



Project Report

Module Name	WSQ Database Design and Implementation (SF)
Course Name	Postgraduate Diploma in Software Engineering
Assignment Title	Plan, Design, and Implement a Database for eCommerce Portal

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Date Issued	Completion Date	Submitted On
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Table of Contents

1. Project Background	4
2. Project Objective	4
3. Functional, Non-functional and Technical Requirements	4
4. Task1 Define	5
5. Task 2 Design Database	5
5.1 Data Normalization	5
5.2 Conceptual Design	10
5.3 Define Entities	10
6. Task 3 - Database Dictionary	11
7. Task 4 -MySQL Implement.....	12
7.1 Create talbes in MySQL.....	12
7.2 List of pages with query and screenshot of result	14
7.3 Create User	15
7.2 Grant Privileges	15
8. Task 5 – Index & Backup.....	17
8.1. Create Index.....	17
8.2 Backup Database & Schedule Backup.....	18
9. Task 6 – Apply MySQL	24
9.1 Create 8 SQL queries.....	24
9.2 Import Data through.csv file	28

LIST OF FIGURE

Figure 1 Sample Data Template.....	5
Figure 2 Normalization Process.....	6
Figure 3 1NF - Identify repeating attribute.....	6
Figure 4 1NF-Final	6
Figure 5 1NF - Dependence Diagram	7
Figure 6 2NF - Converting to 2NF.....	7
Figure 7 2NF - Dependency Diagram.....	8
Figure 8 3NF - Breakdown into separate table(1).....	8
Figure 9 3NF - Breakdown into separate table(2).....	8
Figure 10 3NF - Dependency Diagram.....	9
Figure 11 ERD by erdplus.com	10
Figure 12 Detail ERD by MySQL WorkBench	10
Figure 13 Table Buyer	12
Figure 14 Item Diagram	13
Figure 15 Table Payment Method	13
Figure 16 Table Seller.....	13
Figure 17 Table Shop_Cart_Info.....	14
Figure 18 Table Transaction	14
Figure 19 Create & Grant Privileges.....	16
Figure 20 Login Buyer Account	16
Figure 21 Login - Seller Account.....	16
Figure 22 Show Grant for User.....	17
Figure 23 Create Backup DB.....	18
Figure 24 Open Task Schedule	20
Figure 25 Create Task Name	20
Figure 26 Select Detail for task	21
Figure 27 Select Action to be triggered	21
Figure 28 Check after scheduled time	22
Figure 29 Create new Database	22
Figure 30 New Database	22
Figure 31 Prompt restore the database.....	23
Figure 32 Step1-Import .csv file	28
Figure 33 Step2 - Import .csv file	28
Figure 34 Step3 - insert csv into a new table.....	29
Figure 35 Import .csv processing	29
Figure 36 Declare the data format loaded from the .csv file.....	30
Figure 37 Complete the file loading process	30

LIST OF TABLE

Table 1 Organizing Attributes	11
Table 2 Data Dictionary.....	11
Table 3 List Page Queries	14
Table 4 Table of Index.....	17
Table 5: Report 1- Overall About Seller	24
Table 6 Report 2 - Bussiness Status	25

1. Project Background

You currently work as a Data Engineer for Brightica design agency, where you design and implement data models for client-centric products. As part of the role, your manager Mr. Andrew assigned the project to develop an optimal database design to deliver Rich Internet Application for Boutiqa. Boutiqa is a marketplace for sellers to promote their products and for consumers to purchase with ease. The company wants to have a consumer-centric application with an enhanced user experience

2. Project Objective

The goal of the project is to build a database system, helping Boutiqa manage information effectively. At Boutiqa admin can view and manage information related to:

- Manage Seller's Data
- Manage Buyer's Data
- Manage Items' information

These entities are related to each other, easy to query according to many different requirements, this access is done based on permissions for different users, supporting the operations department to perform tasks. Helping analysing and evaluating the business situation, managing and maintaining website operations well.

Project are required to demonstrate your capabilities in the following areas:

- Planning of database use group
- Conceptual, Logical, and Physical design of the database
- Writing queries and stored procedures to optimize the system performance and management reports.

The scope of the project in this module is to design and develop and implement the database. The overview of the project is as below:

There are 3 types of users:

1. Sellers
2. Consumers
3. Administrator

3. Functional, Non-functional and Technical Requirements

Sellers should be able to perform following functions in the portal:

1. Register in the portal.
2. Update their Profile after logging in.
3. Maintain the product catalog to promote their products.

Consumers should be able to perform following functions in the portal:

1. Register in the portal.
2. Update their Profile after logging in.
3. Search products.
4. Choose products to view the details.
5. Add, edit, and remove items in the shopping cart.

Administrator should be able to perform following functions in the portal:

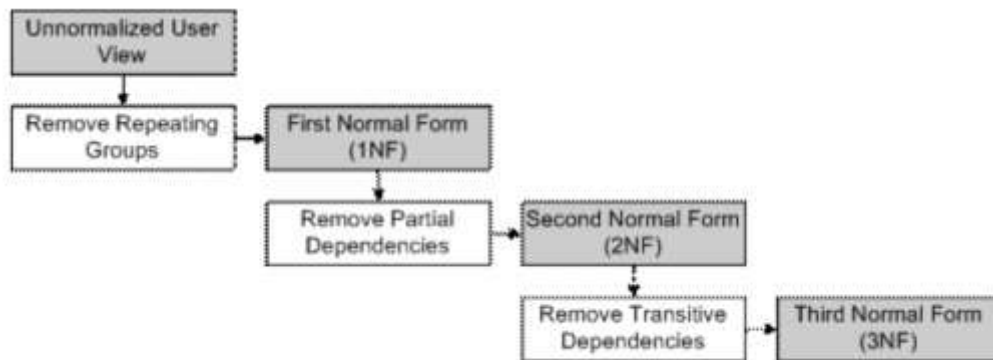


Figure 2 Normalization Process

5.1.2 First Normal Form

Identify repeating attribute.

Figure 3 1NF - Identify repeating attribute

Remove these repeating attributes to a new table together with a copy of the key from the UNF table.

Figure 4 1NF-Final

Assign a key to the new table (and underline it). The key from the original unnormalised table always becomes part of the key of the new table.

Dependence Diagram

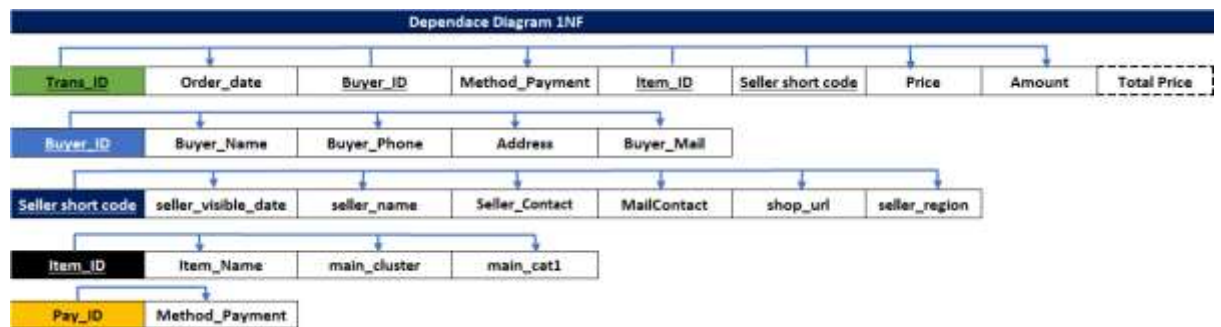


Figure 5 INF - Dependence Diagram

- Total Price is a derived attribute.
- Buyer_Name, Buyer_Phone, Address, Buyer_Mail depend on Buyer_ID
- Seller_visible_date, Seller_name, Seller_contact, MailContact, shop_url, seller_region depend on Seller_short_code
- Item, main_cluster, main_cat1 depend on Item_ID
- Method_payment depend on Pay_ID

5.1.3 Second Normal Form

Trans_ID	Order_date	Buyer_ID	Pay_ID	Item_ID	Seller short code	Price	Amount	Total Price
30001	2023-10-13 00:00:43	08175	1	20230001/VN12H06R	5	5.00	1	5
30002	2023-10-13 00:00:48	08175	1	20230002/VN12H06R	5	5.00	7	49
30003	2023-10-13 00:00:49	08175	1	20230003/VN12H06R	5	5.00	7	49
30004	2023-10-13 00:00:44	88469	2	20230008/VN12H06R	5	5.00	10	49
30005	2023-10-13 00:00:43	08175	1	20230003/VN12H06R	5	2.00	7	14
30006	2023-10-13 00:00:43	88469	2	20230003/VN12H06R	5	2.00	12	24
30007	2023-10-13 17:30:49	88469	2	20230005/VN12H06R	5	7.00	8	56
30008	2023-10-13 17:30:49	88469	2	20230008/VN12H06R	5	12.00	20	240
30009	2023-10-13 17:30:49	08175	1	20230005/VN12H06R	5	12.00	39	156
30010	2023-10-13 17:30:49	08175	1	20230006/VN12H06R	5	3.00	9	27
30011	2023-10-13 17:30:49	88469	2	20230006/VN12H06R	5	4.00	10	40
30012	2023-10-13 17:30:49	88469	2	20230003/VN12H06R	5	2.00	0	0
30013	2023-10-13 17:30:49	88469	1	20230008/VN12H06R	5	5.00	39	58
30014	2023-10-13 17:30:49	88469	1	20230007/VN12H06R	5	10.00	7	70
30015	2023-10-13 22:00:31	08175	1	20230002/VN12H06R	5	7.00	4	28
30016	2023-10-13 22:00:31	88469	1	20230002/VN12H06R	5	3.00	13	39
30017	2023-10-13 22:00:31	88469	2	20230008/VN12H06R	5	8.00	1	0
30018	2023-10-13 22:00:31	08175	1	20230008/VN12H06R	5	8.00	9	72
30019	2023-10-13 22:00:31	88469	1	20230006/VN12H06R	5	8.00	10	158
30020	2023-10-13 22:00:42	08175	1	20230006/VN12H06R	5	7.00	39	109

