



DATABASES

October 2024 - February 2025

SCHOOL OF INFOCOMM TECHNOLOGY

Diploma in Information Technology

Diploma in Data Science

Databases Assignment (40 % of DB Module)

06 Jan 2025 – 02 Feb 2025
(Week 13 to Week 16)

Deliverables	Deadline	Submission
Checkpoint 1 (Softcopy)	Wednesday 15 Jan 2025, 23:59 pm (NO LATE SUBMISSION WILL BE ACCEPTED)	BrightSpace Assignment / Checkpoint 1 Submission Link
Final (Softcopy)	Sunday 02 Feb 2025, 23:59 pm	BrightSpace Assignment / Final Submission link
Final (Hardcopy)	Monday 03 Feb 2025, 17:00 pm	Blk 31 Level 8 (Admin Office), Pigeon-holes (Databases)

Penalty for late submission:

10% of the marks will be deducted for everyday (inclusive of Saturdays, Sundays and public holidays) after the deadline.

NO submission will be accepted after **07 Feb 2025, 23:59 pm**.

This assessment hand-out consists of **14** pages (including this cover page and appendices).

DB ASSIGNMENT (WEEK 13 TO WEEK 16)

1. OBJECTIVES

This assignment assesses the student's ability to:

- (i) demonstrate the importance of database design and understanding of conceptual data model to support business processes and operations
- (ii) apply the understanding of database design techniques and conceptual data model for a business domain application
- (iii) perform the process of mapping of the conceptual data model into a logical model using relational methodologies and concepts
- (iv) construct and populate the physical database tables with appropriate constraints taken from the logical data model
- (v) demonstrate how business requirements are met through formulating SQL queries.

2. SCOPE

You are required to work in teams for this assessment. Each team should have 4 to 5 members. You should treat this assignment as a consulting project carried out by a team of consultants for a business.

MokeSell is a new online platform which lets its users buy and sell new and second-hand goods. The **case information (Appendix D)** describes the setting of the database to support the online shopping system for MokeSell which your team has been tasked to develop. MokeSell has also provided an **ER model (Appendix C)** for your team.

Your team will design and implement a database to realise the implementation of the online shopping system for MokeSell. To help you design the database for MokeSell, your team is expected to explore the major online consumer-to-consumer shopping websites and apps to understand the necessary features, functions, and data requirements of the system. While the case information in the appendix spells out certain specific requirements for MokeSell, your team is expected to brainstorm and come up with brief but accurate details of the data requirements of the system.

Although all teams are assigned the same scenario, the quality of your assignment will be reflected in your team's effort and ability to analyse the details of the online shopping system for MokeSell, in terms of the comprehensiveness of features, functions and data requirements.

There is one checkpoint in this part of the assessment. The deliverables and expectations of the checkpoint are described below.

3. DELIVERABLES (60% TEAM)

Each team is required to submit a single team report which is divided into 2 submissions:

3.1. Checkpoint 1 submission

With the ER model given by MokeSell, your team is then ready to move on to the Logical Database Design stage. In this Checkpoint 1 submission, your team is required to submit the mapped Relations (Logical Design).

Checkpoint report should include the following:

- (i) List of mapped Relations (Logical Design)

You are to review the given ER model. If necessary, you may either:

- add new attributes to the given entities;

Note: You are NOT allowed to:

- add new entities or relationships to the model;
- modify the cardinality ratios of the relationships;
- modify the name of any entities, attributes and relationships in the given model.

3.2. Final submission

In the final stage of developing the database, your team is to perform the Physical Database Design and database implementation.

Your team is required to submit a report and do a presentation-cum-demo to the business owner and his IT Manager (both roles to be played by your tutor).

Your report should address two key aspects, namely:

- (i) To demonstrate the activities involved in the database design process through the **mapped relations** and **data dictionary** of the mapped relations, and
- (ii) To **create the database and load the resulting tables with data** to support your organisation's business information requirements through queries.

For this final submission,

a) Each student should provide 3 queries:

- these queries should be unique, i.e. students in a team should not have exactly the same query
- these queries should be non-trivial, i.e. they should involve at least two entities (tables) and meet one of the following criteria:
 - Utilises at least a scalar or aggregate function
 - Utilises the GROUP BY clause
 - Utilises a Sub Query
 - A combination of the above
- technically trivial queries are those that involve retrieving information from only one entity (table) without complicated functions or search conditions, although such queries may not be trivial from the business point of view.

