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AWS Based Sentiment Analysis Project



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TEAM MEMBERS



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Introduction

In today's digital age, social media platforms generate massive amounts of unstructured data that offer valuable insights. This project leverages machine learning to classify tweets in real time as either "happy" or "sad," using AWS SageMaker. Analyzing social sentiment, it can help businesses, researchers, and organizations understand public opinion, monitor brand reputation, and make data-driven decisions..





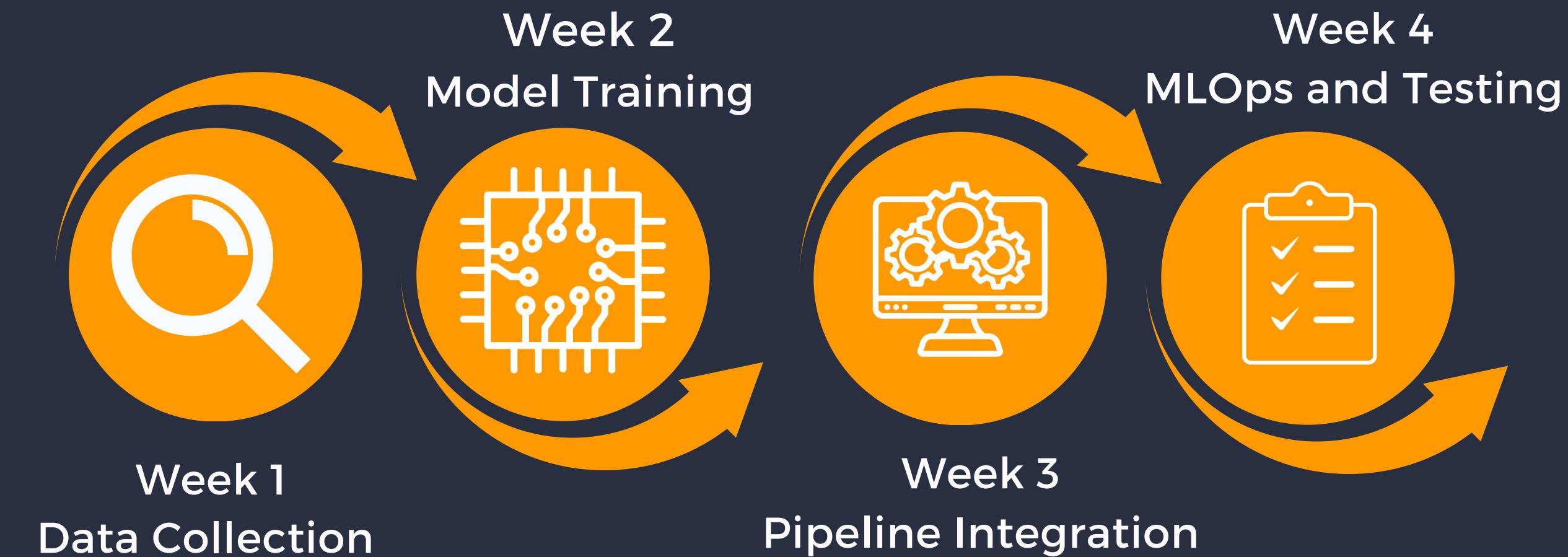
SENTIMENT ANALYSIS
**USED AWS
SERVICES**