Trans_ID	Order_date	Buyer_ID	Pay_ID	Item_ID	Seller short code	Price	Amount	Total Price
30021	2023-10-13 22:00:42	08175	1	20230001/VN12H06R	5	5.00	1	5
30022	2023-10-13 22:00:42	08175	1	20230002/VN12H06R	5	5.00	7	49
30023	2023-10-13 22:00:42	08175	1	20230003/VN12H06R	5	5.00	7	49
30024	2023-10-13 22:00:42	88469	2	20230008/VN12H06R	5	5.00	10	49
30025	2023-10-13 22:00:42	08175	1	20230003/VN12H06R	5	2.00	7	14
30026	2023-10-13 22:00:42	88469	2	20230003/VN12H06R	5	2.00	12	24
30027	2023-10-13 22:00:42	88469	2	20230005/VN12H06R	5	7.00	8	56
30028	2023-10-13 22:00:42	88469	2	20230008/VN12H06R	5	12.00	20	240
30029	2023-10-13 22:00:42	08175	1	20230005/VN12H06R	5	12.00	39	156
30030	2023-10-13 22:00:42	08175	1	20230006/VN12H06R	5	3.00	9	27
30031	2023-10-13 22:00:42	88469	2	20230006/VN12H06R	5	4.00	10	40
30032	2023-10-13 22:00:42	88469	2	20230003/VN12H06R	5	2.00	0	0
30033	2023-10-13 22:00:42	88469	1	20230008/VN12H06R	5	5.00	39	58
30034	2023-10-13 22:00:42	88469	1	20230007/VN12H06R	5	10.00	7	70
30035	2023-10-13 22:00:42	08175	1	20230002/VN12H06R	5	7.00	4	28
30036	2023-10-13 22:00:42	88469	1	20230002/VN12H06R	5	3.00	13	39
30037	2023-10-13 22:00:42	88469	2	20230008/VN12H06R	5	8.00	1	0
30038	2023-10-13 22:00:42	08175	1	20230008/VN12H06R	5	8.00	9	72
30039	2023-10-13 22:00:42	88469	1	20230006/VN12H06R	5	8.00	10	158
30040	2023-10-13 22:00:42	08175	1	20230006/VN12H06R	5	7.00	39	109

Trans_ID	Order_date	Buyer_ID	Pay_ID	Item_ID	Seller short code	Price	Amount	Total Price
30041	2023-10-13 22:00:42	08175	1	20230001/VN12H06R	5	5.00	1	5
30042	2023-10-13 22:00:42	08175	1	20230002/VN12H06R	5	5.00	7	49
30043	2023-10-13 22:00:42	08175	1	20230003/VN12H06R	5	5.00	7	49
30044	2023-10-13 22:00:42	88469	2	20230008/VN12H06R	5	5.00	10	49
30045	2023-10-13 22:00:42	08175	1	20230003/VN12H06R	5	2.00	7	14
30046	2023-10-13 22:00:42	88469	2	20230003/VN12H06R	5	2.00	12	24
30047	2023-10-13 22:00:42	88469	2	20230005/VN12H06R	5	7.00	8	56
30048	2023-10-13 22:00:42	88469	2	20230008/VN12H06R	5	12.00	20	240
30049	2023-10-13 22:00:42	08175	1	20230005/VN12H06R	5	12.00	39	156
30050	2023-10-13 22:00:42	08175	1	20230006/VN12H06R	5	3.00	9	27
30051	2023-10-13 22:00:42	88469	2	20230006/VN12H06R	5	4.00	10	40
30052	2023-10-13 22:00:42	88469	2	20230003/VN12H06R	5	2.00	0	0
30053	2023-10-13 22:00:42	88469	1	20230008/VN12H06R	5	5.00	39	58
30054	2023-10-13 22:00:42	88469	1	20230007/VN12H06R	5	10.00	7	70
30055	2023-10-13 22:00:42	08175	1	20230002/VN12H06R	5	7.00	4	28
30056	2023-10-13 22:00:42	88469	1	20230002/VN12H06R	5	3.00	13	39
30057	2023-10-13 22:00:42	88469	2	20230008/VN12H06R	5	8.00	1	0
30058	2023-10-13 22:00:42	08175	1	20230008/VN12H06R	5	8.00	9	72
30059	2023-10-13 22:00:42	88469	1	20230006/VN12H06R	5	8.00	10	158
30060	2023-10-13 22:00:42	08175	1	20230006/VN12H06R	5	7.00	39	109

Figure 6 2NF - Converting to 2NF

Independence Diagram

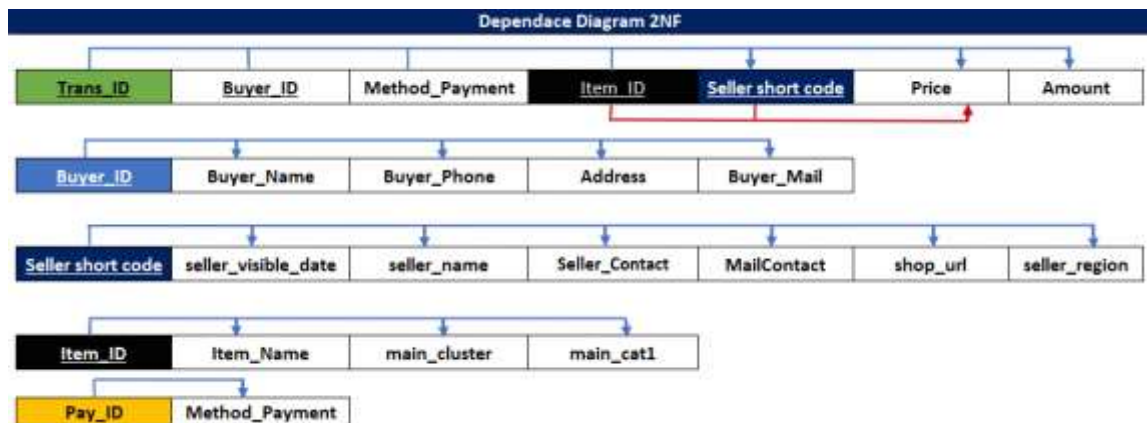


Figure 7 2NF - Dependency Diagram

In this case, there is one transitive dependence, that price will depend on Item_ID and Seller_short_code. That mean, one item will be sold by many seller with many difference price.

So we need to remove transitive dependence in 3NF.

5.1.4 Third Normal Form

Transaction					Method payment		Shop cart			
Tran_ID	Buyer_ID	Pay_ID	Seller short_ID	Amount	Pay_ID	Method_Payment	Trans short_ID	Trans_ID	Seller short code	Price
10001	08175	1	SC_014	1	1	Bank Card	SC_001	20210001	VN010001	1
10002	08175	1	SC_011	7	2	Credit Card	SC_002	20210002	VN010002	1
10003	08175	1	SC_012	7	3	Cash	SC_003	20210003	VN010003	1
10004	88469	2	SC_001	10			SC_004	20210004	VN010004	1
10005	08175	1	SC_006	7			SC_005	20210005	VN010005	1
10006	88469	2	SC_006	12			SC_006	20210006	VN010006	1
10007	88469	3	SC_005	8			SC_007	20210007	VN010007	1
10008	88457	1	SC_008	20			SC_008	20210008	VN010008	1
10009	08175	1	SC_008	10			SC_009	20210009	VN010009	1
10010	08175	2	SC_010	9			SC_010	20210010	VN010010	1
10011	88457	2	SC_009	16			SC_011	20210011	VN010011	1
10012	88457	3	SC_006	3			SC_012	20210012	VN010012	1
10013	88469	1	SC_002	10			SC_013	20210013	VN010013	1
10014	88469	1	SC_004	7			SC_014	20210014	VN010014	1
10015	08175	3	SC_013	4			SC_015	20210015	VN010015	1
10016	88469	1	SC_007	13			SC_016	20210016	VN010016	1
10017	88469	2	SC_003	1			SC_017	20210017	VN010017	1
10018	08175	3	SC_003	9			SC_018	20210018	VN010018	1
10019	88457	1	SC_003	16			SC_019	20210019	VN010019	1
10020	08175	3	SC_015	15			SC_020	20210020	VN010020	1

Item_ID	Item_Name	main_cluster	main_cat1
010001	Item Item 01	1, 11	Small Appliances
010002	Item Item 02	1, 11	Computers & Laptop
010003	Item Item 03	2, 14	Bag and Travel
010004	Item Item 04	2, 14	Bag and Travel
010005	Item Item 05	2, 14	Autom Accessories
010006	Item Item 06	2, 14	Beauty
010007	Item Item 07	2, 14	Beauty
010008	Item Item 08	4, 01	Household Supplies

Figure 8 3NF - Breakdown into separate table(1)

