CPCS241-Database I-Spring2020-Project

[Library Management System]

Problem Description and Analysis

Group No: 4

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Contents

PART I: Analysis

1 Problem Definition and Data Requirements

1.1 Problem Description

The library is an organized group of knowledge resources that are available for viewing, purchasing and borrowing. They are regulated for use and looked after by our staff, some volunteers, and our distinguished system of various services. In addition to providing materials, this library has rooms for presenting seminars, booking study rooms. And a membership feature that enables the member to book a study room.

The library can have a lot of administrative issues, such as the library management cannot guarantee the safe return of books because the borrower's information may be difficult to find or completely lost. Not registering purchases, which causes financial problems for the library management. Searching for a book may take a long time and may be a complex procedure that no client will bear, also there will be difficulty in searching for the information of the previous client when needed, and this will lead to time delay and disruption of work.

Therefore, we will create a database to solve these problems and provide the best services to the customer regarding the **data requirements** and **business rules** for the management of the library.

1.2 Data Requirements

- **Book Entity**
    1. ISBN: a unique ISBN (like ID) for each book
    2. BName: the name of the Book
    3. BPrice: the price of the book
    4. PublishingYear: the publishing year of the book
    5. CopyNum: number of copies of the book

- **Section Entity**
    1. SecID: a unique ID for each section
    2. SecName: the name of the section

       NOTE: There are two derived attributes:
       *numOfEmp – number of employees -
       *numOfBooks – number of books -
       we will deal with them later at implementation phase.

- **Customer Entity**
    1. CID: a unique ID for each customer
    2. CFirst: the first name of the customer
    3. CLast: the last name of the customer
    4. CSex: the gender of the customer
    5. CBirthD: the birth date of the customer
    6. CPhone: the phone number of the customer
    7. CAddress: the address of customer

    NOTE: There is one derived attribute:
    *CAge – the age of the customer -
    we will deal with it later at implementation phase.

- **Employee Entity**
    1. EID: a unique ID for each employee
    2. EFirst: the first name of employee
    3. ELast: the last name of employee
    4. ESex: the gender of the employee
    5. ESalary: salary of the employee
    6. EEmail: Email of the employee
    7. EPhone: the phone number of employee
    8. EAddress: the address of employee
    9. EBirthD: the birth date of the employee

       NOTE: There is one derived attribute:
       *EAge – the age of the employee -
       we will deal with it later at implementation phase.

- **Instructor Entity**
    1. TraininglicenseNum: the number of training license

       *NOTE: this entity is a subclass of superclass (Employee)

- **StudyRoom Entity**
    1. SR_ID: a unique ID for each room
    2. SR_size: the size of room
    3. SR_price: the price of room per hour
    4. FloorNum: the floor number of the room

- **Author Entity**
    1. AID: a unique ID for each author
    2. AFirst: the first name of author
    3. ALast: the last name of author
    4. ASex: the gender of the author

- **Seminar Entity**
    1. SID: a unique ID for each seminar
    2. SDate: the date of seminar
    3. SDay: the day of the seminar
    4. STitle: the title of seminar
    5. STime: the time of seminar

    NOTE: There is one derived attribute:
    *numOfCus -number of customers –
    we will deal with it later at implementation phase

- **Volunteer Entity**
    1. VID: a unique ID for each volunteer
    2. VFirst: the first name of volunteer
    3. VLast: the last name of volunteer
    4. VAge: the the age of volunteer
    5. VAddress: the address of the volunteer
    6. Qualifications: the qualifications of the volunteer (multivalued)

- **Membership Entity**
    1. MemShID: a unique ID for each membership
    2. MemShName: the name of membership
    3. MemShPrice: the price of membership

- **Certificate Entity**
    1. certifiPrice: the price of certificate

    NOTE: this entity is a weak entity, its owner is a Volunteer entity

1.3 Business Rules

- **Book Rules**

  - Each book has a unique ID
  - Each book must be available in the system
  - Each book belongs to one section
  - The book may be written by more than one author
  - Each book must be written by at least one author
  - Each book will have a published year

- **Author Rules**

  - Every author must have a unique ID
  - Every author must have written at least one book in the system
  - An author can write more than one book
  - Every author must have first and last name

- **Employee Rules**
  - Each employee must have a unique ID
  - An employee may be an instructor
  -Each employee must be responsible for one section
  - Each employee must have first and last name and phone number

- **Instructor Rules**
  - Each instructor has a unique ID
  - Every instructor must be an employee
  - Every instructor will have a different training license
  -Every instructor must present only one seminar

- **Customer Rules**
  - Each customer must have a unique ID
  - Customers can purchase and borrow as many books as they want
  - Each customer can be a member
  - Every customer can attend more than one seminar
  - Customers must have first and last name

- **Member Rules**
  - Every member will have a unique member
  - Every member has only one membership
  - A member can reserve many study rooms

- **Membership Rules**
  - Each membership is for one member only
  - Each membership has a name and a certain price
  - The name of the membership specifies its price

- **Volunteer Rules**
  - Every volunteer has a unique ID
  - To volunteer, the volunteer age must be over 15 years' old
  - Every volunteer must volunteer at (at least) one section
  -A volunteer can take more than one certificate
  - A volunteer must enter his first and last name and his age

- **Certificate Rules**
  -To obtain a volunteer certificate, the volunteer must volunteer any number of hours
  - A certificate is only for one volunteer
  - Every certificate has a price

- **Seminar Rules**
  - Each seminar has a unique ID
  - Every seminar must have a title and date
  - Seminars are presented by one instructor or more than one instructor
  - Seminars can be attended by many customers

