

VIETNAM NATIONAL UNIVERSITY, HANOI
INTERNATIONAL SCHOOL

**INS2055 – DATABASE SYSTEMS
PROJECT REPORT**

Tien Tho Bookstore's database management system

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TABLE OF CONTENTS

ABSTRACT	5
CHAPTER I: INTRODUCTION.....	6
1. ABOUT TIEN THO BOOKSTORE.....	6
2. METHODS FOR INVESTIGATING BUSINESS RULES	6
2.1. <i>Reading websites</i>	6
2.2. <i>Observations</i>	6
3. BUSINESS NARRATIVE.....	7
CHAPTER II: ANALYZING AND DESIGNING THE DATABASE	8
1. ERD.....	8
1.1. <i>Identify Entities</i> :.....	8
1.2. <i>Find Relationship</i>	9
2. RELATIONAL SCHEMA	9
3. SOME REAL DATA AND SQL SCRIPTS	12
CHAPTER III: SOME USEFUL REPORTS AND INFORMATION.....	13
1. SOME USEFUL REPORTS AND INFORMATION FOR REAL USAGE	13
CHAPTER IV: CONCLUSION.....	18
REFERENCES	19
APPENDIX	20

LIST OF FIGURES

Figure 1 – The 1st facility of Tien Tho Bookstore – 828 Lang street (source: thuonghieucongluan.com.vn/)	6
Figure 2 - Tien Tho's business process	7
Figure 3 - Tien Tho bookstore's Sale, Import and Managing ERD	8
Figure 4 - Relationships between entities	9
Figure 5 - Relational schema.....	10
Figure 6 - Real products data at Tien Tho bookstore	12
Figure 7 - Real stores data of Tien Tho.....	12
Figure 8 - Question 1.....	13
Figure 9 - Question 2.....	13
Figure 10 - Question 3.....	14
Figure 11 - Question 4.....	14
Figure 12 - Question 5.....	15
Figure 13 - Question 6.....	15
Figure 14 - Question 7.....	16
Figure 15 - Question 8.....	16
Figure 16 - Question 9.....	17
Figure 17 - Question 10.....	17

ABSTRACT

In this project, we are break down the Tien Tho Bookstore's database management system based on our own research and in our observation when we have shopping experience at Tien Tho Bookstore. With the knowledge learned in the Database Systems course and some references from online sources, we have completed this project with all the effort of each member.

Although Tien Tho Bookstore is a shopping-entertainment complex, in this project framework we focus only on the range of data on sale and import of books along with customers and employees data management of a single facility of Tien Tho bookstore (the first facility at 828 Lang street, Dong Da, HN) which are suitable for our ability.

Chapter I: INTRODUCTION

1. About Tien Tho Bookstore

Tien Tho Bookstore – self-identified as the largest bookstore system in the North of Vietnam – is a shopping-entertainment complex with a chain of 6 facilities with a large area up to thousands of square meters, both a place for people to satisfy their own needs and a space to help release personal emotions. Besides having many entertainment spaces, Tien Tho Bookstore also has countless useful books, from marketing books, English books, science books or fairy tales.



Figure 1 – The 1st facility of Tien Tho Bookstore – 828 Lang street (source: thuonghieucongluan.com.vn/)

2. Methods for investigating business rules

2.1. Reading websites

We learned about the operation process through the official website of Tien Tho bookstore: nhasachtientho.vn to learn about the items that Tien Tho bookstore provides to customers, product information, the information the customer needs to provide to determine the attributes for the report. We also learned about Tien Tho's business process through websites, but because the business process is not public, searching on the web site did not bring up many results.

Therefore, we decided to refer the [general business model of a bookstore](#) to make money to combine with other research methods to show the relationships of entities as well as more specific attributes

2.2. Observations

We have experienced buying a number of items and asked the staff there for some information we can provide about the management and import of Tien Tho bookstore. We can better visualize how the attributes are linked together in the store's network. These attributes are all given for the most convenient information retrieval. One more thing, Tien Tho's invoice also contains information that we

can use for the report. Through the process of observing the arrangement of products in the cabinets, it is also possible to infer that the management of product information right from import to sale is very strict.

3. Business narrative

No matter who you are, regardless of age, regardless of income level, when you come to Tien Tho bookstore you can find what you need, and each has a place to relax, rest, share. Tien Tho bookstore aimed to be the biggest bookstore chain in Vietnam, that makes us feel curious about their operations and business.