Buyer						
Buyer_ID	Buyer_Visible_date	Buyer_name	Buyer_Contact_Phone	Buyer_Contact_Mail	Buyer_shopURL	Buyer_region
08175	2023-07-27 10:27:50	Nguyen Thi Lan Anh	097996423	Nguyen.TL@gmail.com	https://www.lanhs.vn/shop/la	Hanoi
88457	2023-07-24 16:55:42	Le Hiep Dat	093888456	Nguyen.HD@gmail.com	https://www.hiepdat.vn/shop/hd	Hanoi
08175	2023-07-12 12:18:29	Hoang Duc Thanh	097777121	Nguyen.HD@gmail.com	https://www.hiepdat.vn/shop/hd	Hanoi
88469	2023-07-31 16:14:01	Vu Hong Ngoc Tran	093566384	Nguyen.VNT@gmail.com	https://www.vuhoangtranh.vn/shop/vt	HCM

Seller						
Seller short code	Seller_Visible_date	Seller_name	Seller_Contact_Phone	Seller_Contact_Mail	Shop_url	Seller_region
VN010001	2023-07-27 10:27:50	Nguyen	+8497988111	nguyen.N@gmail.com	https://www.lanhs.vn/shop/la	Hanoi
VN010002	2023-07-24 16:55:42	Nguyen (Many)	+8497988222	nguyen.N@gmail.com	https://www.lanhs.vn/shop/la	Hanoi
VN010003	2023-07-22 12:08:29	Long Phung	+84979444555	nguyen.N@gmail.com	https://www.lanhs.vn/shop/la	Hanoi
VN010004	2023-07-31 16:14:01	MD BOU THOU	+84979000222	nguyen.N@gmail.com	https://www.lanhs.vn/shop/la	Other
VN010005	2023-07-31 16:14:01	Phung Huu	+84979123321	nguyen.N@gmail.com	https://www.lanhs.vn/shop/la	HCM

Figure 9 3NF - Breakdown into separate table(2)

Dependency Diagram

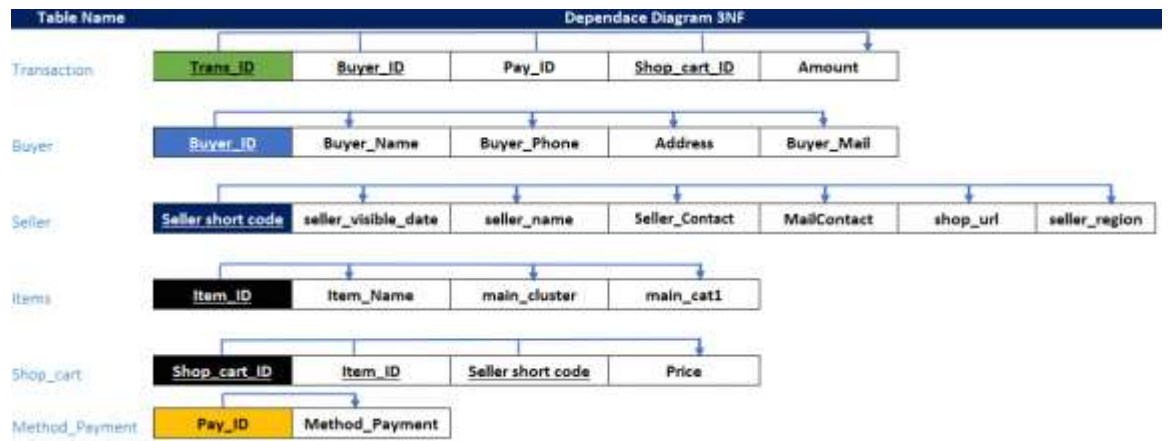


Figure 10 3NF - Dependency Diagram

5.2 Conceptual Design

ER Diagram

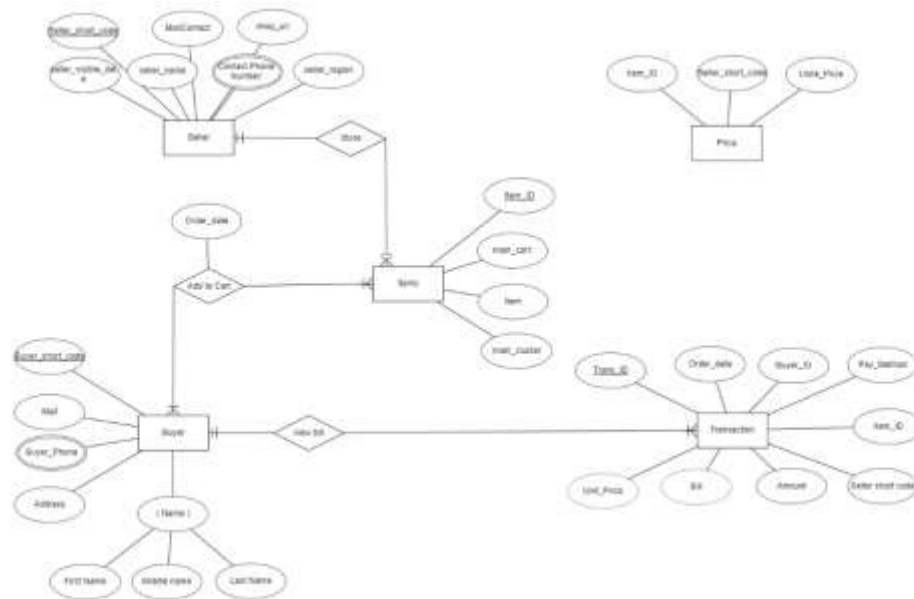


Figure 11 ERD by erdplus.com

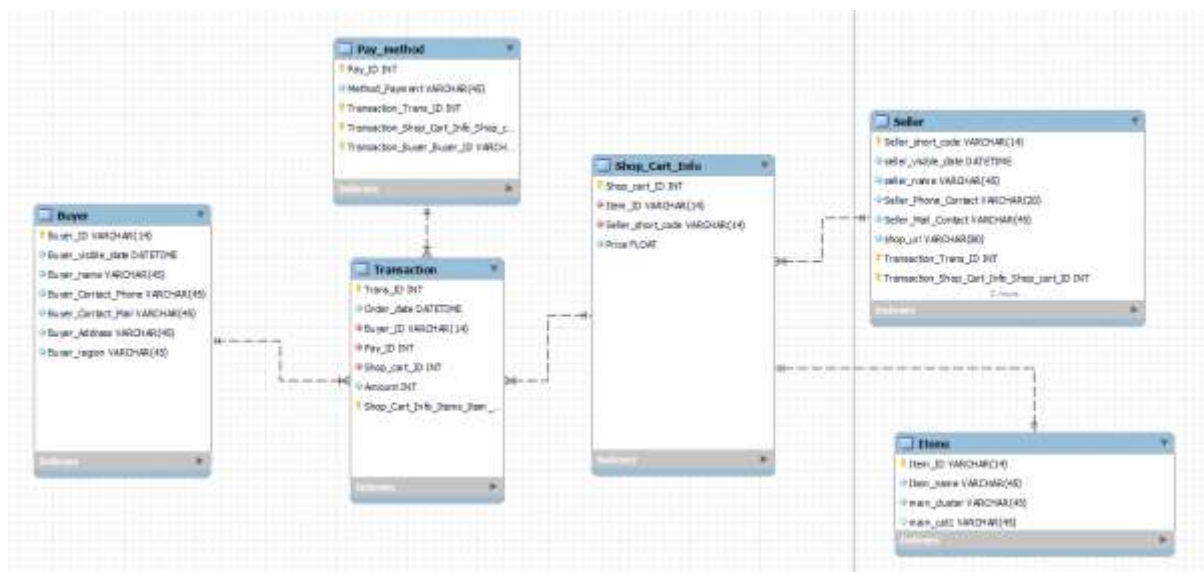


Figure 12 Detail ERD by MySQL WorkBench

5.3 Define Entities

5.3.1 Requirement gathering

Base on the requirement we collect the following information

- One Seller can sell many items.
- Items will be identified and categories by system
- One items can be sell by many seller with many difference competitive prices.
- Price for each item will be decided by seller.

- Buyer can buy many items from difference shop.

5.3.2 Organizing Entities & Attributes

Table 1 Organizing Attributes

Seller	Buyer	Item ID	Shop_cart_info	Transaction
Seller short code	Buyer_short_code	Item_ID	Shop_cart_ID	Trans_ID
seller_visible_date	Name	Item	Item_ID	Order_date
seller_name	Buyer_Phone	main_cluster	Seller_short_code	Buyer_ID
Contact Phone Number	Address	main_cat1	Price	Method Payment
MailContact	Mail			Purchase_ID
shop_url				Amount
seller_region				