-Each seminar must have presented by at least one instructor
-Each seminar must contain at least one customer

- **StudyRoom Rules**
  - Each studying room has a unique ID
  - Only members can take a studying room
  -Every member can take more than one study room
  -A study room can reserve\take by many members
  - The room must be available to be booked
  -Every study room has a size and floor number
  -The size of each study room specify its price

- **Section Rules**
  - Each section has a unique ID
  - Every section must have at least one employee
  - Each section may have some volunteers who work there
  - Every section must have a name

1.4 Intended Output of the system

- The system will facilitate the control of data organization, storage and management.
- All employees, customers, books, borrowers, authors, volunteers, instructors and seminars are stored in the system and can be consulted quickly.
- Our system will search all the book database and find the required book within a few seconds.
- Customers will be allowed to get a membership
- Customers will be allowed to attend the seminar which is conducted in the library provided by the instructor.
- It will also deal with members(customer) who request a study room and by booking it, the room size and price will be determined.
- Volunteers will only be allowed to work in the books section and they will receive a certificate based on their volunteering.

The outputs divide into queries and transactions:

<u>Queries:</u>
Search for the books that belong to a specific section\s
Display the books whose names begins with a specific letter\s
Search for the books that specific customer/s bought
Search for the books by their price (display the books that have priced more/less (any price))
Search for the books by their author name (first / last / first and last name)
Display the books whose names contain a specific word/s
Search for the books that have a specific number of copies
Search for the books that were published in a specific year/s

Display the authors who are female/male (display authors by their gender)
Display all the seminars that were presented on a specific day/date
Display the customers that were attended a specific seminar/s
Display the seminars that were presented by a specific instructor/s
Count number of customers of specific seminar/s
Search for the volunteers who volunteer at a specific section
Display the volunteers whose age is greater than / less than/between a specific value/s
Display the qualifications of a specific volunteer/s
Search for the certificates of a specific volunteer
Display the employees whose salary is between / more than / less than a specific value
Display the employees who are female/male
Search for the employees who are responsible for a specific section
Search for the employees who are from a specific address
Display the employees who are an instructor
Search for the members who have a specific type of membership
Search for the members who pay a specific price for a membership
Display the members who reserve a study room based on a specific floor / size
Display the members who take a study room based on a specific date

Transactions:

INSERT:

Insert a customer
Insert a book
Insert a volunteer
Insert a seminar
Insert an instructor
Insert an author
Insert a member
Insert a certificate
Insert a new study room
Insert a book section
DELETE:
Delete customer
Delete a book
Delete a volunteer
Delete a seminar
Delete an instructor
Delete an author
Delete a member
Delete a certificate
Delete a new study room
Delete a book section
UPDATE:
Update the phone number of a specific customer
Update the phone number of a specific employee

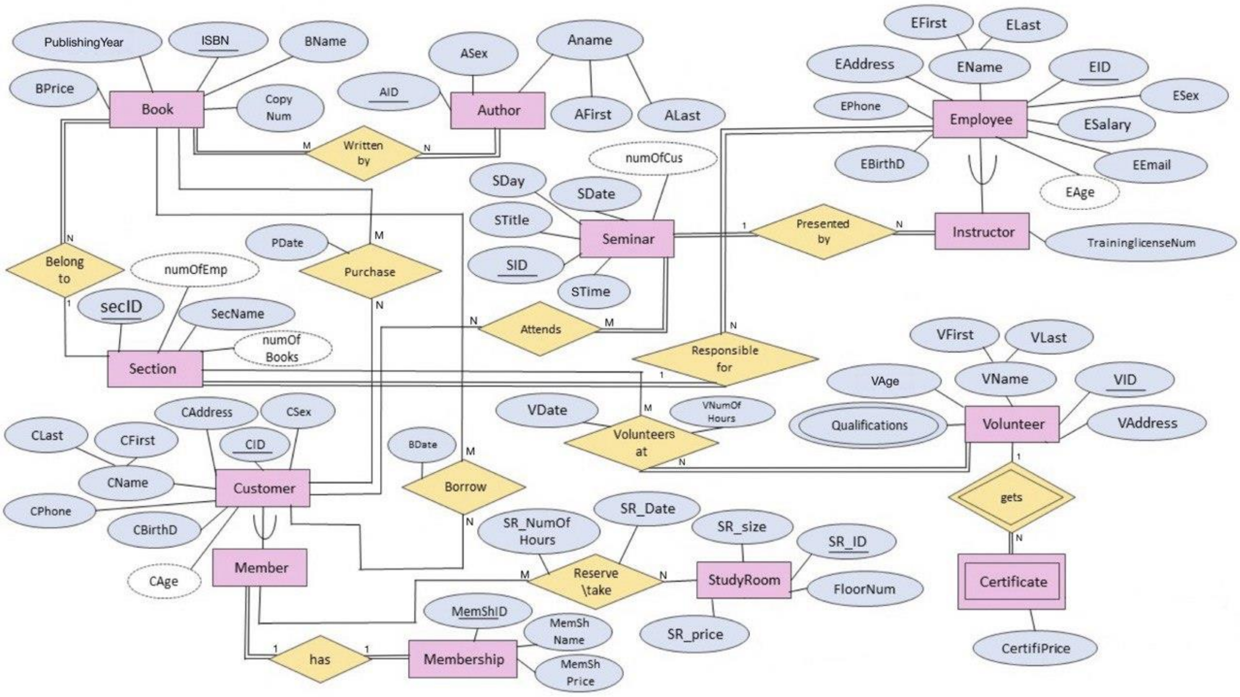
Update the price of a specific book
Update the price of a specific type of study room
Update the price of a specific certificate
Update the qualifications of a specific volunteer
Update the date / day / time of a specific seminar
Update the address of a specific employee / customer
Update the email of a specific employee
Update the date of reserving a specific study room

NOTE: these outputs like a sample.
We will deal with the outputs at the implementation phase.

