# Project Name: E-Learning Platform with Auto Evaluation

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## Introduction

The E-Learning Platform with Auto Evaluation is designed to simplify and automate the process of assignment submissions and evaluations. Instead of relying on manual checking, this platform allows students to upload assignments, which are then automatically validated against predefined test cases.  
  
By combining structured data storage (scores in MySQL), unstructured data management (logs in DynamoDB), and modern DevOps practices (CI/CD, automated testing), the system ensures scalability, accuracy, and reliability. This solution enhances learning efficiency, reduces manual workload, and provides real-time feedback to students.

## Problem Statement

In traditional learning environments, assignments are uploaded and evaluated manually, which often leads to:  
- Delays in feedback.  
- Inconsistencies in evaluation.  
- Lack of transparency in test execution.  
- Limited scalability for large student batches.  
  
There is a need for an automated evaluation platform that not only validates assignments against predefined test cases but also maintains logs for debugging, ensures real-time feedback, and integrates with CI/CD pipelines for continuous improvement.

## Functional Requirements

* Assignment Upload: Students should be able to upload assignments through a Java-based API. Validation of file formats and submission rules must be enforced.
* Evaluation Engine: Automatically run test cases against submitted assignments. Generate scores and feedback based on results.
* Result Storage (MySQL): Store student scores and metadata in a relational database. Enable retrieval for future reports and analysis.
* Log Management (DynamoDB): Store unstructured logs such as runtime errors, system execution details, and debug information. Ensure logs are immutable for audit and debugging purposes.
* Data Structures for Performance: Use HashMap to efficiently manage and fetch scores in memory during evaluation.
* Behavior Driven Development (BDD): Define and test auto-evaluation scenarios using BDD frameworks for better coverage and clarity.
* DevOps Integration: Implement CI/CD pipelines to automate build, test execution, and deployment. Ensure that every submission triggers automated test runs.
* Demo Deployment: Deploy the application in a demo environment for showcasing end-to-end functionality.

## Non-Functional Requirements

* Security: Encrypt sensitive student data in storage and transit. Restrict access to evaluation logs.
* Performance: Support fast upload and immediate evaluation. Ensure logs are recorded without delay.
* Reliability: Guarantee accuracy in evaluation through deterministic test case execution. Ensure no data loss during storage in MySQL or DynamoDB.
* Scalability: Handle increasing numbers of students, assignments, and evaluations seamlessly.
* Usability: Provide a simple interface for students to upload assignments. Allow administrators to view results, logs, and reports with minimal effort.
* Compliance: Maintain logs for required durations to support academic audits. Adhere to standard practices in data storage and evaluation transparency.

## Final Note

This project will deliver a modern, scalable, and automated E-Learning platform that integrates assignment uploads, automated evaluations, structured/unstructured data management, and DevOps practices to ensure efficiency, accuracy, and transparency.