With a pretty good shopping experience at Tien Tho bookstore, we believe that this business has a large and very detailed database system, which makes it possible for them to get a good service and management. A large bookstore like Tien Tho certainly offer a wide variety of books, magazines and music selections. This includes just about every category literature, business, science, kids, hobbies, collectibles, and others. In addition, the types of stationery here are always very diverse and fulfillment, so we think these are Tien Tho's strong point.

Tien Tho bookstore is gradually asserting its position as the largest bookstore in the country and also gradually expanding into the entertainment segment. Although it is a large bookstore chain, Tien Tho is basically based on a very simple business rules as follows:

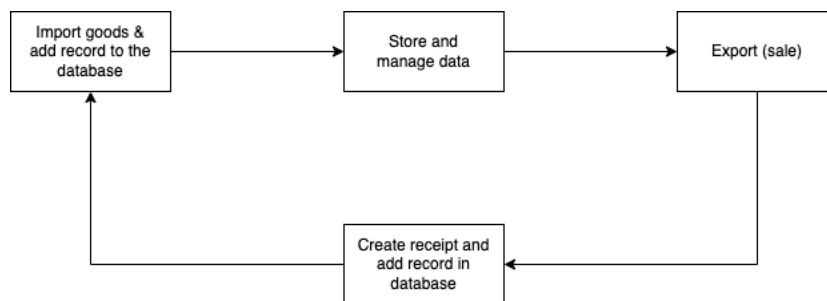


Figure 2 - Tien Tho's business process

Diagram about illustrate the Tien Tho's business process at each store branch, these are main steps:

- *Step 1:* Importing goods from suppliers and add some
- *Step 2:* Store goods and managing them in database system
- *Step 3:* Sale goods for the customers
- *Step 4:* Add record of every sale and create receipt for customer
- *Step 5:* Repeat the process

Chapter II: ANALYZING AND DESIGNING THE DATABASE

With all knowledge and experiences of us, after have some few researches and discusses, we come up to this database structure which described as ERD, Relational Schema and SQL scripts with data.

1. ERD

With 9 steps of creating ERD we can illustrate the database for Tien Tho's information management using the following ERD

