Assessment Brief: BIS1002 Data and Information Management

Trimester-1 2023

Assessment Overview

Assessment Task	Type	Weighting	Due	Length	ULO
Assessment 1: Database Interrogation Practical exercises assess students' ability to apply theoretical learning to practical, real world situations on a weekly basis.	Individual  Invigilated 	40%	Weeks 2, 4, 6, 8, 10	2500 words	ULO-1 ULO-2 ULO-3 ULO-4
Assessment 2: Applied Project -1 Design a relational database system for a specify organization. The design covers ERD, modelling the rules of organisation, entities and attributes and relationships.	Individual 	30%	Week 7	2500 words	ULO-1 ULO-2 ULO-3
Assessment 3: Applied Project – 2 Design and implement and physical data-based system according to specified requirements. The design convers the process of logical and physical design. The students have to implement the proposed design and demonstrate the use of SQL language.	Group 	30%	Week 12	2500 words	ULO-1 ULO-2 ULO-3 ULO-4

Assessment 1: Database Interrogation

Due date:	Weeks 2, 4, 6, 8, 10
Group/individual:	Individual
Word count / Time provided:	2500 words
Weighting:	40%
Unit Learning Outcomes:	ULO-1, ULO-2, ULO-3, ULO-4

Assessment Details:

Database Interrogation are practical exercises that assess students' ability to apply theoretical learning to practical database questions. This assessment will improve student's ability to design databases and write SQL queries.

Students will not be assessed on work that the tutor has not seen them produce in class so that attendance is required as part of this assessment. Students are required to submit the work that they have completed during the lab session. The details of the lab work and requirements are provided on the online learning system.

Marking Information: The assessments will be marked out of 100 and will be weighted 40% of the total unit mark.

Assessment 2: Applied Project-1

Due date:	Week 7
Group/individual:	Individual
Word count / Time provided:	2500 words
Weighting:	30%
Unit Learning Outcomes:	ULO-1, ULO-2, ULO-3

Assessment Details:

The ABC Consulting IT company specialises on Mobile Application development for businesses. The company needs a database to store information about projects and employees working on the projects. Your task is to design a relational database and create SQL queries to create and populate the tables.

The database requirements contain the following information:

- **Employees** working on the projects are divided into two categories: **Developers** and **Development Managers**.
- **Developers** are working in **Teams**.
- Each **Development Manager** manages at least one **Team**.
- Each **Team** works on at least one **Project**.
- At least one **Team** works on a **Project**.
- The following general information is stored for each **Employee**: ***ID***, ***Name*** and ***Salary.***
- The **Developer** additional attributes are **Position** and **Skill** (not multivalued).
- The **Development Manager** additional attribute is a ***Product Type***.
- The **Teams** attributes are ***Team ID***, ***team name*** and ***team start date***.
- One of the team members (**Developers**) is also a team leader. This information must also be stored in the database.
- The **Project** attributes are ***Project ID***, ***Project Name***, **Start Date** and **End Date**.

- **HoursWorked** is an association between **Project** and **Developer,** and it is a number of hours a **Developer** spent working on a **Project.**

You must submit your assignment as a MS Word document. The diagrams must be drawn using app.diagrams.net online tool, saved as .png or .jpg file and inserted in the Word assignment document.

Don't forget to include the assignment cover sheet!!!

Part 1. Conceptual Model

Please remember that the Enhanced Entity-Relationship diagram is only a part of your assignment. You need to ***describe*** the Conceptual Model, which must include the following elements:

- Entities and their attributes. For each entity you must also specify unique identifier attribute(s)
- Entity supertypes and subtypes. Describe inheritance types and the corresponding discriminators.
- Identify multi-valued and composite attributes (if any). In this case, they need to be shown in the ER diagram with the corresponding notations.
- Describe relationships between entities and their cardinalities. Remember that relationships can be one-to-one, one-to-many, many-to-many, and also optional or mandatory
- Draw the Conceptual Model Enhanced Entity-Relationship diagram using app.diagrams.net tool, save it as .png or .jpg file and insert it in the Word document

Part 2. Logical Model

Describe the algorithm of converting the Conceptual Model into the Logical Model. Your description should include the following elements:

- Entities in the Conceptual Model become relations (tables) in the Logical Model, and unique identifiers become primary keys.
- For one-to-one or one-to-many relationship between two entities you will need to create a foreign key in one of the relations (tables).
- If there is a many-to-many relationship between two entities, then you will need to create a new relation (table) with a composite primary key
- For each field (column) in a relation, describe a data type (integer, float, character, text etc.)
- If an entity contains a multi-valued attribute, then you will need to create a new relation in the Logical Model corresponding to this attribute.