PART II: DB DEISGN

2 ER Diagram Design

2.1 ER diagram



2.2 Design of Business Rules

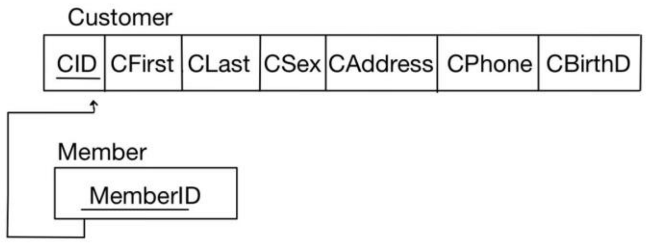
Business Rule	Design Decisions	Justification (if any)
A book can be written by many authors	M:N relationship between BOOK and AUTHER	The book can be written by many authors, also the authors can write many books All books must have an author\s, and also all authors must write a book\s. This relationship has a total participation on both entities book and author
Each book belong to one section only	N:1 relationship between BOOK and SECTION	The book only belongs to one section, but the section can have many books All book must belong to one section, but not all sections must have books. This relationship has a total participation on book entity and a partial participation on section entity
Customer can buy (purchase)any number of (many) books	M:N relationship between BOOK and CUSTOMER	The customer can buy many books, and the book can have bought by many customers Not all customer must buy book\s and not all books must be bought by customers. This relationship has a partial participation on both entities book and customer.
A customer can attend any number of (many) seminars	M:N relationship between SEMINAR and CUSTOMER	The customer can attend many seminars at different time, and the seminars can have many customers Each seminar must have customer\s, but not all customers must present\take a seminar. This relationship has a total participation on seminar entity and a partial participation on customer entity
Every employee responsible for one section only	1:N relationship between SECTIONS and EMPLOYEE	The employee responsible for one section only, and each section contains at least one (many) employee\s.

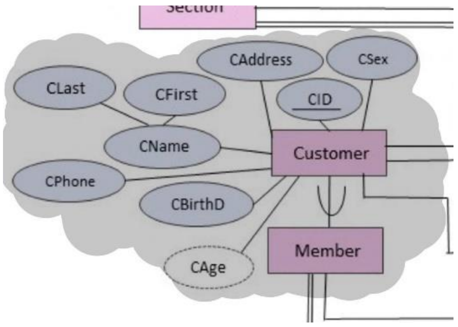
		All employees must have a section they are responsible for, and all sections must have employee\s. This relationship has a total participation on both entities section and employee
Each instructor can present only one seminar	1:N relationship between SEMINAR and INSTRUCTOR	The instructor presents one seminar only, but the seminar can have presented by many instructors All instructors must have a seminar\s to present, and all seminars must have an instructor\s to presented it. This relationship has a total participation on both entities seminar and instructor
Each volunteer can volunteer at many section	M:N relationship between Section and VOLUNTEER	The volunteer can volunteer at more than one (many) sections, and the section can have many volunteers All volunteers must volunteer at a section/s, but not all sections contain\have volunteers. This relationship has a total participation on volunteer entity and a partial participation on sections entity.
Customer can borrow any number of(many) books	M:N relationship between BOOK and CUSTOMER	The customer can borrow many books, and the book can be borrowed by many customers. Not all customers must borrow a book\s and not all book should be borrowed by customer\s. This relationship has a partial participation on both entities book and customer.
Each member can reserve many study rooms	M:N relationship between MEMBER and STUDYROOM	A member can reserve\take more than one (many) study room\s, and a study room can reserve by many members. Not all member must have a study room, and also not all study room must be token by a member. This relationship is a partial participation on both entities member and study room

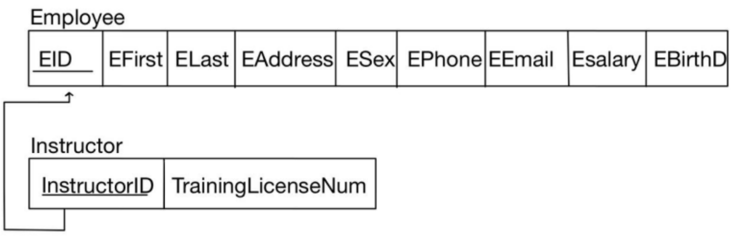
Each member has one membership only	1:1 relationship between MEMBER and MEMBERSHIP	Every member has only one membership, and each membership is for one member only All members must have a membership, and all membership must belong to only one member. This relationship is a total participation on both entities member and membership
A volunteer can get more than one (many) certificates	1:N week relationship between VOLUNTEER and CERTIFICATE	Each volunteer can take more than one (many) certificates, but each certificate belongs to one volunteer only. Not all volunteer must have a certificate\s but each certificate must belong to\has one (a specific) volunteer.