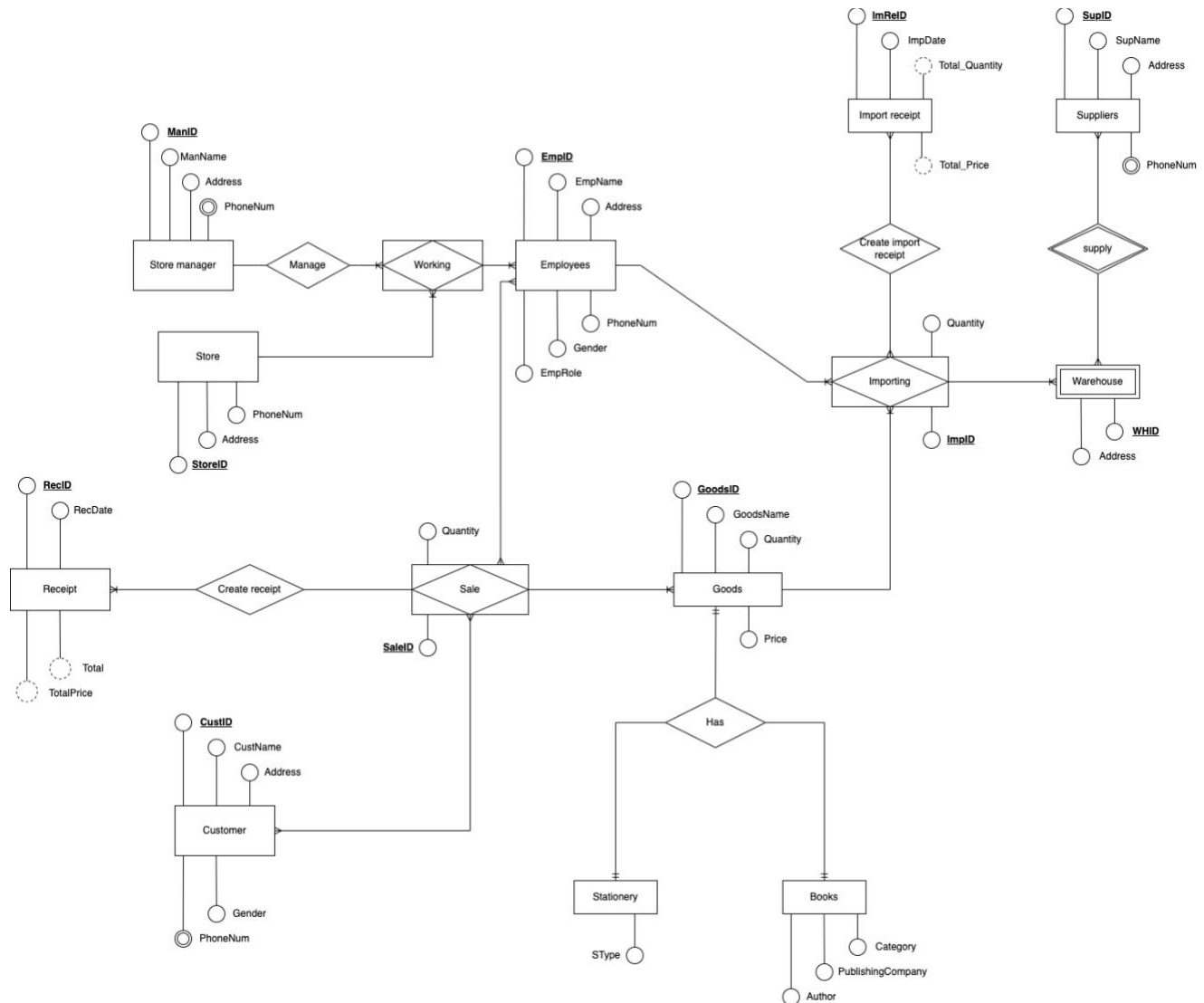


Figure 3 - Tien Tho bookstore's Sale, Import and Managing ERD ([view with the high resolution](#))

1.1. Identify Entities:

- *Store manager*: the manager of a store branch

- *Employees*: information of employees at a store branch (EmpID, EmpName, Address, PhoneNum, Gender, EmpRole)
- *Store*: information of stores and branches (StoreID, Address, PhoneNum)
- *Working*: the relation between employees and their manager shows who is in charge the employees with the specify roles
- *Receipt*: record of every sale for customers
- *Sale*: information about sale
- *Customer*: information about customers
- *Goods*: information about goods (ID, name, quantity, price)
- *Stationery*: types of stationery
- *Books*: more details about books (category, author, publishing)
- *Importing*: information about importing
- *Suppliers*: information about suppliers
- *Warehouse*: information about the warehouse branches of suppliers this entity identifies the nearest warehouse of each supplier help reduce the time consuming
- *Import receipt*: record of every imports

1.2. Find Relationship

There are 14 entities in our ERD and I have defined the relationships between these entities through the following table, relationships by column with row relation, entity from column with row relationship respectively contains relationship

	Store manager	Store	Working	Employees	Importing	Warehouse	Import receipt	Suppliers	Receipt	Sale	Goods	Customer	Stationery	Books
Store manager		Manage	working	Manage										
Store	Managed by			work										
Working	Managed by	mission of		mission of										
Employees	Managed by	work for			importing	import from	create import receipt		create receipt	completed	Sale, import	Sale for		
Importing				Imported by		import from	create import receipt				importing			
Warehouse				source of	importing		create import receipt	Supply by			importing			
Import receipt				create import receipt	create import receipt	create import receipt					create import receipt			
Suppliers						supply								
Receipt				create receipt						create receipt	create receipt	create receipt		
Sale				completed by					create receipt		sale	sale for		
Goods				sold by, imported by	import by	import from	create import receipt		create receipt	sold by		sale for	Has	has
Customer				Buy from					create receipt	Buy from	buy			
Stationery											belong to			
Books											be long to			

Figure 4 - Relationships between entities ([view with the high resolution](#))

2. Relational schema

With the ERD above include 14 entities, 5 multivalued attributes we converted into 19 relationship schemas:

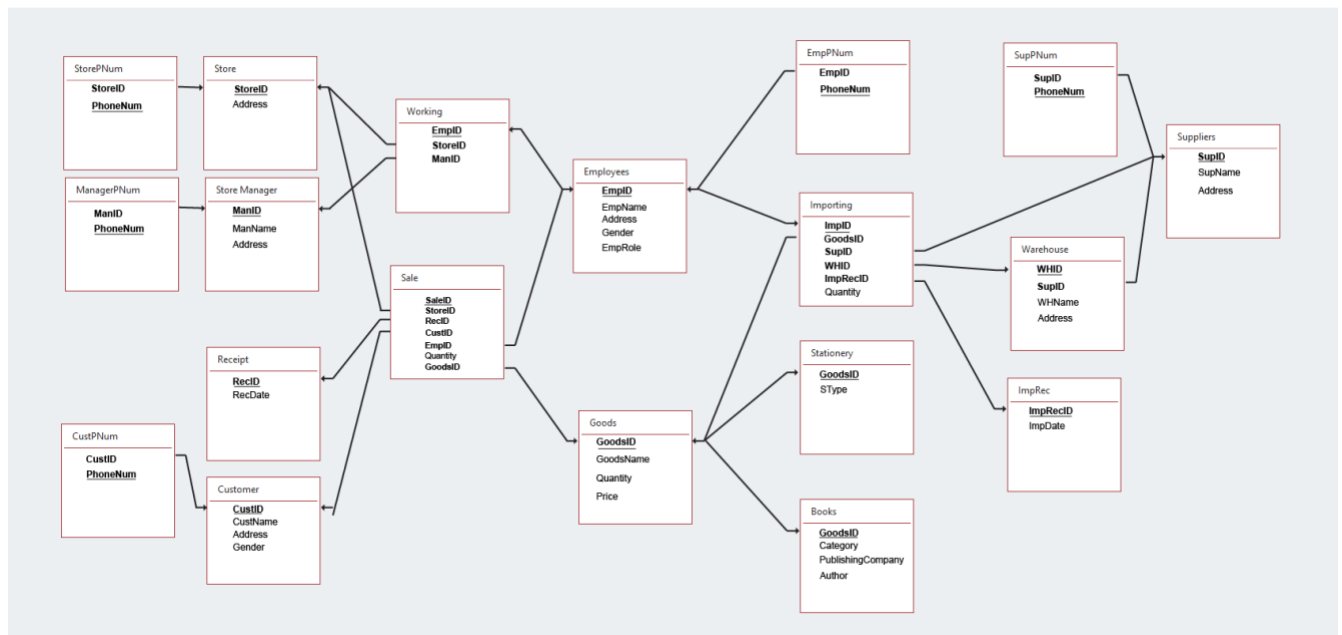


Figure 5 - Relational schema ([view with the high resolution](#))

- *Store Manager:*
 - Primary key: ManID
 - Attributes: ManName, Address, PhoneNum
- *ManagerPNum:*
 - Primary key: PhoneNum
 - Foreign key: ManID
- *Employees:*
 - Primary key: EmpID
 - Attributes: EmpName, Address, PhoneNum, Gender, EmpRole
- *Store:*
 - Primary key: StoreID
 - Attributes: Address
- *StorePNum:*
 - Primary key: PhoneNum
 - Foreign key: StoreID
- *Working:*
 - Primary key: EmpID
 - Foreign key: EmpID, StoreID, ManID
- *Receipt:*
 - Primary key: RecID
 - Attributes: RecDate
- *Sale:*

- Primary key: SaleID
- Foreign key: StoreID, RecID, CustID, EmpID, GoodsID
- Attributes: Quantity
- *Customer:*
 - Primary key: CustID
 - Attributes: CustName, Address, Gender
- *CustPNum:*
 - Primary key: Phone Num
 - Foreign key: CustID
- *Goods:*
 - Primary key: GoodsID
 - Attributes: Name, Quantity, Price
- *Stationery:*
 - Primary key: GoodsID
 - Foreign key: GoodsID
 - Attributes: SType
- *Books:*
 - Primary key: GoodsID
 - Foreign key: GoodsID
 - Attributes: Category, Author, Publishing
- *Importing:*
 - Primary key: ImpID
 - Foreign key: GoodsID, SupID, WHID, ImpRecID
 - Quantity
- *Suppliers:*
 - Primary key: SupID
 - Attributes: SupName, Address
- *SupPNum*
 - Primary key: PhoneNum
 - Foreign key: SupID
- *Warehouse:*
 - Primary key: WHID
 - Foreign: SupID
 - Attributes: WHName, Address
- *Import receipt:*
 - Primary key: ImpRecID
 - Attributes: ImpDate