6. Task 3 - Database Dictionary

Table 2 Data Dictionary

Data	Attributes	Choosing Appropriate Data Type	Data Types
Seller	Seller_short_code	Unit ID, contain Text & number with lenth around 8, so we can choose VARCHAR(14)	VARCHAR(14)
	seller_visible_date	The first time seller start to appper, need to detail date & time so we can choose DATETIME	DATETIME
	seller_name	This will contain characters of variable length, So we can use VARCHAR(45)	VARCHAR(45)
	Seller_Phone_Contact	Phone will also contain characters of width up to 20 Characters. We can use VARCHAR(20), to Accomodateup to 2 numbers	VARCHAR(20)
	Seller_Mail_Contact	Email is also variable number of characters with size up to 80 Character	VARCHAR(80)
	shop_url	May be a link with long tail so we can choose TEXT	TEXT
	seller_region	This will contain characters of variable length, So we can use	VARCHAR(45)
Buyer	Buyer_ID	Unit ID, contain Text & number with lenth around 8, so we can choose VARCHAR(14)	VARCHAR(14)
	Buyer_visible_date	The first time seller start to appper, need to detail date & time so we can choose DATETIME	DATETIME
	Buyer_name	This will contain characters of variable length, So we can use VARCHAR(45)	VARCHAR(45)
	Buyer_Contact_Phone	Phone will also contain characters of width up to 20 Characters. We can use VARCHAR(20), to Accomodateup to 2 numbers	VARCHAR(20)
	Buyer_region	This will contain characters of variable length, So we can use VARCHAR(45)	VARCHAR(45)
	Buyer_Address	May be a link with long tail so we can choose TEXT	TEXT
	Buyer_Contact_Mail	Email is also variable number of characters with size up to 80 Character	VARCHAR(80)
Items	Item_ID	Unit ID, contain Text & number with lenth around 8, so we can choose VARCHAR(14)	VARCHAR(14)
	Item_name	This will contain characters of variable length, So we can use VARCHAR(45)	VARCHAR(45)

	main_cluster	This will contain characters of variable length, So we can use VARCHAR(45)	VARCHAR(45)
	main_cat1	This will contain characters of variable length, So we can use VARCHAR(45)	VARCHAR(45)
Shop_Cart_Info	Shop_cart_ID	Unit ID, contain Text & number with length around 8, so we can choose VARCHAR(14)	INT()
	Item_ID	Unit ID, contain Text & number with length around 8, so we can choose VARCHAR(14)	VARCHAR(14)
	Seller_short_code	Unit ID, contain Text & number with length around 8, so we can choose VARCHAR(14)	VARCHAR(14)
	Price	Value of unit price, we can choose FLOAT	FLOAT()
Pay_method	Pay_ID	Unit ID, contain Text & number with length around 8, so we can choose VARCHAR(2)	VARCHAR(2)
	Method_Payment	Should be one of some method payment, so we can choose VARCHAR(45)	VARCHAR(45)
Transaction	Trans_ID	Unit ID, contain NUMBER so we can choose INT()	INT()
	Order_date	The first time seller start to apper, need to detail date & time so we can choose DATETIME	DATETIME
	Buyer_ID	Unit ID, contain Text & number with length around 8, so we can choose VARCHAR(14)	VARCHAR(14)
	Pay_ID	Unit ID, contain Text & number with length around 8, so we can choose VARCHAR(2)	VARCHAR(2)
	Shop_cart_ID	Unit ID, contain Text & number with length around 8, so we can choose VARCHAR(14)	Int()
	Amount	Amount of each item will be sold, I want to limit in smallin	SMALLINT()

7. Task 4 -MySQL Implement

7.1 Create talbes in MySQL

Table Name: Schema: **project03**

Charset/Collation: Engine:

Comments:

Column Name	Datatype	PK	N..	U..	B	U..	ZF	AI	G	Default/Expressi...
Buyer_ID	VARCHAR(14)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Buyer_visible_date	VARCHAR(45)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Buyer_name	VARCHAR(45)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Buyer_contact_ph...	VARCHAR(45)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Buyer_contact_mail	VARCHAR(45)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Buyer_address	VARCHAR(45)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Buyer_region	VARCHAR(45)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

Figure 13 Table Buyer

Table Name: Schema: **project03**

Charset/Collation: Engine:

Comments:

Column Name	Datatype	PK	N..	U..	B	U..	ZF	AI	G	Default/Expressl...
Item_ID	VARCHAR(14)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Item_name	VARCHAR(45)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
main_cluster	VARCHAR(45)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
main_cat1	VARCHAR(45)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	NULL

Figure 14 Item Diagram

Table Name: Schema: **project03**

Charset/Collation: Engine:

Comments:

Column Name	Datatype	PK	N..	U..	B	U..	ZF	AI	G	Default/Expressl...
Pay_ID	INT	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Method_Payment	VARCHAR(45)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

Figure 15 Table Payment Method

Table Name: Schema: **project03**

Charset/Collation: Engine:

Comments:

Column Name	Datatype	PK	N..	U..	B	U..	ZF	AI	G	Default/Expressl...
Seller_short_code	VARCHAR(14)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
seller_name	VARCHAR(45)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Seller_Phone_Con...	VARCHAR(20)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Seller_Mail_Contact	VARCHAR(45)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
shop_url	VARCHAR(80)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Seller_region	VARCHAR(45)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

Figure 16 Table Seller

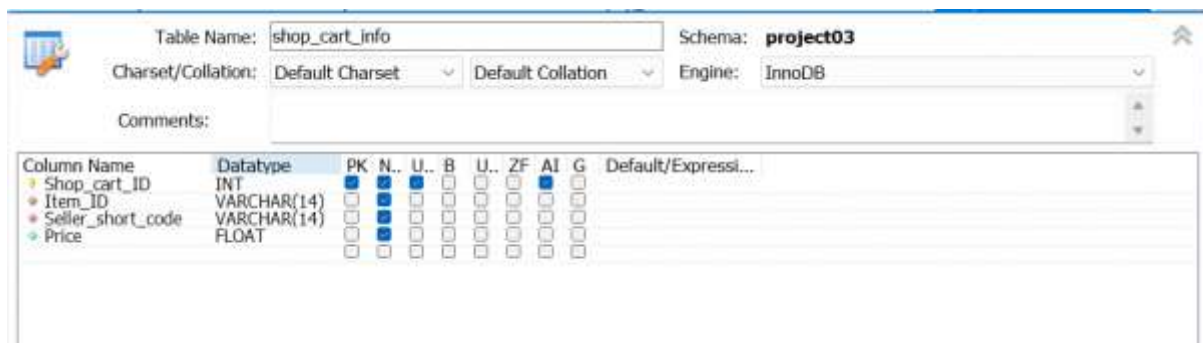


Figure 17 Table Shop_Cart_Info

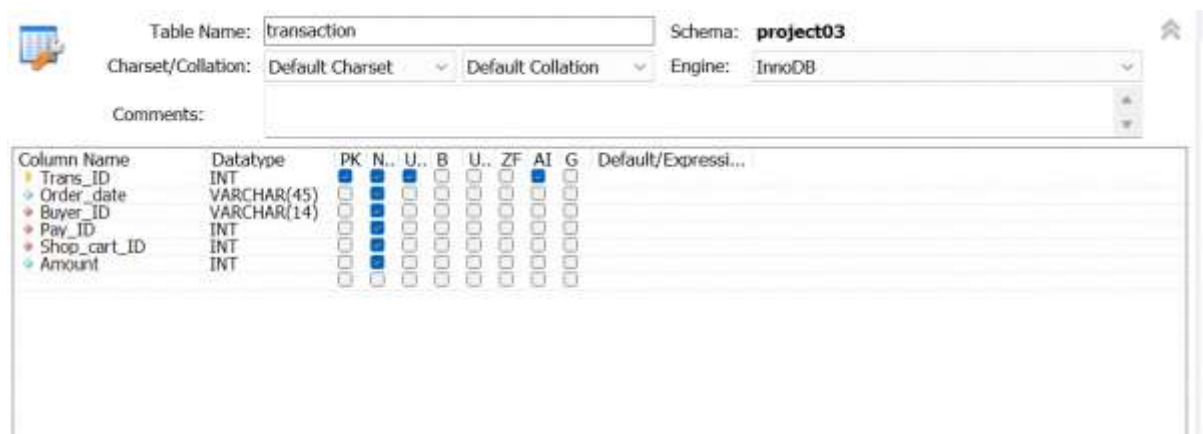


Figure 18 Table Transaction

7.2 List of pages with query and screenshot of result

Table 3 List Page Queries

PAGE	Purpose of Query	Query
Registration	For account creation of new Buyer	INSERT INTO project03.buyer VALUES ('88469','2023-07-27 10:27:10','Nguyen Thi Lan Anh','097999123','Buyer-001@gmail.com','123 Đường 01 P01 Thanh Xuaan','Hanoi');
	For account creation of new Seller	INSERT INTO project03.seller VALUES ('VNJ2NPUB','BKsmart','+84979888111','seller01-LZD@gmail.com','https://www.lazada.vn/shop/bksmart','Hanoi');
Update Profile	From UID Update Profile	UPDATE project03.seller SET seller_name = 'Seller audit 04' WHERE Seller_short_code = 'VNJ2LKE3';
CRUD Items	Maintain Product	INSERT INTO project03.items VALUES ('20230001','Item test 01','1. EL','Small Appliances'); UPDATE project03.items SET Item_name = 'Item_test_new'

		WHERE Item_ID = '20030001'
Create payment method	Insert one new Pay method	INSERT INTO project03.pay_method VALUES('1','E-Wallet');
Search Product	Search for Product	SELECT * from project03.Items WHERE Item_ID = '20030001';
Create Catalouge	Create 1 catalouge	INSERT INTO project03.shop_cart_info VALUES ('1','20230008','VNJ2JU4H','3');
Create transaction	Create one transaction	INSERT INTO project03.transaction VALUES ('10001','2023-10-23 00:01:43','08175','3','14','1');

7.3 Create User

In this project, we have three main type user: Buyer, Seller, Admin.

Admin will login with 'root' account, have the highest privileges.