Final report should include the following:

- (i) List of mapped Relations (Logical Design), highlighting any changes made to it or additional assumptions since Checkpoint 1 submission
- (ii) Data Dictionary (Physical Design)
- (iii) Listing of SQL statements showing the tables creation and insertion of tuples (Setup document)
- (iv) Content of all the tables (SELECT * FROM *table_name*)
- (v) List of queries and their corresponding SQL queries (to be demonstrated) and outputs/results – show the list in **the order as contributed by each individual member**.

Note: please refer to **Appendix A** for more details of the report expectations

4. PRESENTATION-CUM-DEMONSTRATION (40% INDIVIDUAL)

The presentation-cum-demo (scheduled in weeks 17-18) should cover these aspects:

Each team member is to:

- (i) highlight any additional assumption you have made or amendment to the data model,
- (ii) demonstrate the queries and their corresponding SQL queries on the database submitted,
- (iii) produce solutions to ad hoc queries, and
- (iv) answer questions by the business owner and his IT Manager during the Q&A session (both roles to be played by your tutor).

5. PERFORMANCE CRITERIA

Refer to **Appendix B** for a list of performance criteria and the expectations to meet these criteria.

Important Note:

Students from the same team can be given **different grades** if tutors are convinced by evidence of widely unequal contribution by the members.

Submission

Your team's **SOFTCOPY report for Checkpoint 1** should be deposited by the team leader in his/her **BrightSpace Assignment Checkpoint 1 Submission link** by **15 Jan 2025, 23:59pm**. **NO LATE submission will be accepted** thus if it is not submitted before the due date and time, your team will get ZERO mark for this submission.

SOFTCOPY Final report should be deposited by the team leader in his/her **BrightSpace Assignment Final Submission link** by **02 Feb 2025, 23:59pm**. Your team's **HARDCOPY Final report** is to be submitted by **03 Feb 2025, 17:00pm** to the general office using the cover sheet attached.

10% of the marks will be deducted for everyday (inclusive of Saturdays, Sundays, and public holidays) after the deadline.

NO submission will be accepted **after 07 Feb 2025, 23:59 pm**.

Your tutor will inform you of the presentation-cum-demo schedule.

6. PLAGIARISM AND COPYRIGHT ISSUES

Ngee Ann Polytechnic (NP) develops students to uphold good academic practices, academic integrity and respect for the works of others. These practices are guided by the NP Plagiarism Policy which mandates that students assume full responsibility for the content and integrity of the academic work they submit.

The Policy and disciplinary procedures for offences is located at:
<https://www1.np.edu.sg/clte/antiplagiarism/policy.htm>

Plagiarism means, “copying any part of a source, and then submitting it, claiming that it is your own work.”

Please ensure that all the works submitted by you are not copied from other sources. Any attempt to plagiarize will be dealt with severely, and it may result in your failing the module.

If you have made any references to certain materials, make sure you cite the sources by acknowledging and providing the information necessary to find the source (e.g. Title and author of book, Internet links, etc.)

APPENDIX A: EXPLANATION OF REPORT DELIVERABLES

ER Model: This is the given ER model. You are to highlight any amendments made to the given ER model.

List of Mapped Relations: Your team needs to use the technique taught to logically map the final ER model entities into a set of relations. Each relation needs to have a name, primary key, foreign key(s), if applicable and attributes.

Data Dictionary: Your team should prepare the Data Dictionary based on the mapped relations created in the earlier step. You will need to identify the primary key, foreign key(s), if applicable, and the constraints for each attribute, such as Null or Not Null, default values, restrictions to data values, etc. It is strongly advised that you prepare the Data Dictionary before attempting to create the database and database tables.

Listing of SQL Commands for Tables Creation: Your team needs to include a listing of the DDL (Data Definition Language) commands to create the database, tables and DML commands to insert the sample tuples. It is advisable that your team creates a setup batch file to contain all the DDL and DML commands.

Content of all the Tables: Your team needs to include a listing of all the data within the database. While you must have **at least 10 tuples for each table (with very few exceptions such as category tables)**, you should ensure that there are **sufficient tuples to demonstrate the accuracy of your query**.

List of Queries, corresponding SQL queries and Result Sets: Each team member will demonstrate the 3 queries they have included in their report. Show the list in **the order as contributed by each individual member**.

N.B. The queries provided by each student should meet the requirements stated in the Checkpoint Requirements:

Each student should also provide 3 queries:

- these queries should be unique, i.e. students in a team should not have exactly the same query
- these queries should be non-trivial, i.e. they should involve at least two entities (tables) and meet one of the following criteria:
 - Utilises at least a scalar or aggregate function
 - Utilises the GROUP BY clause
 - Utilises a Sub Query
 - A combination of the above
- technically trivial queries are those that involve retrieving information from only one entity (table) without complicated functions, although such queries may not be trivial from the business point of view.

