Sample Assessment Brief: full unit

NCFE Level 5 Diploma: Data Engineer
QN: 610/5972/9
Unit 01 Data engineering principles and foundations (K/651/6932)

Student name / ID number	
Unit number, title and learning outcomes (LOs)	**Full unit sample assessment** **Unit 01** Data engineering principles and foundations (K/651/6932) **LO1**: Explore the principles of data **LO2**: Explore the concepts of data governance **LO3**: Explore and apply the principles of data normalisation and redundancy in relational databases **LO4**: Explore approaches to data integration **LO5**: Explore the unique features and functions of different data formats **LO6**: Explore common data development frameworks and architectures
Assignment title	Data Engineering Portfolio

Scenario

You are working as a data engineer at a company that is trying to improve how it collects, stores, and manages data. As part of your annual appraisal, you have been asked to provide evidence of your work for the year. Create a portfolio that demonstrates your understanding of data engineering foundations so your company can assess your readiness to lead the team's project.

Tasks

Task 1: written report

As part of the portfolio, create a written report that gives an overview of data engineering. Include sections that:

- describe the key principles of data management, including lawfulness, accuracy, transparency, and accountability.
- explain the use of external data sources to support internal data and business operations.
- describe data governance concepts such as privacy, metadata, ownership, and quality control.
- identify regulatory and legislative standards that influence data management, such as GDPR and the Digital Economy Act
- analyse different types of external data sources and their potential benefits.
- analyse how data governance practices operate within an organisation.
- evaluate how direct data acquisition can improve operations in a real-world scenario
- evaluate how data governance practices shape organisational policies and processes.

Task 2: simulated data governance concerns

The company want to ensure their data meets specific governance standards. They have arranged a meeting to outline their concerns and sent through a list of requirements they wish to discuss:

- correct access controls
- compliance with GDPR and Data Protection
- ensuring that the data remains safe and secure.

Meet with the company to explain how you could check and ensure that their requirements are being met

Task 3: database demo (screenshots or SQL scripts) and written analysis

You have been given an aptitude test as part of the application process for project lead. For the test, you have been provided with a database in a raw format.

You need to normalise the database to at least 3 normal form (NF) and ensure all redundant data is removed, and analyse how this supports protection, the structure and efficiency of the database by removing redundant data.

You are then expected to evidence a range of database queries and validation checks, considering user access controls using SQL and Python.

Evidence the use of different types of secure data stores, such as SQL or similar

Evaluate how different access controls and validation checks help maintain a secure operational database.

Task 4: technical report

Create a technical report that:

- describes different approaches to integrating data
- explains the characteristics of common data storage formats
- analyses a selection of data integration approaches including examples of where they could be used to support organisational objectives
- compares different data storage solutions against a range of different data formats

Task 5: case study or written evaluation of frameworks and architectures

The company are unsure of their options, so provide a document that gives a description of commonly used data development frameworks (for example, Apache Airflow or Apache Spark) and how they integrate with different data architectures, such as cloud and on premises.

The document should also:

- analyse how infrastructure influences framework choice and implementation
- evaluate how that choice affects scalability, performance, and cost-effectiveness.

Evidence requirements

Task 1 - written report.

Task 2 - data store evidence.

Task 3 - database demo (screenshots or SQL scripts) and written analysis. Task 4 - technical report on integration methods and data formats. Task 5 - case study or written evaluation of frameworks and architectures.
Unit learning outcomes (LOs)
LO1: Explore the principles of data **LO2**: Explore the concepts of data governance **LO3**: Explore and apply the principles of data normalisation and redundancy in relational databases **LO4**: Explore approaches to data integration **LO5**: Explore the unique features and functions of different data formats **LO6**: Explore common data development frameworks and architectures

Grading criteria

Unit 01 Data engineering principles and foundations (K/651/6932)

Learning outcomes (LOs)	Pass	Merit	Distinction
LO1: Explore the principles of data	**P1**: describe key principles of data management **P2**: explain how external data sources can affect business operations	**M1**: analyse different types of external data sources	**D1**: evaluate the use of direct data acquisition in business operations
LO2: Explore the concepts of data governance	**P3**: describe core data governance concepts **P4**: identify regulatory and legislative standards influencing data management within an organisation **P5**: evidence stakeholder collaboration to satisfy specific requirements	**M2**: analyse the role of data governance within organisations	**D2**: evaluate how data governance can impact organisational policies
LO3: Explore and apply the principles of data normalisation and redundancy in relational databases	**P6**: apply the principles of database normalisation to reduce data redundancy **P7**: perform database queries and validation checks considering user access control	**M3**: analyse how normalisation supports key concepts of database performance and the removal of duplicate data	**D3**: evaluate the effectiveness of access controls and validation checks when maintaining a secure operational database
LO4: Explore approaches to data integration	**P8**: describe different approaches to integrate data	**M4**: analyse approaches to the integration of disparate data sources and the need for this to support business outcomes	
LO5: Explore the unique features and functions of	**P9**: explain characteristics of common data and storage formats	**M5**: compare how different data storage solutions meet the	

Learning outcomes (LOs)	Pass	Merit	Distinction
different data formats	**P10**: evidence the use of different types of secure data stores, such as SQL or similar	requirements of various data formats and uses	
LO6: Explore common data development frameworks and architectures	**P11**: describe data development frameworks and their integration within different architectural models	**M6**: analyse how organisational infrastructure affects the selection and implementation of data frameworks and architectures	**D4**: evaluate how the choice of development frameworks and architecture impacts scalability, performance, and cost-effectiveness of a data solution