So we have to create account for users and devide privileges.

```
CREATE USER 'Buyer_Account'@'localhost' IDENTIFIED BY 'minhtruong';
CREATE USER 'Seller_Account'@'localhost' IDENTIFIED BY 'minhtruong';
```

7.2 Grant Privileges

```
-- ALTER ROLE FOR SELLER
```

```
GRANT CREATE, DELETE, INSERT, SELECT, UPDATE on project03.seller to  
'Seller_Account'@'localhost';
```

```
GRANT CREATE, DELETE, INSERT, SELECT, UPDATE on project03.shop_cart_info  
to 'Seller_Account'@'localhost';
```

```
GRANT SELECT on project03.items to 'Seller_Account'@'localhost';
```

```
-- ALTER ROLE FOR BUYER
```

```
GRANT CREATE, DELETE, INSERT, SELECT, UPDATE on project03.buyer to  
'Buyer_Account'@'localhost';
```

```
GRANT SELECT on project03.shop_cart_info to 'Buyer_Account'@'localhost';
```

```
GRANT SELECT on project03.seller to 'Buyer_Account'@'localhost';
```

```
GRANT SELECT on project03.items to 'Buyer_Account'@'localhost';
```

```
GRANT SELECT on project03.pay_method to 'Buyer_Account'@'localhost';
```

```
GRANT CREATE, DELETE, INSERT, SELECT, UPDATE on project03.transaction to  
'Buyer_Account'@'localhost';
```

#	Time	Action	Message	Duration / Fetch
5	20:47:18	SELECT CURRENT_USER() LIMIT 0, 1000	1 row(s) returned	0.000 sec. / 0.000 sec
6	20:47:18	GRANT CREATE, DELETE, INSERT, SELECT, UPDATE on project03.seller...	0 row(s) affected	0.016 sec
7	20:47:18	GRANT CREATE, DELETE, INSERT, SELECT, UPDATE on project03.shop...	0 row(s) affected	0.000 sec
8	20:47:18	GRANT SELECT on project03.items to 'Seller_Account'@'localhost'	0 row(s) affected	0.000 sec
9	20:47:18	GRANT CREATE, DELETE, INSERT, SELECT, UPDATE on project03.buyer...	0 row(s) affected	0.000 sec
10	20:47:18	GRANT SELECT on project03.shop_cart_info to 'Buyer_Account'@'localhost'	0 row(s) affected	0.000 sec
11	20:47:18	GRANT SELECT on project03.seller to 'Buyer_Account'@'localhost'	0 row(s) affected	0.000 sec
12	20:47:18	GRANT SELECT on project03.items to 'Buyer_Account'@'localhost'	0 row(s) affected	0.010 sec
13	20:47:18	GRANT SELECT on project03.pay_method to 'Buyer_Account'@'localhost'	0 row(s) affected	0.000 sec
14	20:47:18	GRANT CREATE, DELETE, INSERT, SELECT, UPDATE on project03.trans...	0 row(s) affected	0.000 sec

Figure 19 Create & Grant Privileges

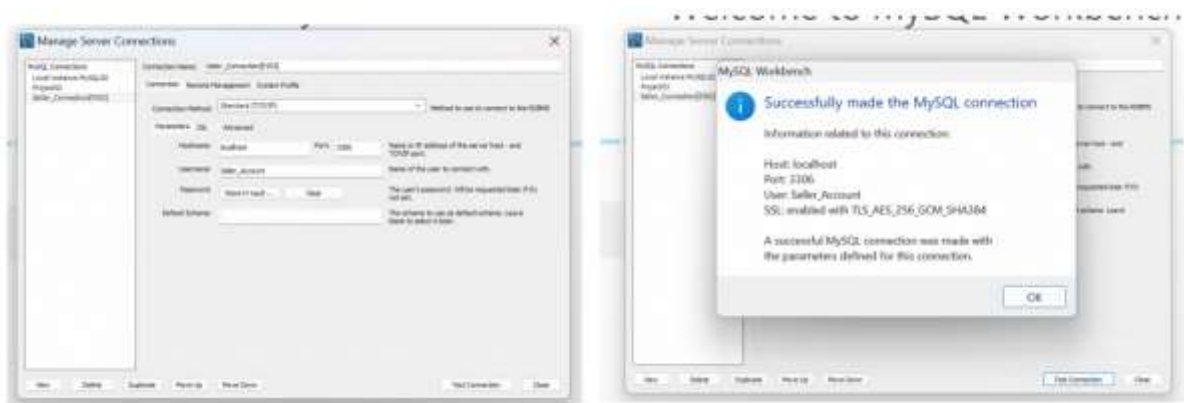


Figure 21 Login - Seller Account



Figure 20 Login Buyer Account

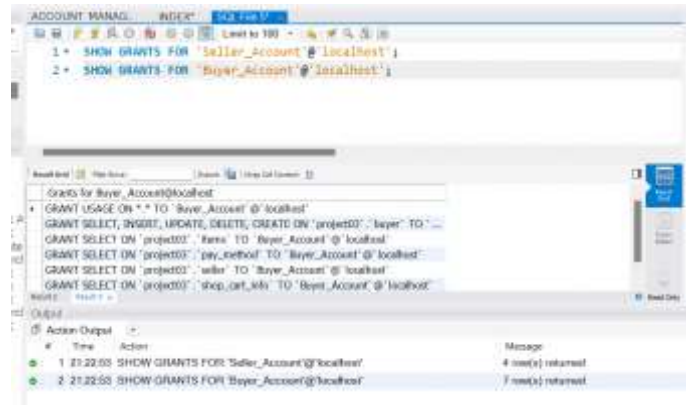


Figure 22 Show Grant for User

8. Task 5 – Index & Backup

8.1. Create Index

Table 4 Table of Index

Table	Index name	Query
project03.seller	Seller_idx Seller_region_idx	CREATE INDEX Seller_idx ON project03.seller(Seller_short_code ASC) VISIBLE; CREATE INDEX Seller_region_idx ON project03.seller(Seller_region ASC) VISIBLE;
project03.items	Items_idx Items_cluster_idx	CREATE INDEX Items_idx ON project03.items(Item_ID ASC) VISIBLE; CREATE INDEX Items_cluster_idx ON project03.items(main_cluster ASC) VISIBLE;
project03.pay_method	Pay_idx	CREATE INDEX Pay_idx ON project03.pay_method(Pay_ID ASC) VISIBLE;
project03.buyer	Buyer_idx	CREATE INDEX Buyer_idx ON project03.buyer(Buyer_ID ASC) VISIBLE;


```
mysqldump --user="User_Backup"@"localhost" --password="minhtruong" --databases  
project03 >"D:\Study\Master\Course 3 - Database Design and Implementation  
(SF)\Assignment\BackupData\backup.sql"
```

Run As Admin -> This command will auto create a identified file on folder

---- Reference : Doc + <https://www.youtube.com/watch?v=lo30JnIRVEU>

8.2.2 SCHEDULE BACKUP

Go to Task Schedule

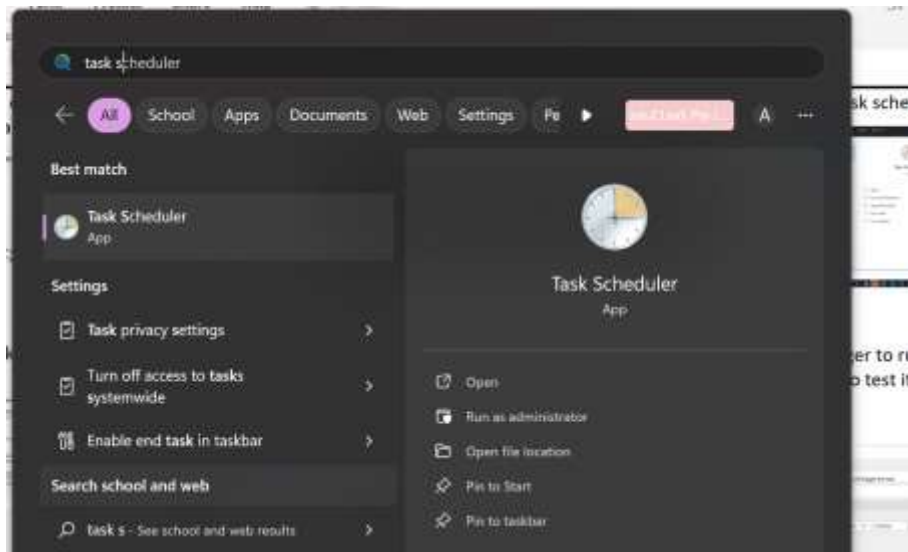


Figure 24 Open Task Schedule

Click Create Task & Enter Task Name

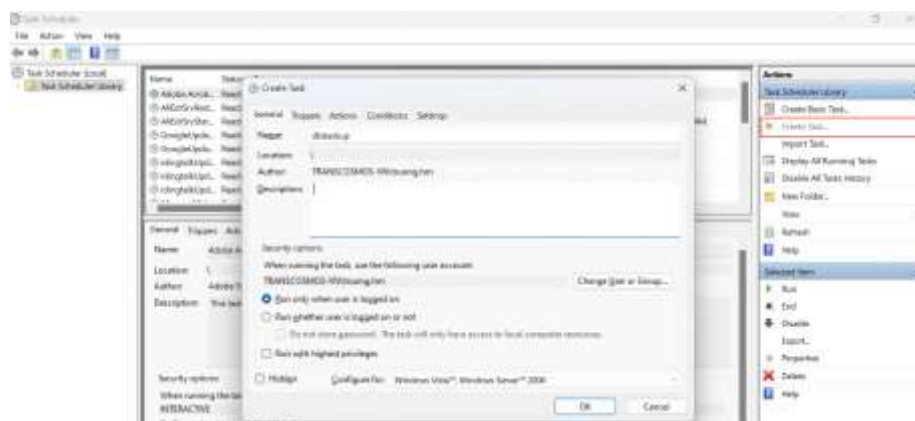


Figure 25 Create Task Name

Create the trigger to run the task at the scheduled time. To test it set as one time and verify it