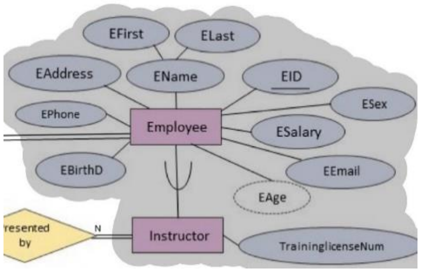
3 ER-to-logical schema mapping

3.1 Mapping of Regular Entity Types



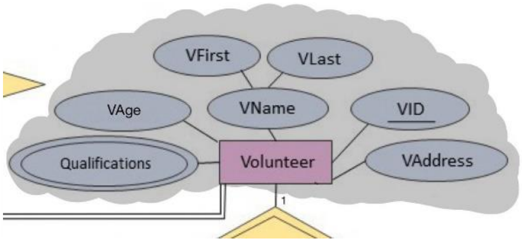






Volunteer

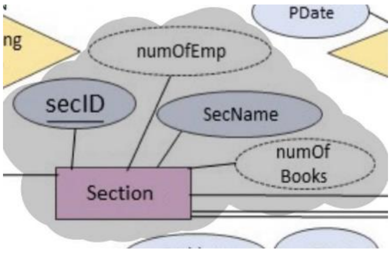
VID	VFirst	VLast	VAddress	VAge



(Qualifications attribute has a distinct mapping)

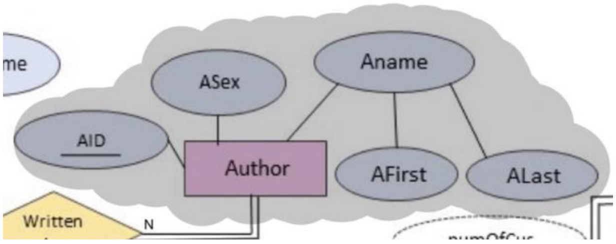
Section

SecID	SecName



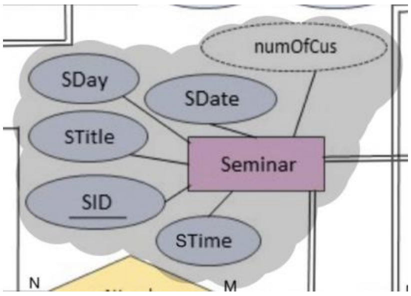
Author

AID	AFirst	ALast	ASex



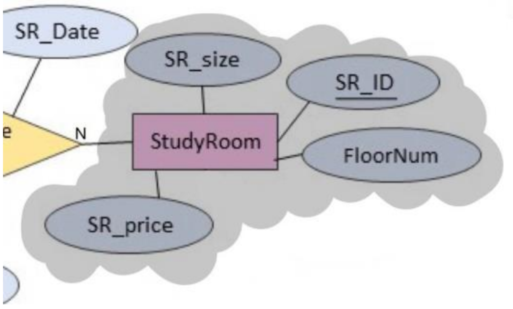
Seminar

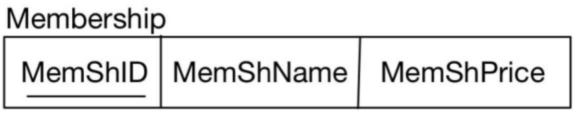
SID	STitle	SDate	SDay	STime



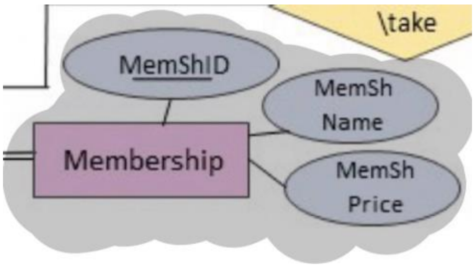
StudyRoom

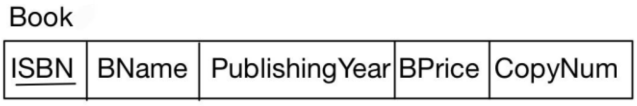
SR_ID	SR_size	SR_price	FloorNum



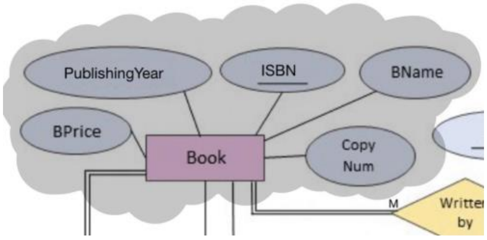

Membership

MemShID	MemShName	MemShPrice

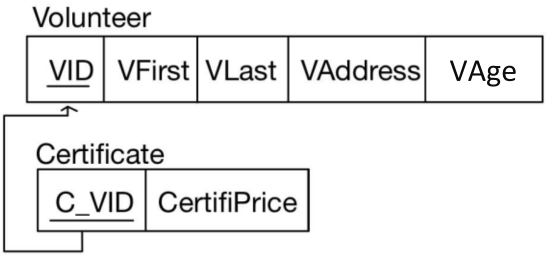



Book

ISBN	BName	PublishingYear	BPrice	CopyNum



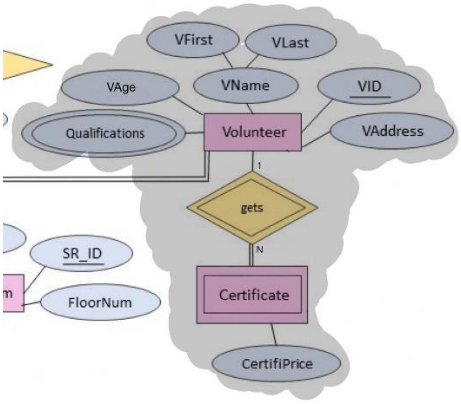
3.2 Mapping of Weak Entity Types


Volunteer

VID	VFirst	VLast	VAddress	VAge

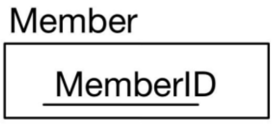
Certificate

C_VID	CertifiPrice

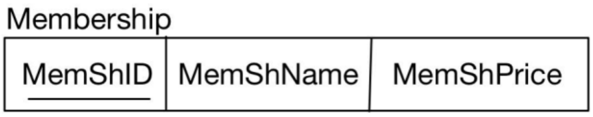


3.3 Mapping of binary 1-1 relationship types

The best way to mapping 1:1 relationship with total participation (two entities have total participation) is: a merged relation. I will choose the PK of member relation to be a PK of a merged relation, the PK of membership relation will be CANDIDATE KEY (UNIQUE) in the merged relation.