3. Some real data and SQL scripts

We had used some real data from Tien Tho bookstore like the Goods table. Every row in the data of these tables is imported directly from Tien Tho bookstore's website.

```
290 • INSERT INTO Goods(GoodsID, GoodsName, Quantity, Price) VALUES('S62', 'Red Shiny Stamp Ink S62', '100', '38000');
291 • INSERT INTO Goods(GoodsID, GoodsName, Quantity, Price) VALUES('S63', 'Blue Shiny Stamp Ink S63', '100', '38000');
292 • INSERT INTO Goods(GoodsID, GoodsName, Quantity, Price) VALUES('TL108', 'Plastic Card Holder 1 Side Horizontal', '200', '2000');
293 • INSERT INTO Goods(GoodsID, GoodsName, Quantity, Price) VALUES('MDD', 'Leather Vertical Card Cover', '200', '5000');
294 • INSERT INTO Goods(GoodsID, GoodsName, Quantity, Price) VALUES('PWN1923', 'Photo Paper Double A A4 / 70 gsm', '30', '89000');
295 • INSERT INTO Goods(GoodsID, GoodsName, Quantity, Price) VALUES('PWN1935', 'Giấy Paper one A4/70', '30', '87000');
296 • INSERT INTO Goods(GoodsID, GoodsName, Quantity, Price) VALUES('PWN1864', '1912 oil wax 12 colors', '20', '58000');
297 • INSERT INTO Goods(GoodsID, GoodsName, Quantity, Price) VALUES('CM15BRS', 'Set of 15 Colormate Brushes CM-15BRS', '100', '106000');
298 • INSERT INTO Goods(GoodsID, GoodsName, Quantity, Price) VALUES('7418', '18 Color Crayons With Eraser', '500', '33000');
299 • INSERT INTO Goods(GoodsID, GoodsName, Quantity, Price) VALUES('PWN2539', 'Electrical Study Table Lamp LDL04 4W B650', '18', '695000');
300 • INSERT INTO Goods(GoodsID, GoodsName, Quantity, Price) VALUES('PWN905', 'Don Quixote', '75', '139500');
301 • INSERT INTO Goods(GoodsID, GoodsName, Quantity, Price) VALUES('PWN2275', 'Demons', '10', '85500');
302 • INSERT INTO Goods(GoodsID, GoodsName, Quantity, Price) VALUES('DRMHTNC', 'Doraemon Learning - Multiply and Divide', '200', '30000');
303 • INSERT INTO Goods(GoodsID, GoodsName, Quantity, Price) VALUES('DOCL-1', 'Selected Doraemon - 45 Chapters Opening the Doraemon Short Story', '50', '40000');
304 • INSERT INTO Goods(GoodsID, GoodsName, Quantity, Price) VALUES('100QLBBDCTKD', '100 Immutable Laws for Business Success', '20', '73800');
305 • INSERT INTO Goods(GoodsID, GoodsName, Quantity, Price) VALUES('100YTBHTH', '100 Great Selling Ideas', '20', '91800');
306 • INSERT INTO Goods(GoodsID, GoodsName, Quantity, Price) VALUES('PWN2635', 'IC3 Spark - Simple Computer Episode 2', '40', '50000');
307 • INSERT INTO Goods(GoodsID, GoodsName, Quantity, Price) VALUES('PWN2634', 'IC3 Spark - Online Life', '50', '43000');
308 • INSERT INTO Goods(GoodsID, GoodsName, Quantity, Price) VALUES('PWN1357', 'The Rats Sing Love Songs And Strange Stories From The World Of Science', '20', '162000');
309 • INSERT INTO Goods(GoodsID, GoodsName, Quantity, Price) VALUES('PWN955', 'Do Robots Dream About Electric Sheep?', '15', '103500');
```

Figure 6 - Real products data at Tien Tho bookstore

```
189 -- Based on real data of Tien Tho stores branch
190 • INSERT INTO Store (StoreID, Address) VALUES ('001', '828 Đường Láng, Đống Đa, Hà Nội');
191 • INSERT INTO Store (StoreID, Address) VALUES ('002', '36 Xuân Thủy, Cầu Giấy, Hà Nội');
192 • INSERT INTO Store (StoreID, Address) VALUES ('003', '424 Nguyễn Trãi, Thanh Xuân, Hà Nội');
193 • INSERT INTO Store (StoreID, Address) VALUES ('004', '697 Giải Phóng, Hoàng Mai, Hà Nội');
194 • INSERT INTO Store (StoreID, Address) VALUES ('005', '50 Nguyễn Thị Lưu, T.P Bắc Giang');
195 • INSERT INTO Store (StoreID, Address) VALUES ('006', '282a Lương Ngọc Quyến, Thái Nguyên');
196
197 -- Based on real data from nhasachtientho.vn
198 • INSERT INTO StorePNum (StoreID, PhoneNum) VALUES ('001', '0941234828');
199 • INSERT INTO StorePNum (StoreID, PhoneNum) VALUES ('002', '0934173636');
200 • INSERT INTO StorePNum (StoreID, PhoneNum) VALUES ('003', '0966688424');
201 • INSERT INTO StorePNum (StoreID, PhoneNum) VALUES ('004', '0933695697');
202 • INSERT INTO StorePNum (StoreID, PhoneNum) VALUES ('005', '0948555050');
203 • INSERT INTO StorePNum (StoreID, PhoneNum) VALUES ('006', '0906233282');
```

Figure 7 - Real stores data of Tien Tho

Chapter III: SOME USEFUL REPORTS AND INFORMATION

It's a couple of situations and professional questions that we've been asked to interrogate data that's useful for Tien Tho bookstore strategy, these data can be analyzed and generated changes in operation as well as causing the process to go smoothly. At the same time, the inquiries can also provide convenience for their clients, interest in the jobs of the processor of their clients, their employees and their businesses.