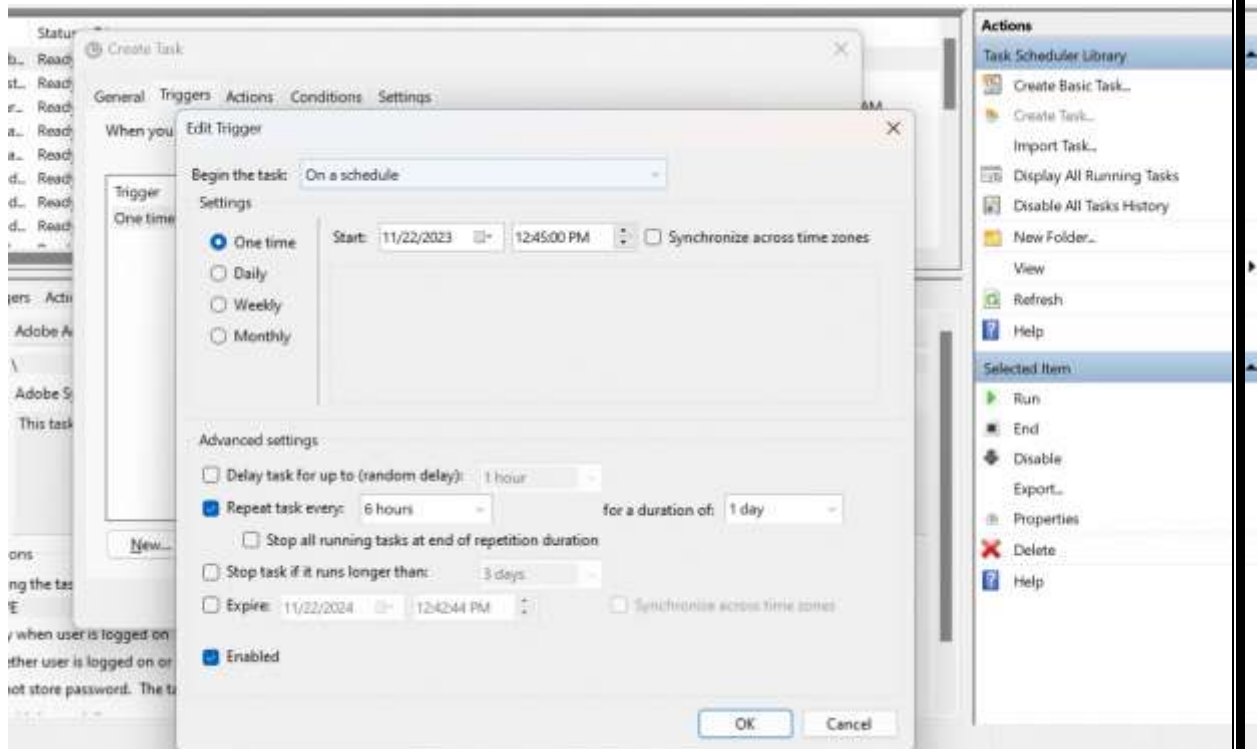


Figure 26 Select Detail for task

Set the action to be triggered. Browse and choose the batch file location

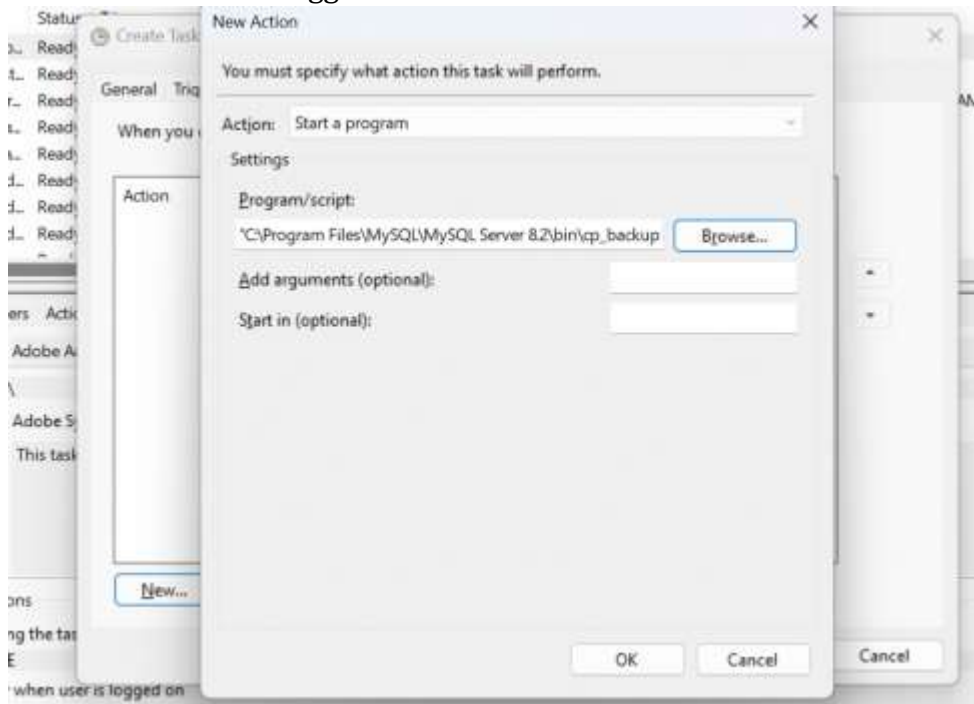


Figure 27 Select Action to be triggered

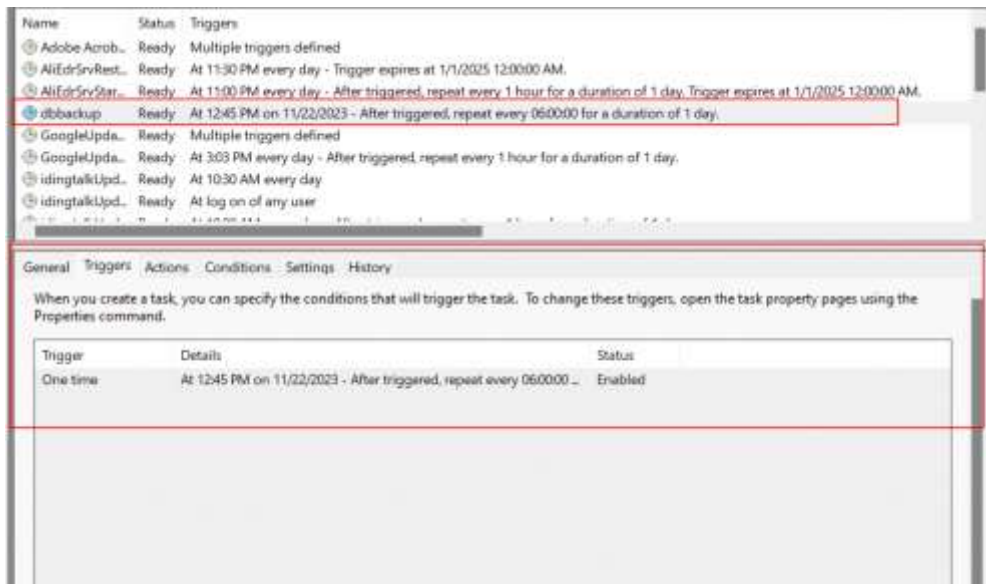


Figure 28 Check after scheduled time

Check the folder after the scheduled time. You will see your backup file

8.2.3 PROVIDE RESTORATION SCRIPT IN CASE OF FAILURE

Create new data base to contain data backup

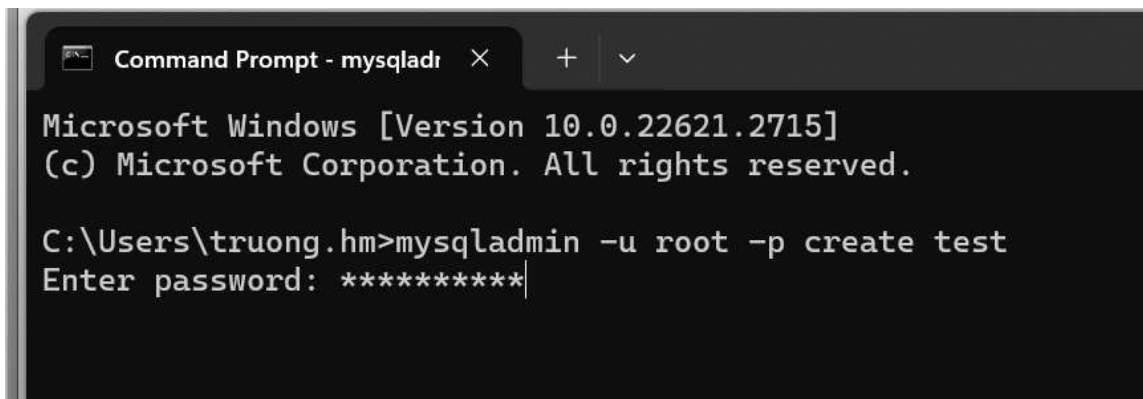


Figure 29 Create new Database

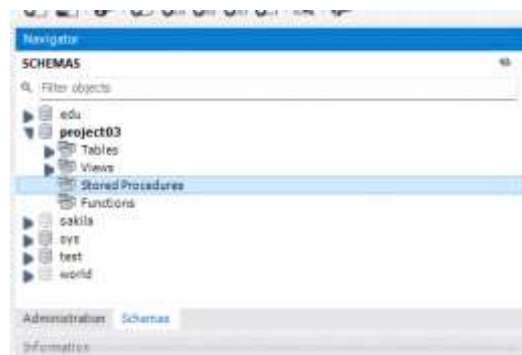
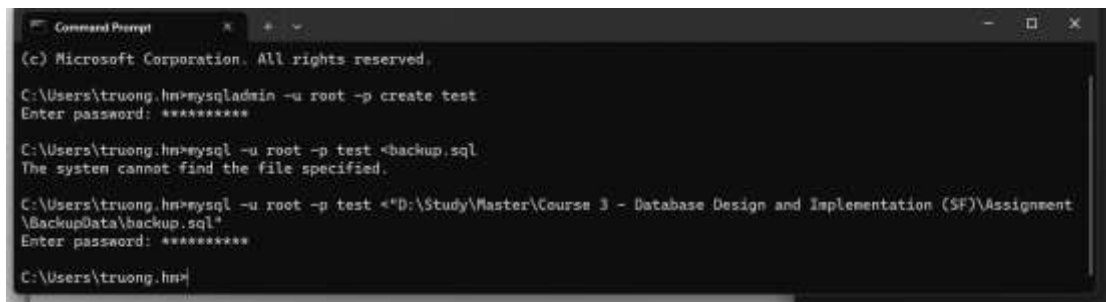


