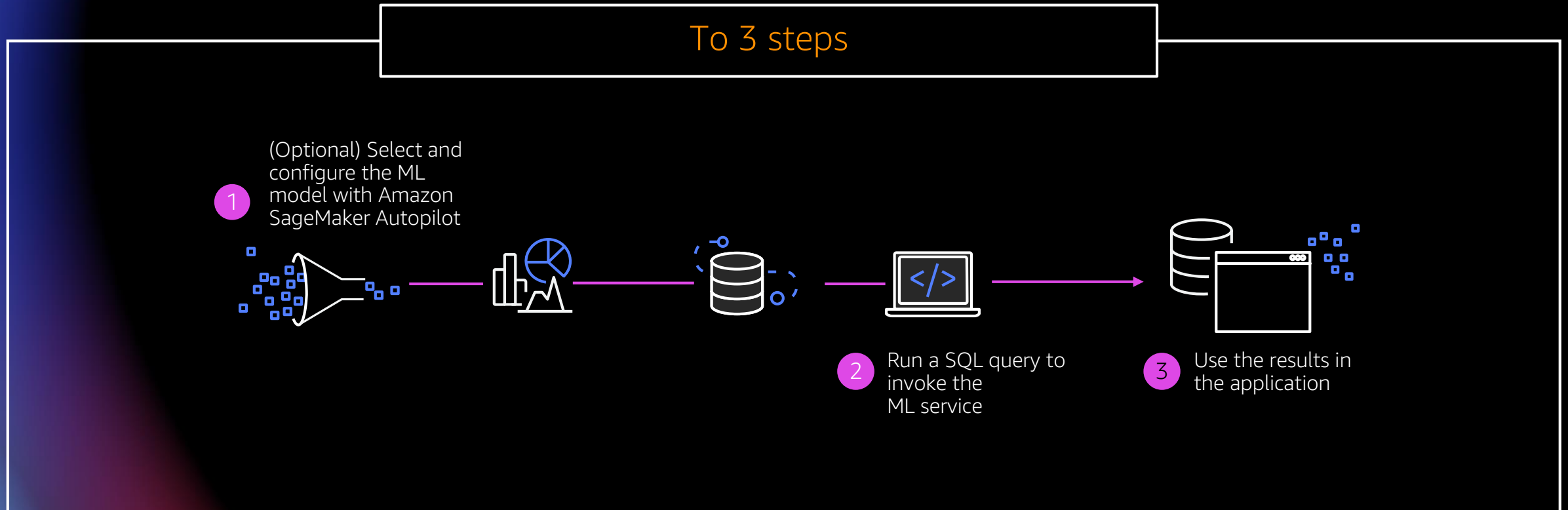


Security & governance

Before: 6 steps



Now: 3 steps



Use the familiar SQL language for training & prediction

Amazon Aurora

ENTERPRISE DATABASE AT OPENSOURCE PRICE



Amazon Aurora

Delivered as a **managed** service

Drop-in compatibility with **MySQL** and **PostgreSQL**

Simplicity and **cost-effectiveness** of open-source databases

Throughput and **availability** of commercial databases

Simple **pay-as-you-go** pricing

The AWS Machine Learning Stack

BROADEST AND MOST COMPLETE SET OF MACHINE LEARNING CAPABILITIES

SEARCH

Amazon
Kendra

BUSINESS TOOLS

Amazon
Fraud Detector

Amazon
Lookout for Metrics

HEALTHCARE

Amazon
HealthLake

Amazon
Transcribe Medical

Amazon
Lookout for Vision

INDUSTRIAL

AWS
Panorama Appliance

Amazon
Lookout for Equipment


Amazon
Monitron

AI SERVICES

VISION



Amazon
Rekognition

SPEECH


Amazon
Polly


Amazon
Transcribe


TEXT


Amazon
Translate


Amazon
Comprehend
+ Medical


Amazon
Textract


CHATBOTS


Amazon
Lex

PERSONALIZATION


Amazon
Personalize

FORECASTING


Amazon
Forecast

SageMaker Studio IDE



AMAZON
SAGEMAKER

Ground Truth
data labelling

ML
Marketplace

Built-in
algorithms

SageMaker
Notebooks

SageMaker
Experiments

Model
training

SageMaker
Debugger

Model
tuning


SageMaker
Autopilot

Model
hosting

SageMaker
Model Monitor

SageMaker
Neo

ML FRAMEWORKS & INFRASTRUCTURE

 TensorFlow

 mxnet

 PyTorch

 GLUON

 Keras



Deep Learning
AMIs & Containers

GPUs and
CPUs

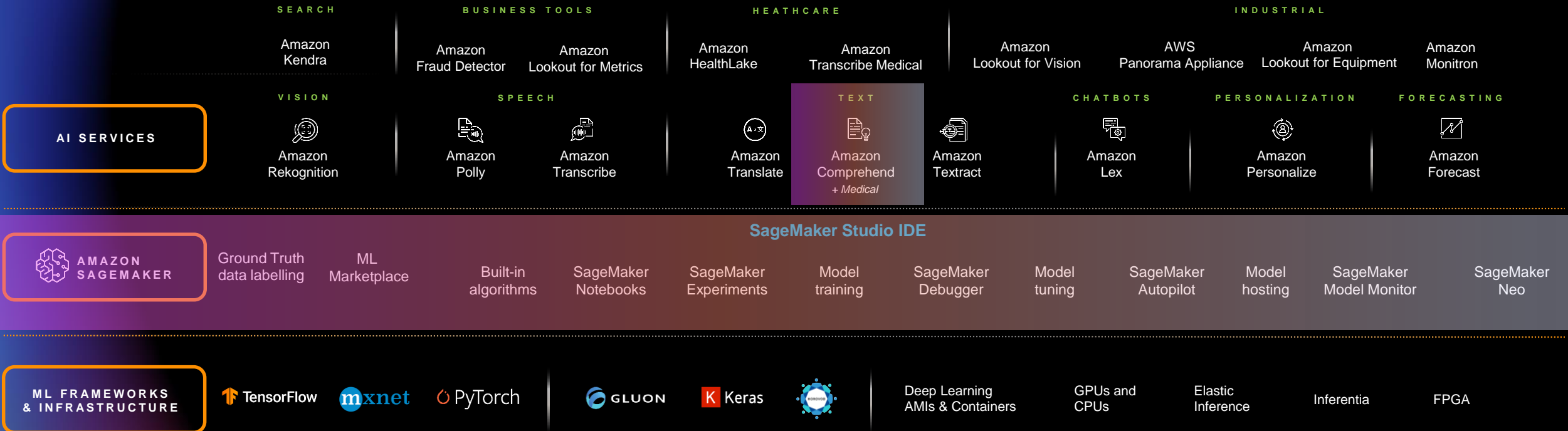
Elastic
Inference

Inferentia

FPGA

The AWS Machine Learning Stack

BROADEST AND MOST COMPLETE SET OF MACHINE LEARNING CAPABILITIES

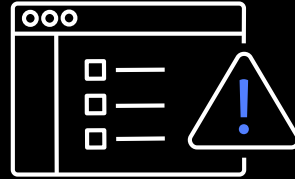


Calling **ML models** from Aurora

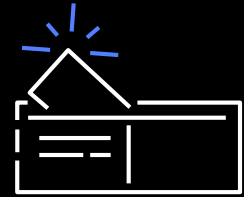
Find **suspected**
fraudulent transactions