Sentiment Analysis

AWS **SAGEMAKER**

PROJECT SEQUENCE

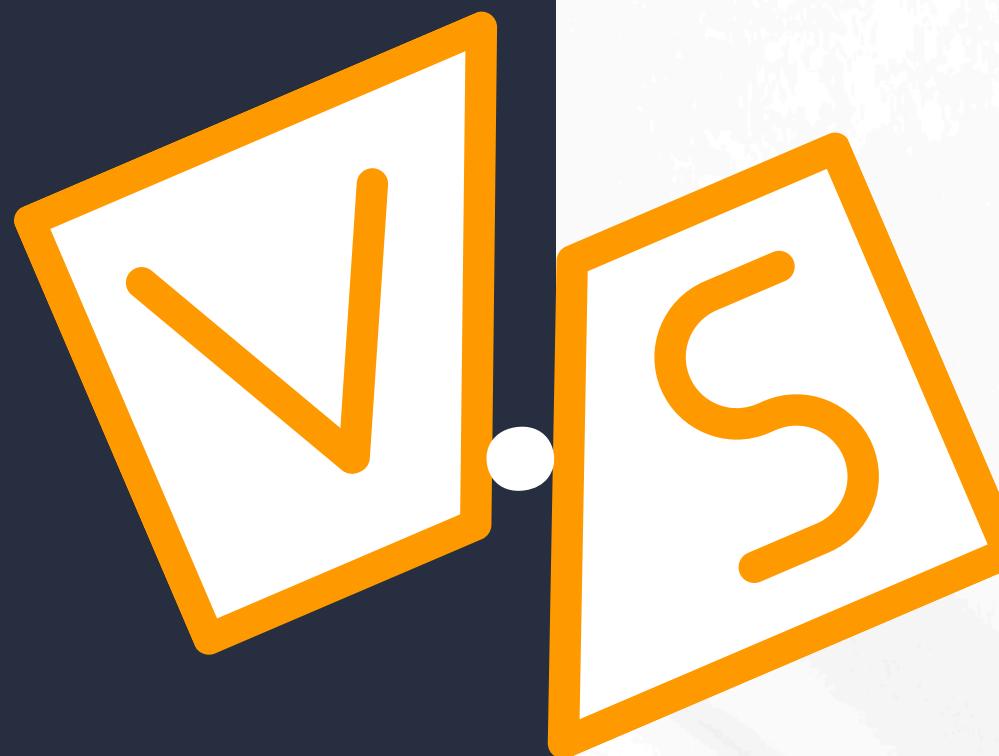


AWS SAGEMAKER IMPLEMENTATION

- 1 Set up SageMaker for model training, tuning, and deployment.
- 2 Facilitated seamless storage of data and model artifacts in S3.
- 3 Configured the real-time SageMaker endpoint for predictions



AWS SERVICES



LOCALLY TRAINED

PERFORMANCE MONITORING AND SCALABILITY

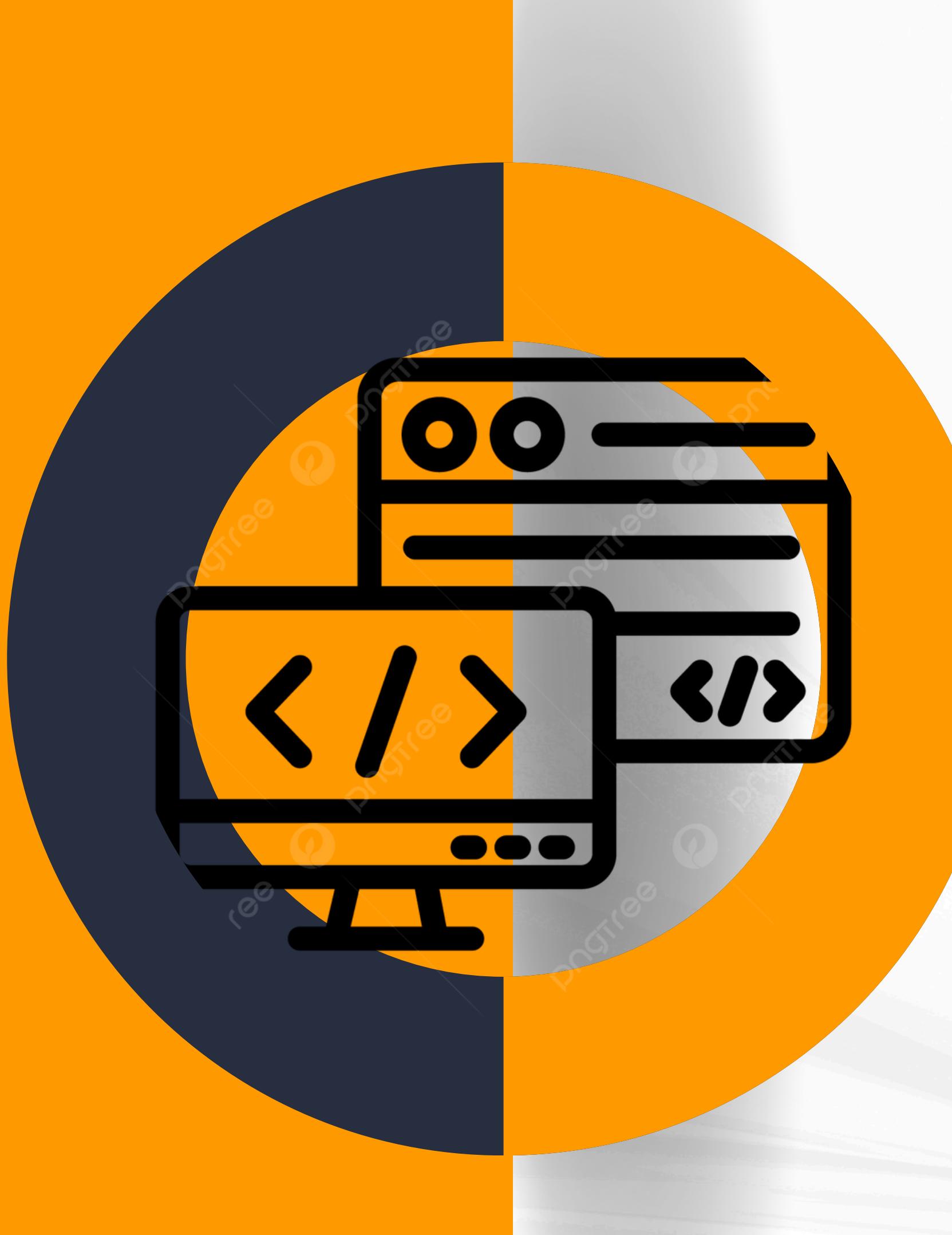
- 1 Monitored model performance using AWS CloudWatch.
- 2 Optimized endpoint scalability for handling high prediction loads.
- 3 Implemented alerts for detecting issues in real-time prediction.