1. Some useful reports and information for real usage

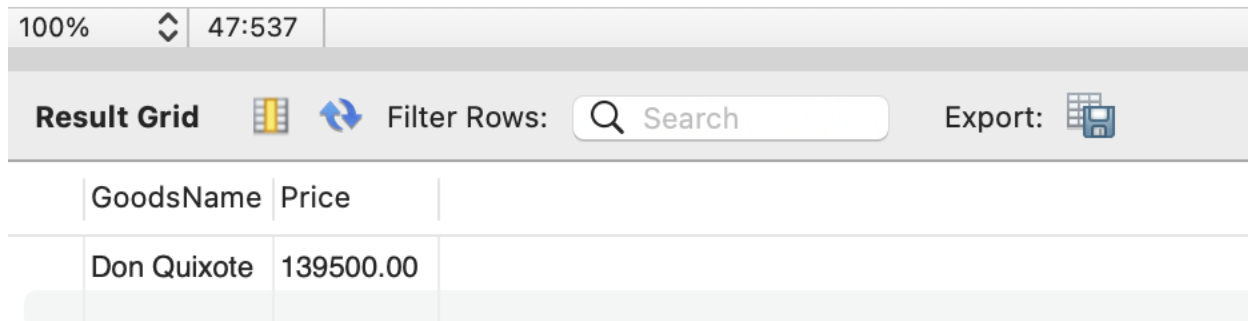
- Question 1: A customer ask for the price of the 'Don Quixote' books

537 -- Question 1: How much does Don Quixote cost?

538 • **SELECT** GoodsName, Price

539 **FROM** Goods

540 **WHERE** GoodsName = 'Don Quixote';



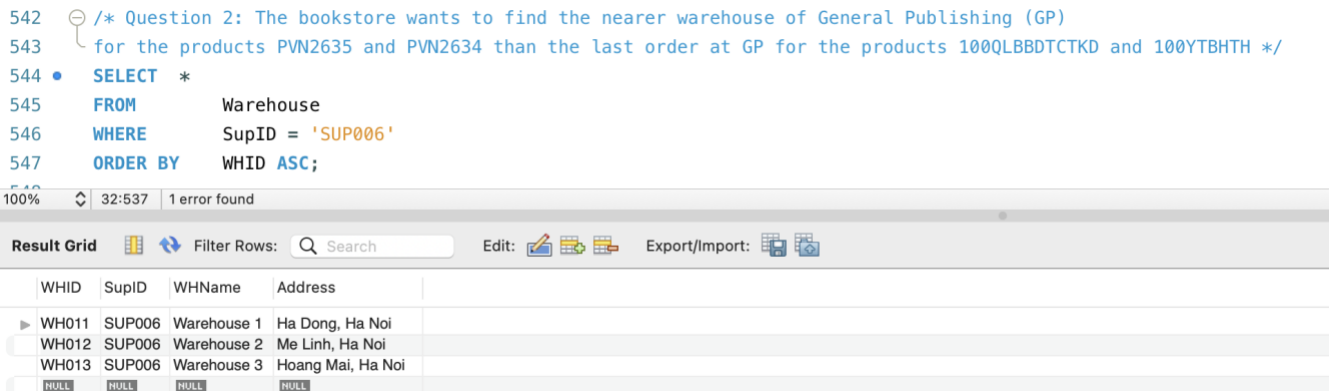
The screenshot shows a database query interface. At the top, there's a status bar with '100%' zoom, a refresh icon, and a timer '47:537'. Below it is a toolbar with 'Result Grid', a grid icon, a refresh icon, 'Filter Rows:', a search input field, and an 'Export:' button with a grid icon. The main area displays a table with two columns: 'GoodsName' and 'Price'. The table contains one row with the value 'Don Quixote' under 'GoodsName' and '139500.00' under 'Price'.