- Draw the Logical Model diagram using app.diagrams.net tool, save it as .png or .jpg file and insert it in the Word document

Part 3. Create and populate the database.

The SQL queries below can be written in MySQL, MS Access or SQLite databases.

- Write SQL queries to create each table. The queries should contain creation of primary and foreign (if applicable) keys.
- Write SQL queries to populate the tables. Each table should contain two or more records.
- Make screenshots of the development environment you worked with and insert the images in the assignment file.
- Copy the SQL queries in the assignment document.

Marking Information: The assessments will be marked out of 100 and will be weighted 30% of the total unit mark.

Marking Criteria	Not satisfactory (0-49%) of the criterion mark)	Satisfactory (50-64%) of the criterion mark	Good (65-74%) of the criterion mark	Very Good (75-84%) of the criterion mark	Excellent (85-100%) of the criterion mark
Demonstrate an understanding and describe the Conceptual Model design processes (20%)	Inadequate understanding and describing Conceptual Model design process	Basic knowledge only of understanding and describing Conceptual Model design process	Exhibits breadth and depth of understanding and describing Conceptual Model design process	Exhibits accurate and detailed breadth and depth of understanding and describing Conceptual Model design process	Displays exceptional understanding of concepts and their practical application in Conceptual Model design process
Demonstrate an understanding and describe the Logical Model design processes (20%)	Inadequate understanding and describing Logical Model design process	Basic knowledge only of understanding and describing Conceptual Model design process	Exhibits breadth and depth of understanding and describing Conceptual Model design process	Exhibits accurate and detailed breadth and depth of understanding and describing Conceptual Model design process	Displays exceptional understanding of concepts and their practical application in Conceptual Model design process
Demonstrate understanding and	Inadequate understanding	Basic understanding	Exhibits breadth and depth of	Exhibits accurate and	Displays exceptional

skills of creating the Conceptual Model diagram (25%)	and skills of creating the Conceptual Model diagram	and skills of creating the Conceptual Model diagram	understanding and skills of creating the Conceptual Model diagram	detailed breadth and depth of understanding and skills of creating the Conceptual Model diagram	understanding and skills of creating the Conceptual Model diagram
Demonstrate understanding and skills of creating the Logical model diagram (25%)	Inadequate understanding and skills of creating the Logical Model diagram	Basic understanding and skills of creating the Logical Model diagram	Exhibits breadth and depth of understanding and skills of creating the Logical Model diagram	Exhibits accurate and detailed breadth and depth of understanding and skills of creating the Logical Model diagram	Displays exceptional understanding and skills of creating the Logical Model diagram
Demonstrate SQL query writing skills to create and populate tables (10%)	Inadequate SQL query writing skills	Basic SQL query writing skills	Exhibits breadth and depth of understanding of SQL query writing skills	Exhibits accurate and detailed breadth and depth of understanding and skills of SQL query writing	Displays exceptional understanding and skills of SQL query writing

Assessment 3: Applied Project-2

Due date:	Week 12
Group/individual:	Group
Word count / Time provided:	2500 words
Weighting:	30%
Unit Learning Outcomes:	ULO-1, ULO-2, ULO-3, ULO-4

The Global Trading company sells building and gardening tools. It has sales offices and warehouses all over Australia. The company developed a data warehouse to store information about sales, customers and products. These data are stored in the AppliedProject2 SQLite database file provided for you.

The database consists of 6 tables:

- CompanyDim – with the sales office address, state, and email
- ProductDim – product information
- WarehouseDim – warehouse locations
- CustomerDim – information about customers
- DateDim – sales dates
- SaleFacts – information about sales

Please notice that data (customers, sales, dates, warehouses, and products) are randomly generated. Table and field names are self-explanatory.

The company wants to retrieve information from the database for reporting and data analysis. To get the data, a database analyst writes SQL queries.

Your assignment consists of the following tasks:

1. In the MS Word document:
   1.1. Identify dimension and fact tables. (Remember that the database structure is a database star schema).
   1.2. Analyse and describe the tables (fields, field datatypes, primary and foreign keys).
   1.3. Draw the database diagram.
   1.4. Copy all queries you wrote in the SQLite Browser to the Word document and explain them.

