Question 1: Data Modelling

• Provide an Entity Relationship Diagram (ERD). For each entity, provide at

least one attribute/ field with a maximum of two attributes (excluding primary

key).

• Provide a Relational Model and show the most appropriate attributes/ fields,

primary keys, and foreign keys. In addition, include the data type for each

attribute/ field listed in each table/ entity.

• You should apply the third normal form (3NF) and show consistency in the

use of notation.

• If you discover while drawing the diagrams that the narrative of the case study

is incomplete, then provide justifications, assumptions, or reasonable

explanations to complete the case study along with your diagrams. You could

include the justifications, assumptions, or reasonable explanations under the

Appendix section.

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Question 2: SQL Scripts

• Based on data modelling from Question 1, create 3 queries that have the

following requirements. Note that each of the query can cover one or more of

the requirements.

o One of the 3 queries should have a calculation.

o One of the 3 queries should make use of Group By.

o One of the 3 queries should include a scalar function (one that returns

a value).

o One of the 3 queries should demonstrate Nested Query (could be

either standard or correlated sub-query).

o One of the 3 queries should demonstrate joining tables.

o One of the 3 queries should demonstrate the creation and testing of

Trigger with test data.

• For each query,

o Explain and justify its business purpose and business value or impact.

o Provide the SQL script.

o Explain the design of SQL script.

o Make use of a table(s) with sample data to show the potential result/

outcome of the query.

Question 3: Data Analytics with Orange

After you have dealt with the missing values, discuss how you would predict the

spending score of customers for Costello Pty. Ltd. using the knowledge of data

visualisation and regression. In your explanations, include the screenshots of using

Orange to produce the visualisation and prediction model. In addition, please explain

how your results from data visualisation and regression could help Costello Pty. Ltd.

expand its business.

Question 4: Database Administration Approaches

Describe two potential impacts on Costello Pty. Ltd. if data is not appropriately

protected. For each type of impact, discuss a recommended security feature of a

database management system that Costello Pty. Ltd. can use to protect its data.

Question 5: Big Data and Analytics

Suggest two applications of big data and analytics that can improve Costello Pty.

Ltd. in understanding its business. Discuss the benefits where each of the

suggested application would deliver to the company