# PROG8850 - Database Automation- End-to-End Automated Database Management with Advanced Monitoring

Prepared by: Group 3  
Course: PROG8850 - DB Automation  
Date: 15 August 2025  
GitHub Repo: <https://github.com/TwinkleM97/Group3-FinalProject-DBAutomation>

# Introduction & Purpose

The objective of this project was to design, implement, and demonstrate a complete system for monitoring containerized database workloads using Signoz, while automating database setup and validation steps. Our group aimed to meet the requirements by covering both the infrastructure deployment and the collection of real-time performance metrics. This ensures observability, validation, and proper reporting of system behavior.

# Implementation & Setup

We began by setting up the required containers for MySQL and Signoz. The deployment steps involved running docker-compose files for both services, ensuring that all required containers started successfully, and confirming connectivity. Database creation, schema updates, data seeding, and validation queries were executed as part of the automation scripts.

A black screen with colorful text

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Figure: S01 MySQL Version

A computer screen with many white text

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Figure: S02 MySQL Running

A screenshot of a computer

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Figure: Schema And Rows

A screen shot of a computer

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Figure: Signoz Containers Up

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Figure: validatesql

# CPU Metrics

This section focuses exclusively on CPU-related metrics as collected from the Signoz dashboard. The screenshots display CPU utilization, CPU usage in seconds, user mode usage, kernel mode usage, total CPU time, and overall container CPU metrics.

A screen shot of a graph

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Figure: CPU-Utilization-Panel

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Figure: CPU-Usage-Seconds-Panel

A screenshot of a computer

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Figure: cpu-usage-usermode-metric

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Figure: cpu-usage-kernelmode-metric

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Figure: total-cpu-usage-metric

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Figure: container-cpu-metrics

# Logs, IO Wait, and Memory Usage

This section contains error logs, climate data logs, IO wait panel, and memory usage panel screenshots. These provide insights into application behavior, database activity, and resource utilization.

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Figure: error-general-log

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Figure: climateData-logs

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Figure: IO-wait-Panel

A screen shot of a graph

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Figure: Memory-Usage-Panel

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Figure: dashboard

A screen shot of a computer

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Figure: connections-panel

# Pipelines and Dashboard Views

This section contains screenshots showing successful pipeline executions, the monitoring dashboard overview, and the connections panel. These visuals demonstrate the CI/CD flow and general system status.

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Figure: pipeline-section1

A screenshot of a computer program

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Figure: pipeline-section2