School of Computing
Data Management Referral / Deferral Coursework (2023-24)

Module Code	M26489
Module Title	Data Management
Module Coordinator Other lecturers	Dr Olumuyiwa Matthew <olumuyiwa.matthew@port.ac.uk>
Assessment Item number	Single Item
Assessment Title	Set Exercise
Date Issued	2024-07-08

Schedule and Deliverables

Deliverable	Value	Format	Deadline / Date
Single Item – PMM Grocery Supermarket Case Study – Set Exercise	100%	Txt/sql/doc/PDF submitted on Moodle, Individual	2024-07-26 by 16:00 Friday 26th July, 2024 – 4pm

Notes and Advice

- The Extenuating Circumstances procedure is there to support you if you have had any circumstances (problems) that have been serious or significant enough to prevent you from attending, completing or submitting an assessment on time. If you complete an Extenuating Circumstances Form (ECF) for this assessment, it is important that you use the correct module code, item number and deadline (not the late deadline) given above.
- ASDAC are available to any students who disclose a disability or require additional support for their academic studies with a good set of resources on the ASDAC Moodle site
- The University takes any form of academic misconduct (such as plagiarism or cheating) seriously, so please make sure your work is your own. Please ensure you adhere to our *Code of Student Behaviour* and watch the video on Plagiarism.
- Any material included in your coursework should be TECFAC 08 Plagiarism fully cited and referenced in **APA 7** format. Detailed advice on referencing is available from the library .

- Any material submitted that does not meet format or submission guidelines, or falls outside of the submission deadline could be subject to a cap on your overall result or disqualification entirely.
- If you need additional assistance, you can ask your personal tutor, student engagement officer ana.baker@port.ac.uk, academic tutor xia.han@port.ac.uk or your lecturers.
- If you are concerned about your mental well-being, please contact our Well-being service.

The portfolio for item 1 is made up of one component:

Type	**Percentage**
Assessment (single course) – PMM Grocery Supermarket Case Study – set exercise Individual	100%

Submit via Moodle

Assessment

Hand in: Set Exercise – Friday 26th July 2024 – 4pm
Individual Attempt

You are required to develop a relational database solution for PMM Grocery Supermarket to store all details and every element within the organization.

CASE BRIEF: PMM Grocery Supermarket

PMM Grocery Supermarket has decided to move from manual ways of doing things into digitalize method of operation. They require a new database management system to replace the original system they had in place as this is no longer viable for the amount of data they are storing. They would like a design for a centralised database that allows web interface access for the employees and customers.

PMM Grocery Supermarket is an Hampshire supermarket with branches in Waterlooville, Fareham, Gosport, Havant, Chichester with Portsmouth as the head office.

Staff work in different locations based on the shift pattern and each location have a manager who oversees the affairs of the the location. And store manager will report to the headoffice.

PMM Grocery Supermarket sells products under different categories like beverages, bread/bakery, Canned/Jarred goods, Dairy, Dry/baking goods, frozenfoods, meats, produce, cleaners, personal care, paper goods etc. And each product will have details

like product price, product Id, product name, ingredients, allergy advice, lifestyle, size/volume, net weight, direction for use, nutrition info, country of origin, storage instruction and maunfacturer.

Example of a details –

Product Name – Sliced Malted Bloomer Bread

Product Price - £1.35

Product Id – 4088600412177

Ingredients - **Wheat Flour** (**Wheat Flour**, Calcium Carbonate, Iron, Niacin, Thiamin), Water, Malted **Wheat** (6%), Yeast, **Rye** Flour, Rapeseed Oil, Salt, **Wheat** Bran, **Wheat** Semolina, Malted **Barley** Flour, Preservative: Calcium Propionate; Flour Treatment Agent: Ascorbic Acid.

Net Weight – 800g

Lifestyle - Vegetarian

Nutrition Info. - Per 100g: Energy 1064kJ, 251kcal Fat 1.7g of which saturates 0.2g Carbohydrate 48g of which sugars 4.9g Fibre 4.1g Protein 8.5g Salt 0.87g

Storage Instructions - Store in a cool, dry place away from strong odours and direct sunlight. Once opened, store in an airtight container. Suitable for freezing. Freeze by date mark shown and use within one month. Defrost thoroughly before use. Do not refreeze once defrosted.

