Decoding Data Science(DDS) Academy

AI Application Building Challenge

For students (instructor review required)

# Day 1 Idea Submission Template

## Project Title:

AI-Driven Cloud Operations Monitor & Scaling Assistant

## Concept Summary:

(Briefly describe your idea, including its purpose and the problem it aims to solve.)

This project aims to make cloud operations smarter and more proactive. By integrating **LLM APIs** (OpenAI/Amazon Bedrock) with AWS CloudWatch and Auto Scaling, the application will **analyze logs and metrics, detect anomalies, summarize insights in natural language, and recommend or trigger scaling actions automatically**. The goal is to reduce manual monitoring effort and improve system reliability.

## Target Audience:

(Who will benefit from your project? Describe their needs.)

 CloudOps **and DevOps teams** managing AWS infrastructure.

 IT managers seeking **faster, actionable insights** from logs and metrics.

 Developers or SREs looking for **AI-assisted anomaly detection and scaling recommendations**.

## Key Features:

(List the main features or functionalities of your application.)

1. Automatic log and metrics analysis with LLM summarization.
2. Anomaly detection for critical events (CPU spikes, service failures).
3. Notification system via Slack/Teams/Email with actionable insights.
4. Optional automated scaling recommendations via AWS Auto Scaling.

Technical Approach:

(How do you plan to implement your idea? Mention technologies or methods.)

**Technical Approach:**

* **Data Source:** AWS CloudWatch logs & metrics.
* **Processing Layer:** Lambda functions or containerized pipeline to extract and pre-process data.
* **AI Layer:** LLM API (OpenAI GPT-4.1 / Amazon Bedrock) for natural language summarization & anomaly detection.
* **Notification Layer:** Slack/Teams integration via webhooks.
* **Optional Automation Layer:** Trigger AWS scaling policies or Terraform plan suggestions.
* **Tech Stack:** Python + Boto3, Terraform for IaC, Slack/Teams API.

## Expected Challenges:

(What potential obstacles do you foresee, and how will you address them?)

* **API rate limits or response times** → Mitigate with batching & caching.
* **Complex log patterns causing inaccurate summaries** → Tune prompts and pre-process data carefully.
* **Secure handling of credentials & sensitive data** → Use AWS Secrets Manager and environment variables.

## Submission Format:

(Outline how your submission should be presented: documents, slides, etc.)

* **Document:** PDF or Google Docs with project summary, architecture diagram, and approach.
* **Optional:** GitHub repo link containing code snippets, configuration, and demo instructions.

## Expected Outcome:

(What do you aim to achieve by the end of the challenge?)

* A working prototype demonstrating **AI-driven monitoring, anomaly detection, and actionable insights**.
* Demo-ready project for **GITEX Global showcase**.
* Resume-ready achievement: *“Built an AI-driven CloudOps pipeline integrating AWS CloudWatch with OpenAI API for intelligent monitoring and scaling recommendations.”*

## Additional Notes (Optional):

* The project can be extended in the future to support **multi-cloud environments**.
* UI/dashboard for visualizing summaries and insights can be added later.