Member

MemberID

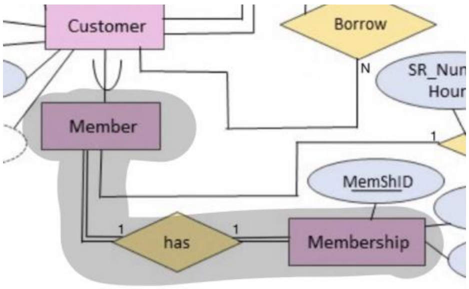

Membership

MemShID	MemShName	MemShPrice

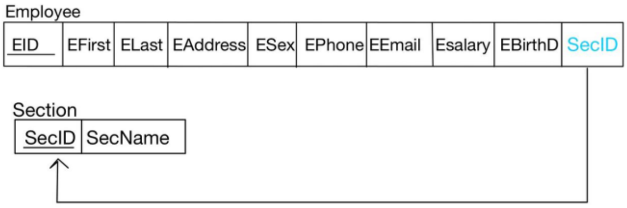
After merging two relations:

MembershipOfMember

MemberID	MemShID	MemShName	MemShPrice



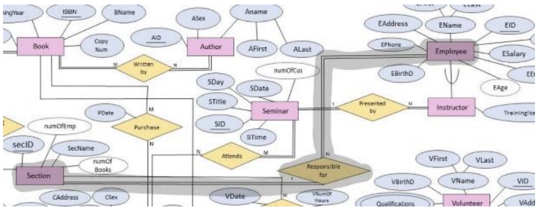
3.4 Mapping of binary 1-N relationship types

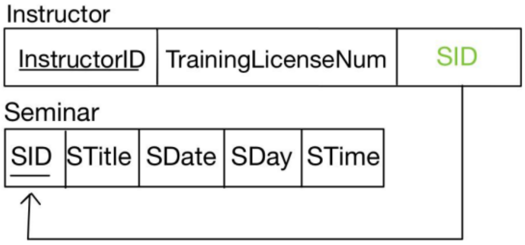

Employee

EID	EFirst	ELast	EAddress	ESex	EPhone	EEmail	Esalary	EBirthD	SecID

Section

SecID	SecName

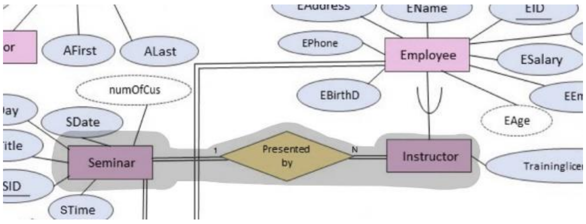


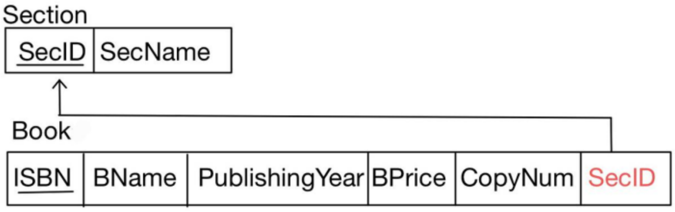

Instructor

InstructorID	TrainingLicenseNum	SID

Seminar

SID	STitle	SDate	SDay	STime

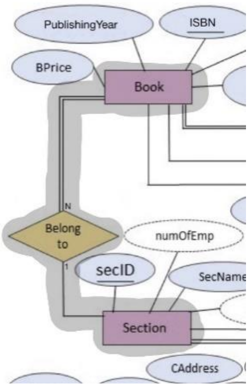



Section

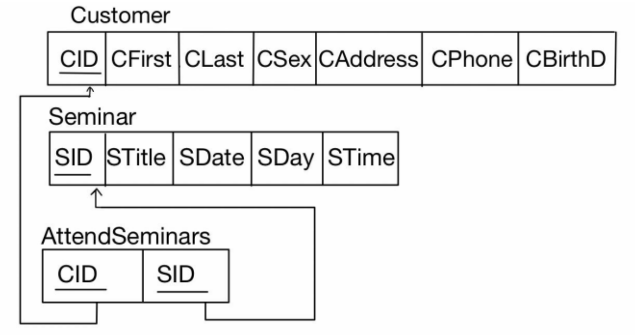
SecID	SecName

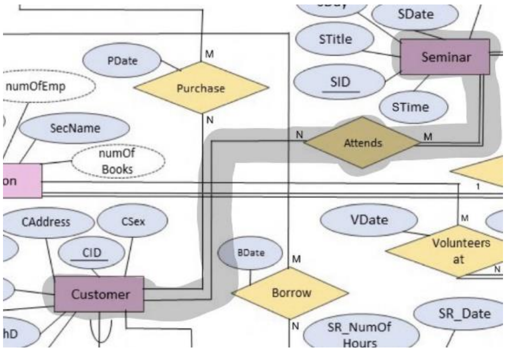
Book

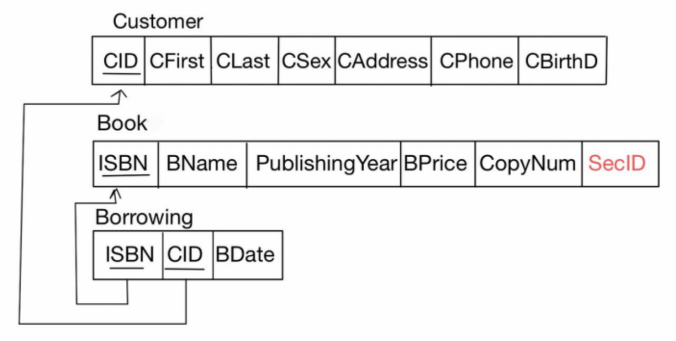
ISBN	BName	PublishingYear	BPrice	CopyNum	SecID