APPENDIX B: PERFORMANCE CRITERIA

To obtain a D Grade:

1. Conceptual ER model is mapped to logical data model.
2. Able to implement a logical data model into a physical database.
3. Implemented database is able to provide information to simple queries related to business requirements.
4. A fairly organised report.

To obtain a C Grade:

1. Conceptual ER model is **correctly mapped** to logical data model using the appropriate mapping rules.
2. Able to implement a logical data model into a physical database with **appropriate data definitions** (including format and size).
3. Implemented database is able to provide information to some **major** (and slightly complex) queries related to business requirements.
4. An organised report with clearly annotated diagrams/tables.

To obtain a A/B Grade:

1. Conceptual ER model is correctly mapped to logical data model using the appropriate mapping rules.
2. Able to implement a logical data model into a physical database with appropriate data definitions (including format and size), and **enforce primary key and foreign key constraints and appropriate constraints for attributes, where applicable.**
3. Implemented database is able to provide information to **all of the major queries** related to business requirements.
4. A well organised report with clearly annotated diagrams/tables, table of contents and page numbering.

S/N	Name	Type	Remarks
1	Member	Entity	Stores the details of a member of Mokesell
2	MemberID	Attribute	Unique ID
3	MemberName	Attribute	The name of a member
4	MemberDOB	Attribute	The date of birth of a member
5	MemberEmail	Attribute	The email address of a member
6	MemberMobile	Attribute	The mobile number of a member
7	MemberDateJoined	Attribute	The date when a member joins Mokesell
8	City	Attribute	The city of the member
9	DateStarted	Attribute	The date when a member started following another member
10	Seller	Entity	A subtype of a member
11	Buyer	Entity	A subtype of a member
12	Listing	Entity	Stores the details of an item listed by a seller
13	ListingID	Attribute	Unique ID
14	ListDesc	Attribute	Description of the listing
15	ListDateTime	Attribute	The date and time when the listing is made
16	ListPrice	Attribute	The price that is set by a seller for his/her item
17	ListStatus	Attribute	Status of listing: Available, Sold, Inactive (after 30 days)
18	ListDays	Attribute	The number of days a listing has been active
19	Photo	Attribute	Photos of item listed. Don't need to store the actual photos, but use Photo1, Photo2, Photo3, etc
20	DateLiked	Attribute	The date when a buyer likes a listing
21	Category	Entity	The category of a listing
22	CatID	Attribute	Unique ID
23	CatDesc	Attribute	The description of a listing category
24	SubCategory	Entity	The subcategory of a listing
25	SubCatID	Attribute	Unique ID
26	SubCatDesc	Attribute	The description of a subcategory of a listing category
27	Chat	Entity	Stores the details of a chat between a seller and a buyer
28	ChatID	Attribute	Unique ID
29	ChatMsg	Entity	Stores the details of each message that is part of a chat
30	MsgSN	Attribute	The message sequence number in a chat, eg. 1, 2, 3, ...
31	MsgDateTime	Attribute	The date and time when a message is sent
32	Originator	Attribute	The person who types the message. Values: Seller, Buyer
33	Msg	Attribute	The message that is part of a chat
34	Offer	Entity	Stores the details of an offer from a buyer
35	OfferID	Attribute	Unique ID
36	OfferPrice	Attribute	The price offered by a buyer
37	OfferStatus	Attribute	Values: Submitted, Pending, Accepted, Rejected, Completed
38	OfferDate	Attribute	The date when an offer is made
39	Review	Entity	Stores the details of a review from a seller or buyer after an offer is completed
40	ReviewID	Attribute	Unique ID
41	MemberType	Attribute	The person who submits the review. Values: Seller, Buyer
42	ReviewDate	Attribute	The date when the review is submitted
43	ItemRank	Attribute	1-5 stars
44	DeliverRank	Attribute	1-5 stars
45	CommunicationRank	Attribute	1-5 stars