PROBLEM-SOLVING AND FINAL ANALYSIS

- 1** Resolved challenges related to model deployment and integration
- 2** Analyzed model performance through metrics like accuracy and confusion matrix.
- 3** Delivered the final performance report with detailed analysis.





Sentiment Analysis

BACKEND DEVOLPMENT

BACKEND INTEGRATION AND API DEVELOPMENT



- 1 Role: Backend Developer and AWS Integration Specialist
- 2 Integrated SageMaker endpoint with external applications using APIs.
- 3 Ensured efficient data handling and communication with the model.

REAL-TIME DATA PROCESSING

1

Set up mechanisms to trigger sentiment analysis for new tweets.

2

Implemented error handling and data validation processes

3

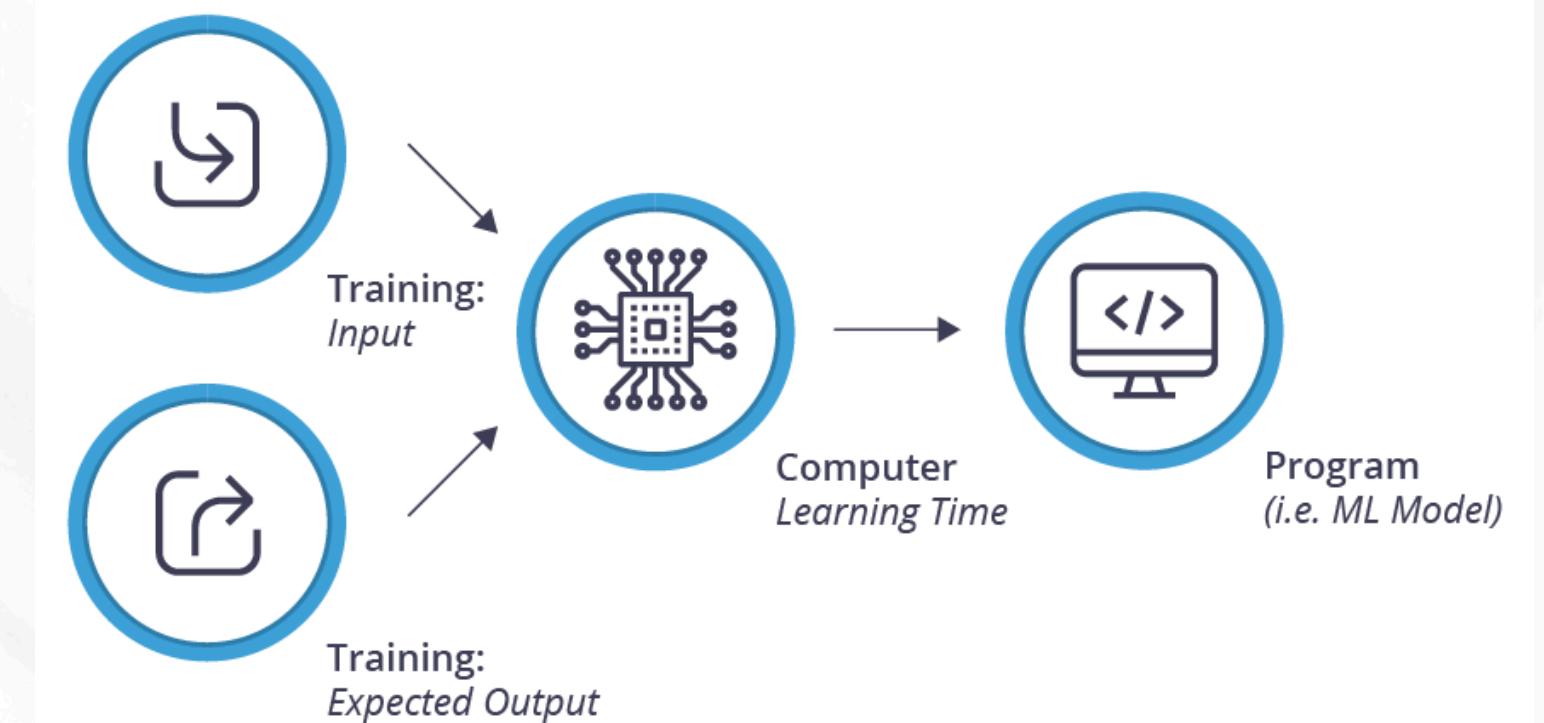
Assisted in debugging and optimizing backend operations.