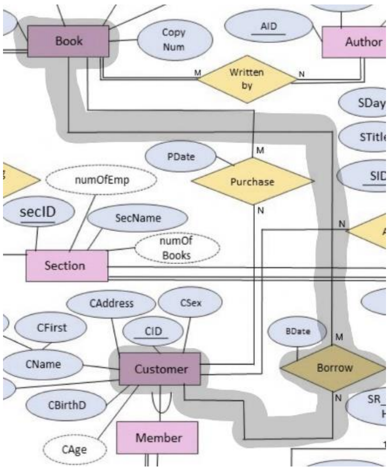


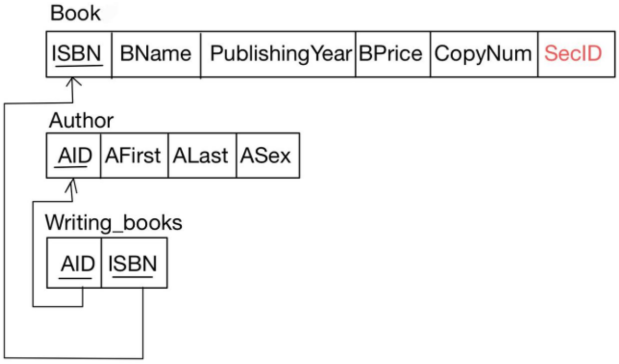
3.5 Mapping of binary M-N relationship types

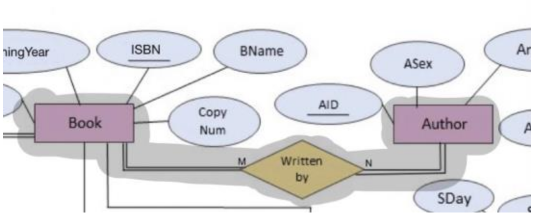


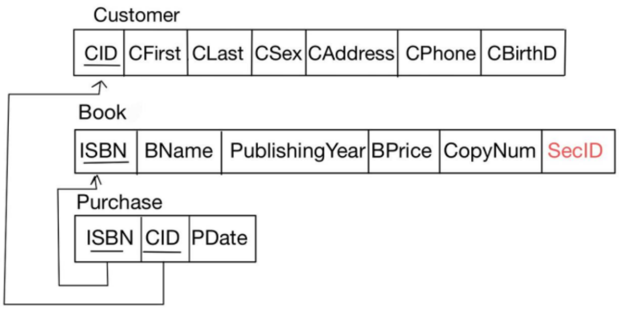












Customer

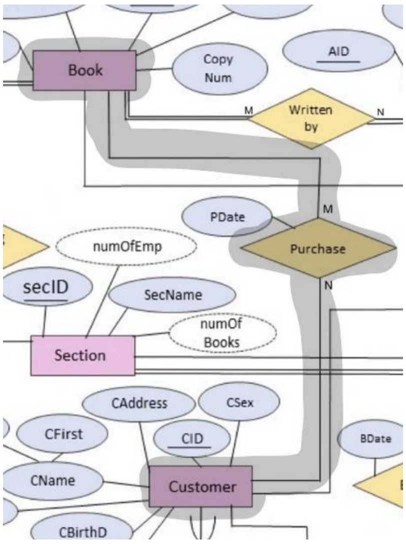
CID	CFirst	CLast	CSex	CAddress	CPhone	CBirthD