GoodsName	Price
Don Quixote	139500.00

Figure 8 - Question 1

➔ The answer is: 139.500 VND

- Question 2: The bookstore wants to find the nearer warehouse of General Publishing (GP) for the products PVN2635 and PVN2634 than the last order at GP for the products 100QLBBDTCTKD and 100YTBHTH



The screenshot shows a database query interface. At the top, there's a status bar with '100%' zoom, a refresh icon, a timer '32:537', and '1 error found'. Below it is a toolbar with 'Result Grid', a grid icon, a refresh icon, 'Filter Rows:', a search input field, an 'Edit:' button with a grid icon, and an 'Export/Import:' button with a grid icon. The main area displays a table with four columns: 'WHID', 'SupID', 'WHName', and 'Address'. The table contains three rows of data. The first row is 'WH011', 'SUP006', 'Warehouse 1', 'Ha Dong, Ha Noi'. The second row is 'WH012', 'SUP006', 'Warehouse 2', 'Me Linh, Ha Noi'. The third row is 'WH013', 'SUP006', 'Warehouse 3', 'Hoang Mai, Ha Noi'. There are also some 'NULL' values in the first column of the first three rows.

WHID	SupID	WHName	Address
WH011	SUP006	Warehouse 1	Ha Dong, Ha Noi
WH012	SUP006	Warehouse 2	Me Linh, Ha Noi
WH013	SUP006	Warehouse 3	Hoang Mai, Ha Noi

Figure 9 - Question 2

➔ There are three warehouses of GP and the first facility is at the 828 Lang street so the nearest warehouse of GP is the Warehouse 1 – Ha Dong is the nearest place to Lang street.

- Question 3: Customer ID 'C00002' just bought 2 products 'PVN905' and 'PVN2275' want to create a receipt, so what information will be printed on the receipt?

```

549 -- Question 3: Customer ID 'C00002' just bought 2 products 'PVN905' and 'PVN2275' want to create a receipt, so what information will be printed on the receipt?
550 • SELECT      S.SaleID, R.RecID, S.StoreID, S.CustID, S.GoodsID, G.GoodsName, S.Quantity, G.Price
551 FROM          Sale S, Receipt R, Goods G
552 WHERE         S.CustID = 'C00002'
553 AND           S.RecID = R.RecID
554 AND           S.GoodsID = G.GoodsID
555 ORDER BY      RecDate ASC;

```

SaleID	RecID	StoreID	CustID	GoodsID	GoodsName	Quantity	Price
S00002	REC002	001	C00002	PVN905	Don Quixote	1	139500.00
S00003	REC002	001	C00002	PVN2275	Demons	1	85500.00

Figure 10 - Question 3

➔ The receipt displayed SaleID, RecID, StoreID, CustID, GoodsID, GoodsName, Quantity and Price

- Question 4: The author of the book has ID: PVN2275 want to contact the customers who bought this book to show gratitude and need to retrieve the customer's phone number

```

557 -- Question 4: The author of the book has ID:
558 • SELECT      S.CustID, C.PhoneNum
559 FROM          Sale S, CustPNum C
560 WHERE         S.GoodsID = 'PVN2275'
561 AND           C.CustID = S.CustID
562 ORDER BY      CustID ASC;
563

```

CustID	PhoneNum
C00002	458939230
C00002	982838442

Figure 11 - Question 4

➔ These are two phone numbers of C00002 whom bought the book has ID: PVN2275

- Question 5: Count the gender of employees in store

```

564  -- Question 5: Count the gender of employees in store
565  •  SELECT      Gender, COUNT(*)
566      FROM      Employees
567      GROUP BY   Gender;

```

Gender	COUNT(*)
M	16
F	8

Figure 12 - Question 5

- ➔ There are 16 Male employees and 8 Female employees, coincidentally the Male employees are double the Female employees.

- Question 6: Find the best saler of the month

```

569  -- Question 6: Find the best saler of the October
570  •  SELECT      S.EmpID, E.EmpName, COUNT(*)
571      FROM      Sale S, Employees E, Receipt R
572      WHERE      S.EmpID LIKE 'EMP00%'
573      AND         S.EmpID = E.EmpID
574      AND         R.RecID = S.RecID
575      AND         RecDate BETWEEN '2021/10/01' AND '2021/10/31'
576      GROUP BY   S.EmpID, E.EmpName;

```

EmpID	EmpName	COUNT(*)
EMP001	Do Tuan Dung	6
EMP002	Dao Thanh Hang	2
EMP003	Pham Hoang Hiep	3
EMP004	Nghiem Xuan Toan	3

Figure 13 - Question 6

- ➔ Employees with ID EMP005 – Do Tuan Dung is the best saler of the October

- Question 7: The total number of customers who have visited the store in November

```

578  -- Question 7: The total number of customers who have visited the store in November
579  • SELECT      COUNT(*)
580  FROM          Receipt
581  WHERE         RecDate BETWEEN '2021/11/01' AND '2021/11/30';

