**Due: (End of Module 5)**

**Brief for Level 5 Data Engineer - Portfolio Piece 2**

**"Problem solving and continuous improvement"**

**Word count:** up to 2,000 words (+/- 10%)

**Objective:** *Demonstrate problem solving and a reflection on continuous improvement by applying core concepts and practical skills learned so far.*

**Deliverables:** *Submit at least* ***three items of evidence****to support your work, including* ***screenshots****and brief explanations for each. Submit via the Hub by the deadline at the top of the document.*

**Task Breakdown:**

For this portfolio piece, you will take the feedback from your second formative, embed those into your work, while also expanding on the problem in further detail. You are welcome to choose a different example should you feel it offers a more interesting discussion.

Your approach this time should frame the problem as a project: What was the problem? How did you plan to rectify the issue? Did you solve it? What were the repercussions?

Please note the change in word count, an additional piece of evidence required, and an updated **‘Guidelines for Writing the Reflection’** has been provided at the end of this document to help you further reflect on this task.

**Reminder of Formative 2**

Reflect on a time when you encountered a challenge as a data engineer. This could relate to a technical failure, an operational inefficiency, a risk or security issue, a need for optimisation, or the adoption of a new tool or technology. This need not be something you have completed but could be a proposal of an idea you have. Note that this needs to be original work i.e. you cannot outline a project undertaken by someone else. You may have completed this work as part of a team.

Your reflection should analyse the problem-solving process you followed, how you applied continuous improvement principles, and the lessons learned from the experience.

The final submission should be structured, covering technical, strategic, and best-practice considerations, and should demonstrate your role in driving improvement within data engineering processes.

Your reflection should demonstrate how you:

1. **Identified and Managed Risks & Incidents**
   * Describe the issue or risk that arose, how it was identified, and any early warning signs.
   * Explain how you assessed its potential operational impact and followed escalation and communication procedures to ensure business continuity.
   * Reflect on any monitoring tools or policies that supported your response.
2. **Investigated Root Causes & Provided Resolutions**
   * Outline how you analysed the root cause of the issue, and the methods/tools used for investigation.
   * Describe the troubleshooting process and how you collaborated with stakeholders to implement a solution.
   * Evaluate how effective your response and resolution were, and any feedback received.
3. **Applied Continuous Improvement Principles**
   * Explain how this experience helped you identify inefficiencies, technical debt, or areas for enhancement.
   * Discuss any process or system improvements you recommended and the rationale behind them.
   * Reflect on how you used peer review, best practices, or automation to ensure quality and innovation.
4. **Evaluated Data Value, Sustainability & New Technologies**
   * Consider how the issue prompted a review of data value extraction (e.g., optimising existing data products).
   * If applicable, reflect on whether the challenge led to exploring cost reduction, environmental impact, or system efficiency improvements.
   * Discuss any new technologies, frameworks, or methodologies you considered implementing as a result.
5. **Advocated for Best Practices in Technology & Development**
   * Reflect on how the experience reinforced the importance of software development principles in data engineering.
   * Describe any lessons learned about adopting best practices in data pipeline management, system architecture, or tooling.
   * Consider how this influenced your approach to collaborating with data scientists, analysts, or developers.

**Guidelines for Writing the Reflection**

* **Executive Summary:** A concise overview of the entire project, highlighting key findings, conclusions, and recommendations.
* **Introduction:** Provide context about the challenge or opportunity you faced.
* **Methodology:** Details the methods, tools, and procedures used to conduct the project, including data collection and analysis techniques.
* **Results/Findings:** Presents the data and key observations gathered during the project, often accompanied by tables, graphs, and figures.
* **Conclusion:** Summarise key learnings, changes in approach, and recommendations for future improvements.
* **Recommendations:** Suggests actionable steps based on the project findings, including potential improvements or future research directions.

**Assessment Criteria:**

* Clear articulation of problem-solving methods.
* Evidence of best-practice application.
* Use of unique examples and critical reflection.
* Consideration of continuous improvement and innovation.

**Submission Requirements:**

* Submit your work in a single PDF or Word document.
* Caption and number each screenshot (For example: Fig. 1 - My important image) and then refer to your numbered screenshots to explain the actions taken (for example "As seen in Fig. 1, I have...").
* Save this document both in your learning journal and on the Hub.