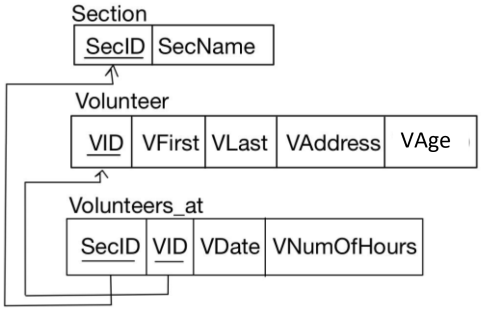
Book

ISBN	BName	PublishingYear	BPrice	CopyNum	SecID

Purchase

ISBN	CID	PDate





Section

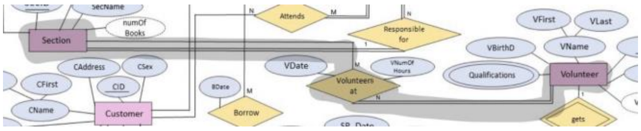
SecID	SecName

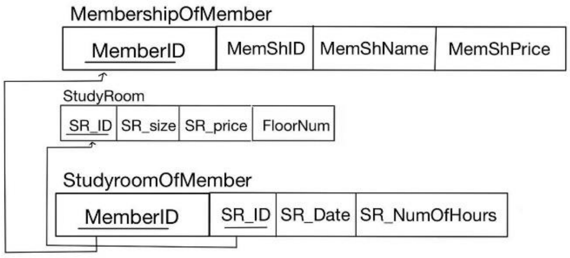
Volunteer

VID	VFirst	VLast	VAddress	VAge

Volunteers_at

SecID	VID	VDate	VNumOfHours





MembershipOfMember

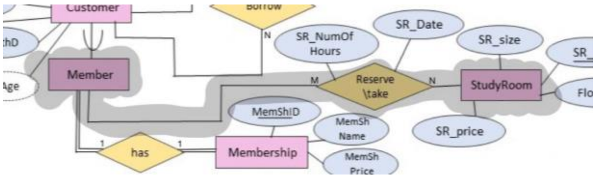
MemberID	MemShID	MemShName	MemShPrice

StudyRoom

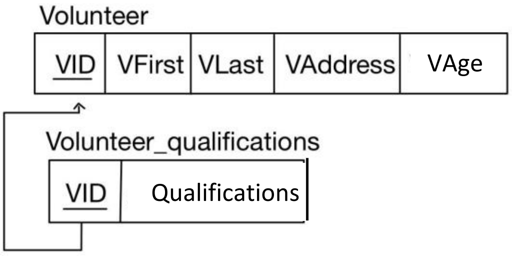
SR_ID	SR_size	SR_price	FloorNum

StudyroomOfMember

MemberID	SR_ID	SR_Date	SR_NumOfHours



3.6 Mapping of multivalued attributes

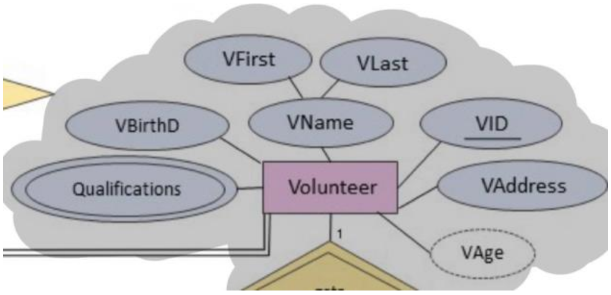


Volunteer

VID	VFirst	VLast	VAddress	VAge

Volunteer_qualifications

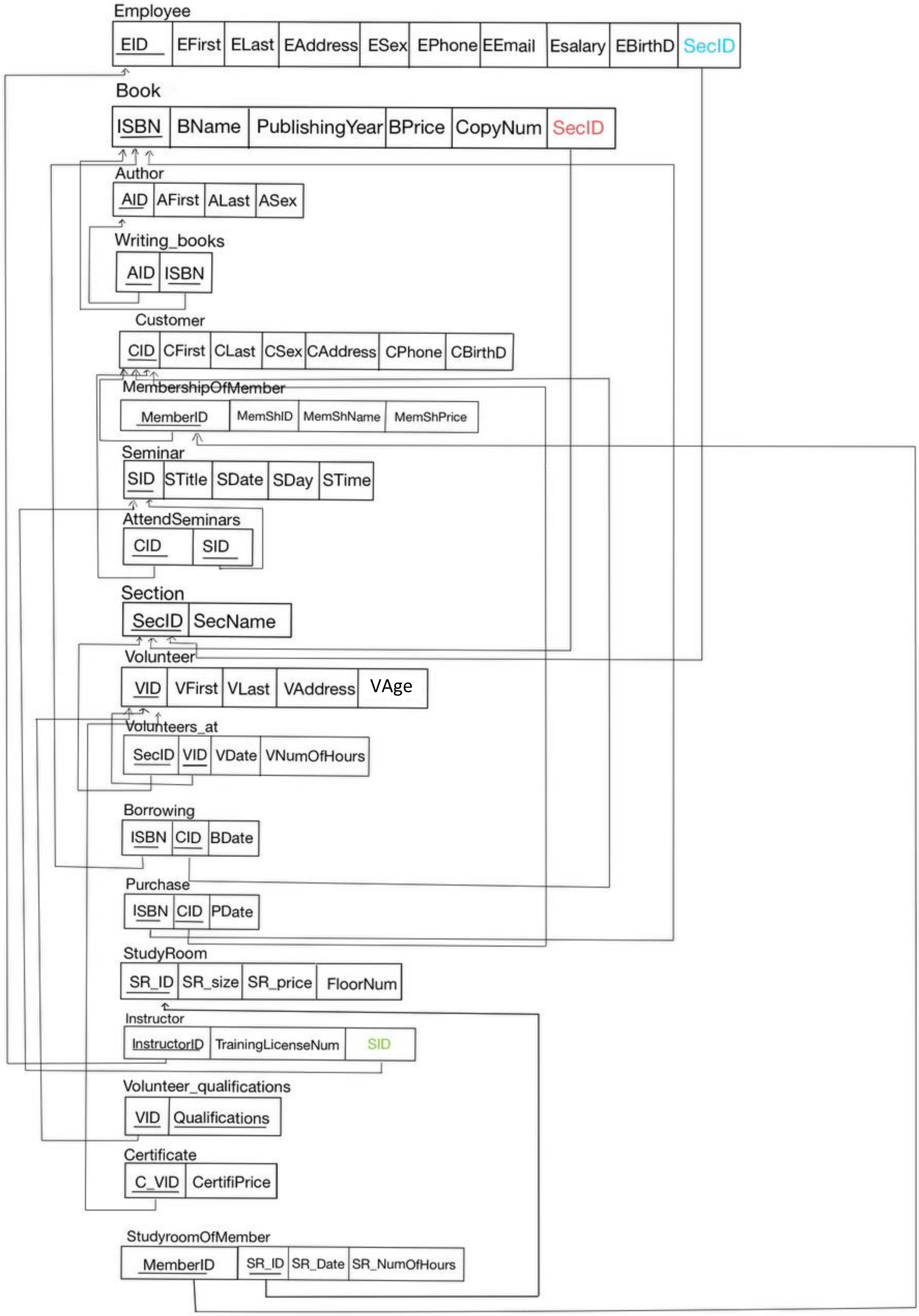
VID	Qualifications



3.7 Mapping of n-any relationship types

NONE.