Customers can make order at the store or online. Customers can register to create individual account with PMM Grocery Supermarket. The details of order made by each customer should be stored and such information can be retrieved at any time even after the transaction are completed.

PMM Grocery Supermarket need to be able to run regular reports on their database to ensure they are able to run a successful business.

Typical reports:

- Basic stats on customers per city for a specific time period
- All products with details and prices
- Order record and delivery details.
- Report of product availability and their location
- Monthly income generated per city/location

You are a junior database administrator (DBA) working for a Systems Development company and have been in post approximately 9 months. During this time, you have been

working on existing database systems that have been developed by the Company's Senior DBA. (You can assume that Olumuyiwa and the teaching team would have this role.)

One of the Company's clients has asked for a system to be developed for them (see above case study). **The Senior DBA does not have the time to devote to this project yet and so has asked you to work out the design, development and justification.** Therefore, the work you produce is for a Senior DBA – to save them thinking time when starting the project – and as such you can assume they understand more about databases than you do. Your report should take this into account and you should not describe or explain topics that the Senior DBA already knows but you should analyse their importance and relevance in the given scenario.

Task T1: SQL Queries (45 marks)

Create and populate a working relational database for the given case study using Postgres. You should take on board corrections from your first attempt to perfect your database.

Write FIVE SQL statements that reflect the needs of the business. These statements should include some of the more complex SQL syntax you have learned this year.

You will be required to run your queries and submit the screenshot of both the queries and their outputs.

The marking will be for:

- The level of complexity of each query,
- The query being of use to the business,
- Good input and output formatting,
- Good design (relating back to the EERD & Data Dictionary in your 1st attempt),
- Use of any feedback you have received about your design – not compulsory
- Use of additional features such as constraints etc.,
- Good differentiation among your queries

Task T2: Database / record Development (20 marks)

Create a NoSQL, (MongoDB) database that will store products and their corresponding details. You can generate random products and their details using any free online data generating platform or you create your own. You will require to a minimum of 100 products in your database. Each product will need to be stored as a single record in a single collection in the database. You will need to provide the code that you used to create the database and store the records. This will allow you to create the 5 queries needed for your task 3.

Task T3: Queries (25 marks)

Write 5 queries that will retrieve product information from your database. Think of the sort or things that a user will want to be able to do. For example, a user might:

- Look for products for specific season with specific composition and description.
- Product availability and locations.
- History of delivery of orders.
- Products purchasing record based on the locations.

Task T4: Reflective Report (300-400 words) (10 marks)

Write a reflective report on how you have developed the database, how you collaborate with your group member and how you chose the queries.

Marking Scheme

T1: Queries and screenshots (45 marks) – (Using Postgres only)

At the top-level students will have produced a full set of working tables that have correct PK & FK, constraints, correct data types, sizes and domains. The data entered will be of relevance and use when implementing the queries. The queries will contain relevant SQL code and show that the student has grasped some of the more complex SQL syntax.

For each query (5x 7 marks)

- *The level of complexity of the query.*
- *The query being of good business use.*
- *Good differentiation from other queries.*
- *Good input and output formatting.*
- *Good design (relating back to the EERD & Data Dictionary).*
- *Use of any feedback received.*
- *Use of additional features such as constraints etc(5marks).*

T2: Database / record Development (20 marks)

- 16 - 20 marks: sensible record structure that provides a good understanding of the JSON structures. Consistent use of a suitable structure for each record
- 7 - 15 marks: some consideration of the JSON structure used but some inconsistencies across the records in the database.
- 0 - 6 marks: little or no consideration of proper JSON structures.
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T3: Queries (25 marks)

- For each query (5 x 5 marks) depending on:
- The level of complexity of the query.
- The query use of the query to an end user.

- Good differentiation from other queries.

T3: Reflective Report (10 marks)

- 7–10 marks: a good reflection, relating the development of the coursework and the student's learning.
- 4-6 marks: a fair reflection with limited coverage on development of coursework and student's learning process.
- 0–3 marks: trite, weak or no reflection.