Figure 30 New Database

Use mysql to restore the database.



```
Command Prompt
(c) Microsoft Corporation. All rights reserved.

C:\Users\truong.hm>mysqladmin -u root -p create test
Enter password: *****

C:\Users\truong.hm>mysql -u root -p test <backup.sql
The system cannot find the file specified.

C:\Users\truong.hm>mysql -u root -p test <"D:\Study\Master\Course 3 - Database Design and Implementation (SF)\Assignment
\BackupData\backup.sql"
Enter password: *****

C:\Users\truong.hm>
```

Figure 31 Prompt restore the database

9. Task 6 – Apply MySQL

9.1 Create 8 SQL queries

In the report, I need to execute queries to answer the following questions:

1. Top 3 Main_Cluster that bring the biggest GMV
2. How Many Seller, Items Exist On System
3. Top 3 Seller Have Most Item Bought.
4. Total No Transaction & Total Gmv?
5. Top 3 Most Sold Products
6. Top 3 Main_Cluster That Bring The Biggest Gmv
7. Top 3 Main_Cluster That Bring The Biggest Gmv
8. How many customers are there in the system?
9. How many customers have purchased?
10. Which areas do most customers come from?
11. Percentage of customers returning to purchase
12. Buyer buys cost most?

I have organized the above questions into the following 3 reports:

9.1.1 RP 01 : OVERALL ABOUT SELLER

Table 5: Report 1- Overall About Seller

Title of the report	REPORT 01 OVERALL
Description	-- HOW MANY SELLER, ITEMS EXIST ON SYSTEM -- TOP 3 SELLER HAVE MOST ITEM BOUYED.
Purpose	Overview about seller & Item have on system
Query	-- HOW MANY SELLER, ITEMS EXIST ON SYSTEM SELECT concat("There are ",COUNT(distinct SELL.seller_name), " Seller and ", count(distinct GOOD.Item_name)," items that exis on system") FROM project03.seller as SELL , project03.items AS GOOD; -- TOP 3 SELLER HAVE MOST ITEM BOUYED. SELECT SELL.seller_name, COUNT(DISTINCT CART.Item_ID) AS No_Item FROM shop_cart_info AS CART INNER JOIN seller AS SELL ON CART.Seller_short_code = SELL.Seller_short_code GROUP BY SELL.seller_name ORDER BY No_Item DESC, SELL.seller_name ASC limit 3;

Result screenshot

concat("There are ",COUNT(distinct SELL.seller_name), " Seller and ", count(distinct GOOD.Item_name)," items that exis on system")

There are 5 Seller and 8 items that exis on system

seller_name	No_Item
LNG FISHING	4
BKsmart	3
Riinn Store (Manyo)	3

9.1.2 RP 02: BUSSINESS STATUS

Table 6 Report 2 - Bussiness Status

Title of the report	BUSSINESS STATUS												
Description	-- TOTAL No Transaction & total GMV? -- TOP 3 MOST SOLD PRODUCTS -- TOP 3 MAIN_CLUSTER THAT BRING THE BIGGEST GMV												
Purpose	To Deepdive more about business at this time												
Query	<p>-- TOTAL No Transaction & total GMV?</p> <p>Select COUNT(*) AS No_of_order, sum(REVENUE) AS Total_Revenue from overall_view;</p> <p>-- TOP 3 MOST SOLD PRODUCTS</p> <p>SELECT Item_name, sum(Amount) AS total_product_sold from overall_view</p> <p>GROUP BY Item_name</p> <p>ORDER BY total_product_sold DESC</p> <p>LIMIT 3;</p> <p>-- TOP 3 MAIN_CLUSTER THAT BRING THE BIGGEST GMV</p> <p>SELECT main_cluster, sum(REVENUE) AS Total_GMV from overall_view</p> <p>GROUP BY main_cluster</p> <p>ORDER BY Total_GMV DESC</p> <p>LIMIT 3;</p>												
Result screenshot	<pre> -- TOP 3 MOST SOLD PRODUCTS 56 * SELECT Item_name, sum(Amount) AS total_product_sold from overall_view 57 GROUP BY Item_name 58 ORDER BY total_product_sold DESC 59 LIMIT 3; -- TOP 3 MAIN_CLUSTER THAT BRING THE BIGGEST GMV 60 SELECT main_cluster, sum(REVENUE) AS Total_GMV from overall_view 61 GROUP BY main_cluster 62 ORDER BY Total_GMV DESC 63 LIMIT 3; </pre> <p>Result Grid</p> <table border="1"> <thead> <tr> <th>Item_name</th> <th>total_product_sold</th> </tr> </thead> <tbody> <tr> <td>Items Item 02</td> <td>31</td> </tr> <tr> <td>Items Item 03</td> <td>24</td> </tr> <tr> <td>Items Item 04</td> <td>24</td> </tr> </tbody> </table> <pre> -- RP #2: BUSSINESS STATUS -- TOTAL No Transaction & total GMV? 34 * Select COUNT(*) AS No_of_order, sum(REVENUE) 35 -- TOP 3 MOST SOLD PRODUCTS </pre> <p>Result Grid</p> <table border="1"> <thead> <tr> <th>No_of_order</th> <th>Total_Revenue</th> </tr> </thead> <tbody> <tr> <td>20</td> <td>1160</td> </tr> </tbody> </table>	Item_name	total_product_sold	Items Item 02	31	Items Item 03	24	Items Item 04	24	No_of_order	Total_Revenue	20	1160
Item_name	total_product_sold												
Items Item 02	31												
Items Item 03	24												
Items Item 04	24												
No_of_order	Total_Revenue												
20	1160												

Table 7 Report 03 - Buyer Behavior

Title of the report	03: BUYER BEHAVIOR
Description	-- How many customers are there in the system? -- How many customers have purchased? -- Which areas do most customers come from? -- Percentage of customers returning to purchase -- Buyer buys cost most?
Purpose	To understand more about customer's behavior
Query	-- How many customers are there in the system? -- How many customers have purchased? select (Select count(*) from buyer) as No_of_Buyer, (Select count(Distinct Buyer_ID) from transaction) as No_Buyer_Have_Order, Concat(ROUND(((Select count(Distinct Buyer_ID) from transaction)/(Select count(*) from buyer)),2)*100,"%") as Convert_Rate from buyer, transaction limit 1; -- Which areas do most customers come from? Select BUY.Buyer_region, count(*) as No_of_order from transaction AS TRANS inner join buyer AS BUY on TRANS.Buyer_ID = BUY.Buyer_ID GROUP BY BUY.Buyer_region ORDER BY No_of_order DESC LIMIT 1; -- Percentage of customers returning to purchase CREATE VIEW TEMP1 AS Select transaction.Buyer_ID, count(*) AS No_of_Order from transaction GROUP BY transaction.Buyer_ID -- ----- SELECT (SELECT COUNT(*) FROM TEMP1) AS No_Buyer, (SELECT COUNT(*) FROM TEMP1 WHERE No_of_Order > 1) AS No_Buyer_Re_Buy, Concat(ROUND(((SELECT COUNT(*) FROM TEMP1 WHERE No_of_Order > 1)/(SELECT COUNT(*) FROM TEMP1))*100,0,"%") AS RETURN_RATE FROM TEMP1 LIMIT 1; -- Buyer buys cost most? SELECT Buyer_name, sum(REVENUE) AS Total_Revenue FROM overall_view GROUP BY Buyer_name ORDER BY Total_Revenue LIMIT 1;

Result screenshot

No_of_Buyer	No_Buyer_Have_Order	Convert_Rate
4	3	75.00%


```

65 = SELECT (SELECT COUNT(*) FROM TEMP1) AS No_Buyer,
66 (SELECT COUNT(*) FROM TEMP1 WHERE No_of_Order > 0) AS No_Buyer_Have_Order,
67 ROUND((SELECT COUNT(*) FROM TEMP1 WHERE No_of_Order > 0)/(SELECT COUNT(*) FROM TEMP1))
68 FROM TEMP1
69 ORDER BY
70 ORDER BY

```

No_Buyer	No_Buyer_Have_Order	Convert_Rate
4	3	75.00%

Buyer region	No. of order
Hanoi	11


```

75 -- Buyer region count order
76 = SELECT Buyer_name, (COUNT(*) AS Total_Revenue
77 FROM master_line
78 GROUP BY Buyer_name
79 ORDER BY Total_Revenue
80 ORDER BY