```

100% 50:569

Result Grid Filter Rows: Search Export:

COUNT(*)
6

Figure 14 - Question 7

→ Create a receipt each customer so there are 6 customers in November

- Question 8: Find the name and phone number of the customer who has the most pays in December at store to create a Premium Membership card

```

585  -- Question 8: Find the name and phone number of customer who has the most pays in December at store to create a Premium Membership card
586  • SELECT      S.CustID, C.CustName, CP.PhoneNum, COUNT(*)
587  FROM          Sale S, Customer C, CustPNum CP, Receipt R
588  WHERE         S.RecID = R.RecID
589  AND           C.CustID = S.CustID
590  AND           CP.CustID = S.CustID
591  AND           RecDate BETWEEN '2021/11/30' AND '2021/12/31'
592  GROUP BY     S.CustID, C.CustName, CP.PhoneNum;

```

100% 19:583

Result Grid Filter Rows: Search Export:

CustID	CustName	PhoneNum	COUNT(*)
C00016	Tung	823273749	2
C00017	Hoa	928337472	1
C00019	Quynh	782383923	1
C00020	Phuong	493230348	1
C00020	Phuong	823772312	1

Figure 15 - Question 8

→ Tung had the most pays in December at store

- Question 9: Bookstore plan to promote best-selling products to increase sales. Find out top best-selling books


```

592  -- Question 9: Bookstore plan to promote best-selling products to increase s
593  •  SELECT      S.GoodsID, G.GoodsName, COUNT(*)
594  FROM      Sale S, Goods G, Receipt R
595  WHERE      R.RecDate BETWEEN '2021/11/30' AND '2021/12/31'
596  AND      S.GoodsID = G.GoodsID
597  AND      S.RecID = R.RecID
598  GROUP BY  S.GoodsID, G.GoodsName
599  ORDER BY  COUNT(*) DESC;

```

100% 26:587

Result Grid			
Filter Rows: <input type="text" value="Search"/> Export:			
	GoodsID	GoodsName	COUNT(*)
▶	PVN905	Don Quixote	2
▶	PVN2539	Electrical Study Table Lamp LDL04 4W B650	2
▶	TL108	Plastic Card Holder 1 Side Horizontal	1
▶	DOCL-1	Selected Doraemon - 45 Chapters Opening the...	1

Figure 16 - Question 9

➔ Don Quixote is the best-selling books and Electrical Study Table Lamp is the best-selling Stationery

- Question 10: Find where have the least customer to create a marketing campaign in that place to increase brand awareness in places with few customers

```

601  -- Question 10: Find where have the least customer to create a marketing campaign in that place to boost the sale
602  •  SELECT      Address, COUNT(*)
603  FROM      Customer
604  GROUP BY  Address
605  ORDER BY  COUNT(*) ASC;

```

100% 9:594

Result Grid		
Filter Rows: <input type="text" value="Search"/> Export:		
	Address	COUNT(*)
▶	Ha Dong, Ha Noi	1
▶	Cau Giay, Ha Noi	1
▶	Ha Noi	1
▶	Dong Da, Ha Noi	1
▶	Tran Duy Hung, Cau Giay, Ha Noi	1
▶	Dao Duy Tu, Hoan Kiem, Ha Noi	1
▶	Phu Xuyen	1
▶	Vinh Phuc	1
▶	Long Bien, Ha Noi	1
▶	Ba Dinh, Ha Noi	1
▶	Yen Bai	1
▶	Lang Son	1
▶	Bac Giang	1
▶	Tay Ho, Ha Noi	1
▶	Lai Chau	1
▶	Ha Dong, HN	1
▶	Tu Liem, Ha Noi	2
▶	Hung Yen	2

Figure 17 - Question 10

➔ Not enough data but from the top to end is the least customers to most customers.

Chapter IV: CONCLUSION

The database that we have analyzed and built is based on the information that we have done our best to find, but the process of understanding is very difficult both from the epidemic factor and because Tien Tho bookstore cannot completely publicize their system, Therefore, this database system is not completely 100% accurate compared to reality, but this is still the most basic data frame for Tien Tho bookstore to operate smoothly. In addition, it also takes us a lot of time to come up with possible scenarios and make it the most reasonable way that this system can handle as well as solve. There are many changes as well as the effort to make this system the most complete, but errors are absolutely inevitable, hopefully the teacher can contribute to the amendment and can see our efforts through the refinement of this report.

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APPENDIX

All of our works:

<https://drive.google.com/drive/folders/1sme2JDRcPm9e4rv5WYKSO8DFOtKG1BpG?usp=sharing>