Flag comments with
negative sentiment



Sort customers by **predicted**
future spend

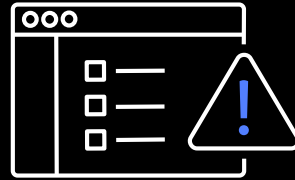


ML driven *insights* using SQL

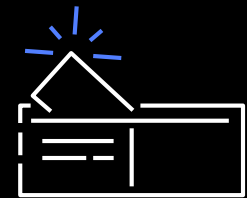
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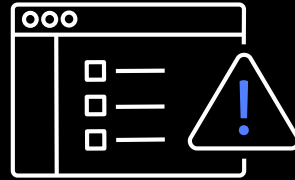
```
CREATE TRIGGER insert_check
BEFORE INSERT ON sales
FOR EACH ROW
BEGIN
  IF is_transaction_fraudulent(column1,
    column2, column3 ...) = 'True' THEN
    rollback; END IF;
END;
```

ML driven *insights* using SQL

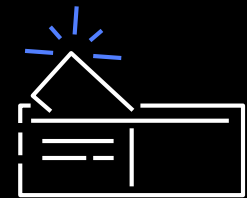
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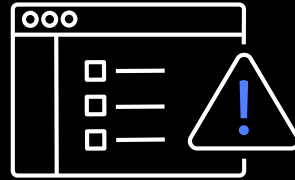
```
SELECT * FROM product_reviews
WHERE aws_comprehend_detect_sentiment(review_text, 'en') = 'NEGATIVE';
```

ML driven *insights* using SQL

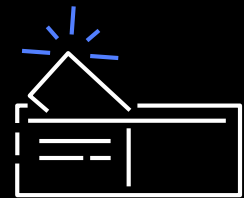
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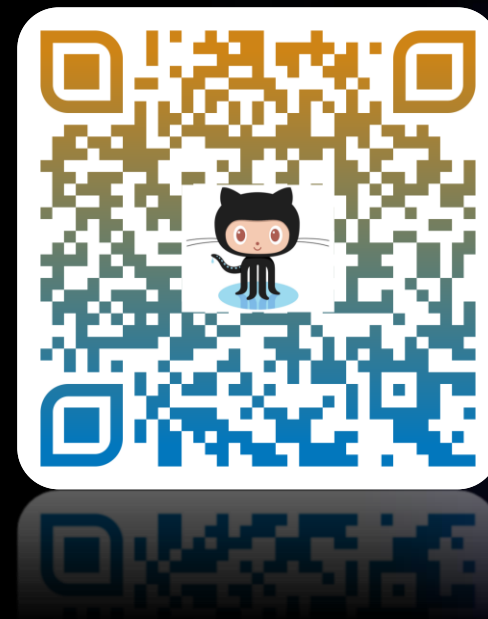
```
SELECT * FROM customers  
ORDER BY predicted_future_spend (column1, column2, ... )
```

Demo

- Sentiment Analysis using Aurora ML integration
- Customer churn analysis with Amazon SageMaker

GitHub

/debnsuma/AuroraML



Visit the **AWS Data Resource Hub**

Dive deeper with these resources, get inspired and learn how you can use data to make better decisions and innovate faster.

- Building a winning data strategy
- The new leadership mindset for data & analytics
- Harness data to reinvent your organization
- Put your data to work with a modern analytics approach
- Breaking free from on-premises database constraints
- Cloud storage adoption: From cost optimization to agility & innovation
- A strategic playbook for data, analytics, and machine learning
- ... and more!

<https://tinyurl.com/aws-data-resource>



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Thank you!