2. In the SQLite Browser, you need to write, save, and run the following **SQL queries**:
   2.1. Open the 'AppliedProject2.db' database and save it as a project.
   2.2. Create and run the queries to create primary and foreign keys. Save the queries in the project.
   2.3. Insert a new product.
   2.4. Create a new sale fact related to the new product. You can choose any existing customer, warehouse, date and sales office.
   2.5. For all company branches (CompanyDim table) display branch addresses, emails and states.
   2.6. Display all customer names from Queensland.
   2.7. Display the total amount of sales for all companies in 2016.
   2.8. Display total amount of sales for each company branch separately.
   2.9. Display total amount of sales for each product and state separately, i.e. the output should contain 3 columns: product, state and total amount for this product and state.
   2.10. Display products sold from warehouses located in New South Wales.
   2.11. For each sale, display a customer name and a purchase date.
   2.12. Display a total number of sales (NOT AMOUNT in $) for each customer.
   2.13. For each sales office (branch), display: branchKey, branch state, a customer name (a customer purchased in this office), a product name purchased by this customer, and a month number of the purchase.
   2.14. Calculate a number (not amount in $) of sales in the second quarter of 2018.
   2.15. Display the following sale information: Office branchAddress, customerName, productName, WarehouseDivision, SaleDate for all offices in Victoria and between 20 January 2017 and 15 May 2017.

Your submission should consist of the following documents:

- MS Word document containing answers to the Task 1
- SQLite Browser project file with stored **SQL queries** from the Task 2

- The AppliedProject2.db SQLite database with created primary and foreign keys.

You will lose marks for not submitting any of the above files.

Don't forget to include the assignment cover sheet !!!

Marking Criteria and Rubric: The assessment will be marked out of 100 and will be weighted 30% of the total unit mark

Marking Criteria	Not satisfactory (0-49%) of the criterion mark)	Satisfactory (50-64%) of the criterion mark	Good (65-74%) of the criterion mark	Very Good (75-84%) of the criterion mark	Excellent (85-100%) of the criterion mark
Demonstrate understanding of database design and ability to draw database diagrams (20%)	Inadequate understanding of database design and database diagrams.	Basic knowledge only of understanding and of database design and database diagrams.	Exhibits breadth and depth of understanding of database design and database diagrams.	Exhibits accurate and detailed breadth and depth of understanding of database design and database diagrams.	Displays exceptional understanding of database design and database diagrams.
Demonstrate understanding of database primary and foreign keys, and database referential integrity. (10%)	Inadequate understanding of database primary and foreign keys, and database referential integrity.	Basic knowledge only of understanding of database primary and foreign keys, and database referential integrity.	Exhibits breadth and depth of understanding of database primary and foreign keys, and database referential integrity.	Exhibits accurate and detailed breadth and depth of understanding of database primary and foreign keys, and database referential integrity.	Displays exceptional understanding of database primary and foreign keys, and database referential integrity.
Demonstrate an understanding and ability to write and run simple SQL DDL and DML queries (20%)	Inadequate understanding and ability to write and run simple SQL DDL and DML queries	Basic knowledge only of understanding and ability to write and run simple SQL DDL and DML queries	Exhibits breadth and depth of understanding and ability to write and run simple SQL DDL and DML queries	Exhibits accurate and detailed breadth and depth of and ability to write and run simple SQL DDL and DML queries	Displays exceptional understanding and ability to write and run simple SQL DDL and DML queries
Demonstrate understanding and skills of writing	Inadequate understanding and skills of	Basic understanding and skills of	Exhibits breadth and depth of understanding	Exhibits accurate and detailed breadth	Displays exceptional understanding

advanced SQL queries, including table joins, functions and aliases. (30%)	writing advanced SQL queries, including table joins, functions and aliases.	writing advanced SQL queries, including table joins, functions and aliases.	and skills of writing advanced SQL queries, including table joins, functions and aliases.	and depth of understanding and skills of writing advanced SQL queries, including table joins, functions and aliases.	and skills of writing advanced SQL queries, including table joins, functions and aliases.
Demonstrate document and SQL query writing skills (20%)	Inadequate document and SQL writing skills	Basic document and SQL writing skills	Exhibits breadth and depth of document and SQL writing skills	Exhibits accurate and detailed breadth and depth of document and SQL writing skills	Displays exceptional document and SQL writing skills