46	Comment	Attribute	Additional comment
47	Bump	Entity	Stores the details of a bump
48	BumpID	Attribute	Unique ID
49	BumpDesc	Attribute	The description of a bump
50	BumpPrice	Attribute	The price of a bump
51	BumpOrder	Entity	Stores the details of a bump order by a seller in order to promote his/her listing
52	BumpOrderID	Attribute	Unique ID
53	PurchaseDate	Attribute	The date when a seller purchase a bump
54	Feedback	Entity	Stores the details of a feedback reported by a member
55	FbkID	Attribute	Unique ID
56	FbkDesc	Attribute	The description of a feedback
57	FbkDateTime	Attribute	The date and time when a feedback is received
58	FbkStatus	Attribute	The status of a feedback. For example: Pending, Receiving Attention, Completed
59	SatisfactionRank	Attribute	1-5 stars
60	FeedbkCat	Entity	Stores the details of a Feedback category
61	FbkCatDesc	Attribute	For example: Technical Problem, Problem with another User, Problem with Listing, Suggestion
62	Staff	Entity	Stores the details of a Mokesell staff
63	StaffID	Attribute	Unique ID
64	StaffName	Attribute	The name of a staff
65	StaffMobile	Attribute	The mobile number of a staff
66	StaffDateJoined	Attribute	The date when a staff joins Mokesell
67	Team	Entity	Stores the details of a staff team
68	TeamID	Attribute	Unique ID
69	TeamName	Attribute	The name of a team
70	Award	Entity	Stores the details of a award
71	AwardID	Attribute	Unique ID
72	AwardName	Attribute	The name of an award
73	AwardAmt	Attribute	The amount of an award
74	DateAwarded	Attribute	The date when the award is given

APPENDIX D: MOKESELL – CASE INFORMATION

MokeSell is an online platform that serves as a consumer-to-consumer marketplace for buying and selling new and second-hand items.

To use its platform, a user must create an account which can be used both for selling and buying items. Each user can have only one account. Users can “follow” another user’s profile. This allows them to be updated whenever the user that they are following has posted a new listing.

Sellers would need to create a listing for the item that he is selling. A seller must select an appropriate category for his listing for buyers to be able to find it easily. He will need to post photos for the item that he is selling and indicate the asking price and whether the item is new or second-hand and describe the condition of the item clearly. A seller can only have a maximum of 30 active listings at any one time for free. A listing is active for 30 days, after which it will automatically become inactive. Buyers will not see inactive listings. As time goes by, a listing will be less visible to buyers as its ranking goes down. To increase sales, a seller can select a listing and then promotes its ranking by purchasing a “bump” using a credit card. After a listing is bumped, it will behave like a normal listing and will move down as new listings are added to the marketplace. There are different types of bumps, each has its own price tag (e.g. Bump once – instantly, Bump daily for 3/7 days, Bump twice a day, for 3 days).

A buyer may search for an item specifically or browse the listings by category/sub-category. The buyer may save a listing for viewing later by “Liking” the listing or start a chat to connect with the seller to discuss about the arrangement to carry out the transaction, for example, to meet up and pay cash on delivery or do a bank transfer and have the item mailed. No payment transfer between users can be done via MokeSell’s platform in its first version of the system. Once the details of the transaction have been agreed and confirmed, the buyer can proceed to formally make an offer for the item by submitting an offer price through the system.

Upon the seller’s acceptance of the offer, both the buyer and seller can post a review for each other to share their transactional experience. Reviews are important to help build trust within the marketplace as they help users to gauge the credibility of other users. For a user to post a review, a complete transaction must be made. A user can only submit one review per transaction. In reviewing, besides giving qualitative comments, a user can rate the other party in a number of area on a scale of 1 to 5; for example, Communication, Coordination of meetup/delivery and Actual item to description.

MokeSell users can feedback on any issue or problem to MokeSell. In submitting the feedback, the user will have to categorise the feedback (e.g.; Technical Problem, Complaint Against Seller, etc). Each feedback will be assigned to a support staff. Once a feedback has been handled completely and closed, the user can rate the Mokesell staff’s response. To ensure a high level of user satisfaction, support staff are organised into teams which are then rewarded based on the ratings provided by the users. Each team will be led by a team manager.

To allow the platform to be ready in time for the launch, the following function will be handled by another development team:

- The interfaces with the banks for the payment.



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SCHOOL OF INFOCOMM TECHNOLOGY

Diploma in Information Technology
Diploma in Data Science

Databases Assignment (40% of DB Module)

Checkpoint 1 Submission (**15% of the Assignment**)

Deliverables	Deadline	Submission
Softcopy (Logical Design)	15 Jan 2025, 23:59 pm NO LATE SUBMISSION WILL BE ACCEPTED.	BrightSpace Assignment Checkpoint 1 Submission Link

DB Class Group			
Team Number			Team Grade:
Tutor			
Members	Student No.	Student Name	Individual Grade



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SCHOOL OF INFOCOMM TECHNOLOGY

Diploma in Information Technology

Diploma in Data Science

Databases Assignment – FINAL Report (40% of DB Module)

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