Sentiment Analysis

MODEL TRAINING &

PERFORMANCE EVALUATION

The Machine Learning Training Process



MODEL TRAINING

1

Fine-tuned BlazingText model's hyperparameters (learning rate, batch size).

2

SageMaker

Utilized SageMaker's built-in tuning functionality which Aimed for optimal accuracy while minimizing training loss.

3

Ran multiple training jobs to test different configurations.

EVALUATION AND MODEL HEALTH MONITORING

1

Set up CloudWatch alerts for real-time model health tracking

2

Reviewed results to ensure consistent prediction quality.

3

Provided recommendations for model improvements

DEPLOYMENT AND TESTING EXPERTISE

The image shows a Microsoft Visual Studio Code (VS Code) interface with several open files and a prominent terminal window.

File Explorer: Shows the project structure under "MY-APP".

Code Editor: The active file is "App.js".

```
src > App.js > App > handleSubmit > response
1 import React, { useState, Suspense } from 'react';
2 import { Container, Grid, TextField, Button, Typography, CircularProgress } from '@mui/material';
3
4 // Lazy load for performance optimization
5 const PredictionResult = React.memo(({ prediction }) => {
6   return prediction ? <Typography variant="h6">Prediction: (prediction)</Typography> : null;
7 });
8
9 function App() {
10   const [inputText, setInputText] = useState('');
11   const [prediction, setPrediction] = useState('');
12   const [loading, setLoading] = useState(false);
13
14   const handleSubmit = async () => {
15     setLoading(true); // Show loading while fetching
16     try {
17       const response = await fetch('https://3b2j2gjuzh.execute-api.us-east-1.amazonaws.com/dev/predict', {
18         method: 'POST',
19         headers: {
20           'Content-Type': 'application/json',
21         },
22         body: JSON.stringify({ text: inputText }),
23       });
24     }
25   };
26 }
```

Terminal:

```
Serving!
- Local: http://localhost:3000
- Network: http://192.168.1.3:3000
Copied local address to clipboard!
```

Status Bar:

- Ln 17, Col 109 Spaces: 4 UTF-8 LF
- JavaScript AI Code Chat
- 24°C (W) 11:41 PM 10/9/2024

DEPLOYMENT AND TESTING OF MODEL

1

Led deployment of the sentiment analysis model on SageMaker.

2

Ensured Endpoint security with IAM roles and API Gateway.

3

Conducted tests to ensure real-time performance of the model.



SYSTEM INTEGRATION AND DOCUMENTATION

1

Worked on troubleshooting deployment issues.

2

Supported the team in optimizing testing procedures.

3

Conducted tests to ensure real-time performance of the model.

Sentiment Analysis

Enter your text

I just finished reading a book that completely changed my perspective
on life! The insights were profound, and I couldn't put it down!



ANY
VALUABLE
QUESTIONS

Prediction: happy

ANY
QUESTIONS