```

Buyer name	Total Revenue
Hanoi	11

9.2 Import Data through.csv file

Import data through .csv in My SQL Workbench

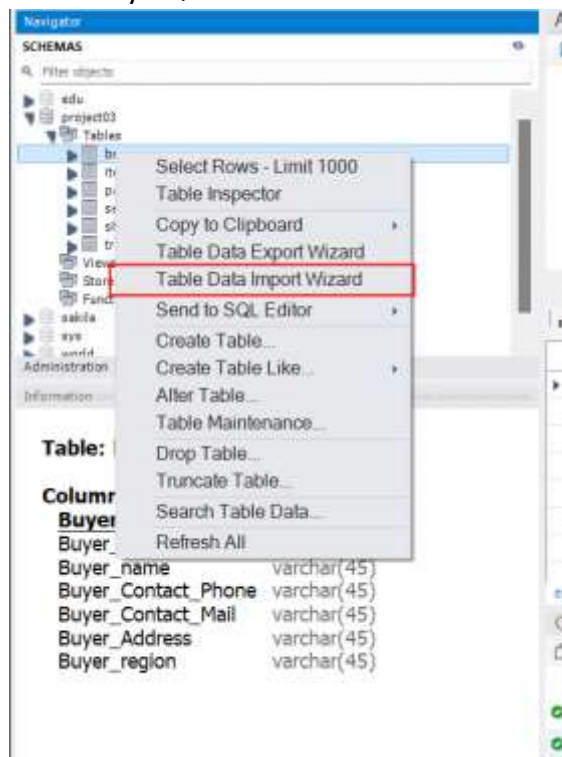


Figure 32 Step1-Import .csv file

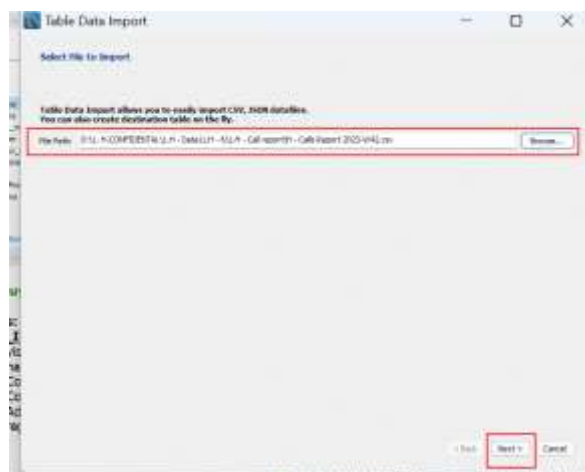


Figure 33 Step2 - Import .csv file

Import file into a new table

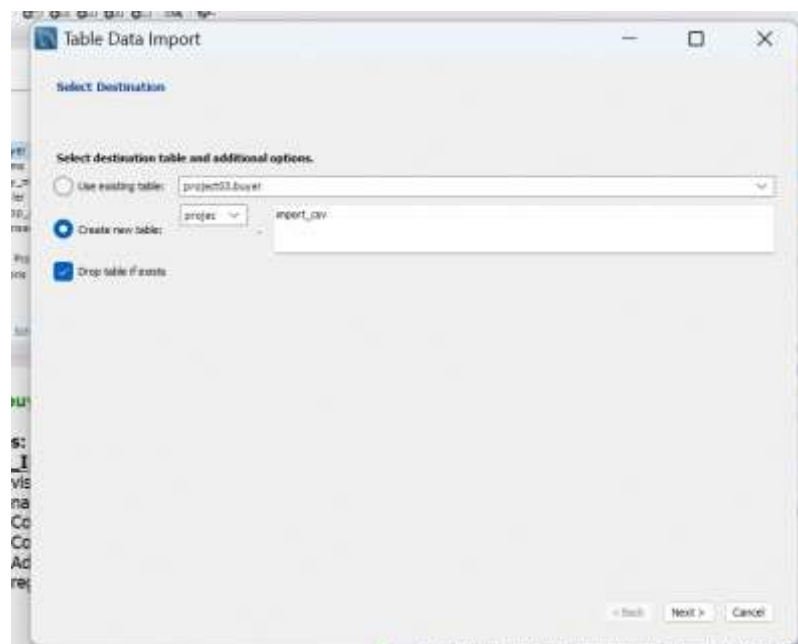


Figure 34 Step3 - insert csv into a new table

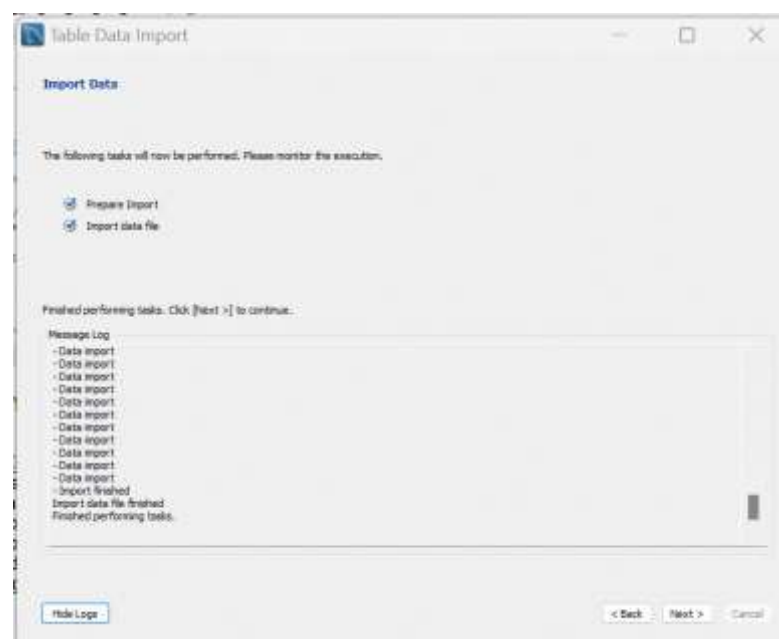


Figure 35 Import .csv processing

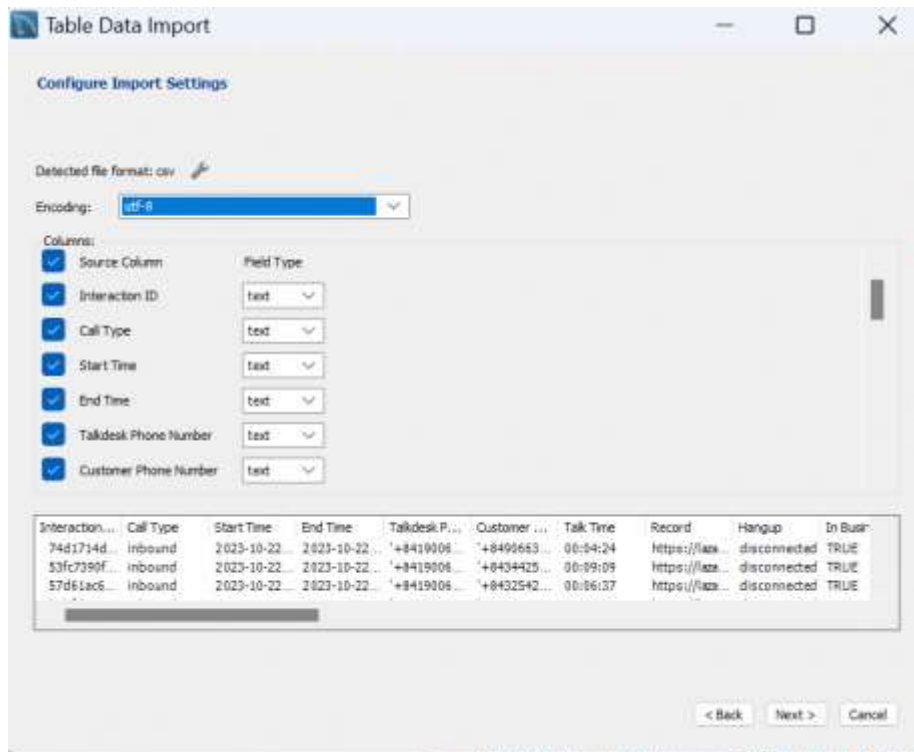


Figure 36 Declare the data format loaded from the .csv file

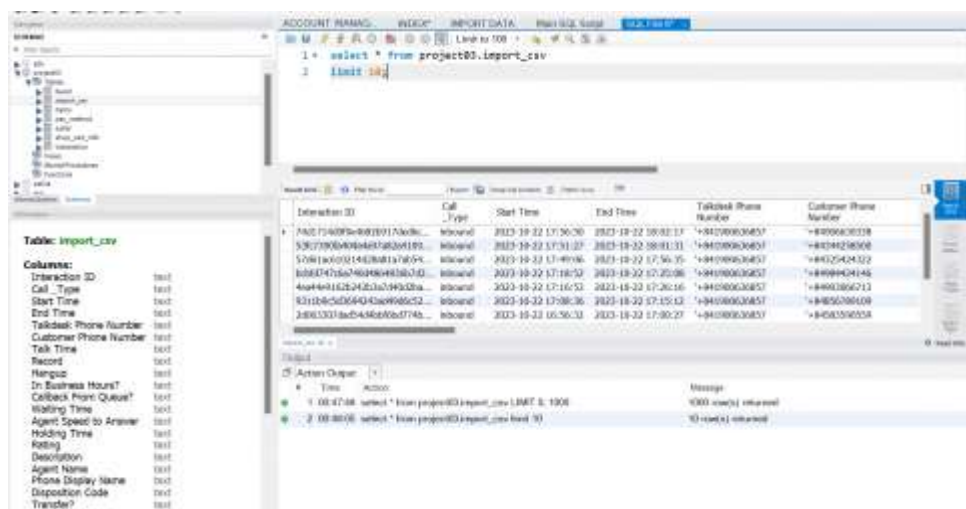


Figure 37 Complete the file loading process