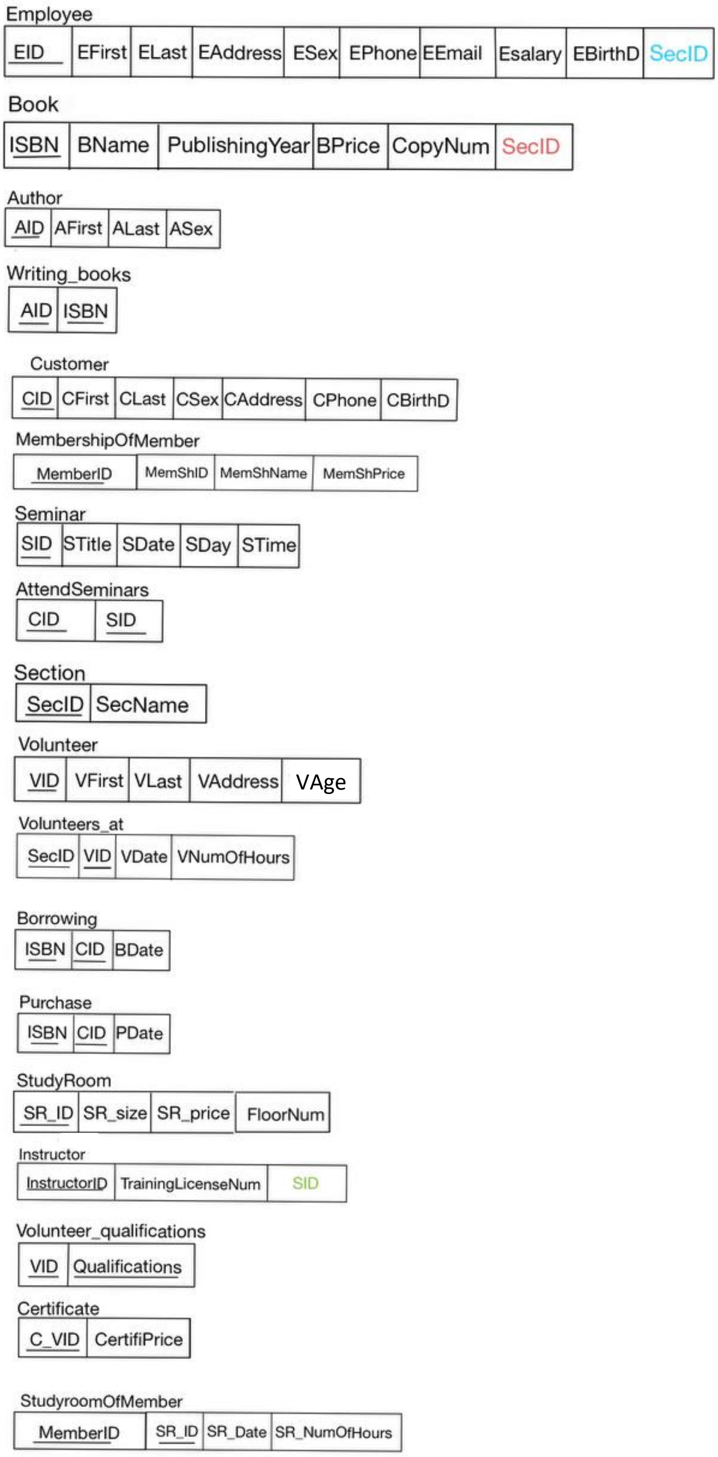
3.8 Schema Diagram


Employee
EID EFirst ELast EAddress ESex EPhone EEmail Esalary EBirthD SecID
Book
ISBN BName PublishingYear BPrice CopyNum SecID
Author
AID AFirst ALast ASex
Writing_books
AID ISBN
Customer
CID CFirst CLast CSex CAddress CPhone CBirthD
MembershipOfMember
MemberID MemShID MemShName MemShPrice
Seminar
SID STitle SDate SDay STime
AttendSeminars
CID SID
Section
SecID SecName
Volunteer
VID VFirst VLast VAddress VAge
Volunteers_at
SecID VID VDate VNumOfHours
Borrowing
ISBN CID BDate
Purchase
ISBN CID PDate
StudyRoom
SR_ID SR_size SR_price FloorNum
Instructor
InstructorID TrainingLicenseNum SID
Volunteer_qualifications
VID Qualifications
Certificate
C_VID CertifiPrice
StudyroomOfMember
MemberID SR_ID SR_Date SR_NumOfHours

4 Normalization

4.1 First Normal Form

There is no multivalued value so all relations are => in the First Normal Form



Employee

EID	EFirst	ELast	EAddress	ESex	EPhone	EEmail	Esalary	EBirthD	SecID

Book

ISBN	BName	PublishingYear	BPrice	CopyNum	SecID

Author

AID	AFirst	ALast	ASex

Writing_books

AID	ISBN

Customer

CID	CFirst	CLast	CSex	CAddress	CPhone	CBirthD

MembershipOfMember

MemberID	MemShID	MemShName	MemShPrice

Seminar

SID	STitle	SDate	SDay	STime

AttendSeminars

CID	SID

Section

SecID	SecName

Volunteer

VID	VFirst	VLast	VAddress	VAge

Volunteers_at

SecID	VID	VDate	VNumOfHours

Borrowing

ISBN	CID	BDate

Purchase

ISBN	CID	PDate

StudyRoom

SR_ID	SR_size	SR_price	FloorNum

Instructor

InstructorID	TrainingLicenseNum	SID

Volunteer_qualifications

VID	Qualifications

Certificate

C_VID	CertifiPrice

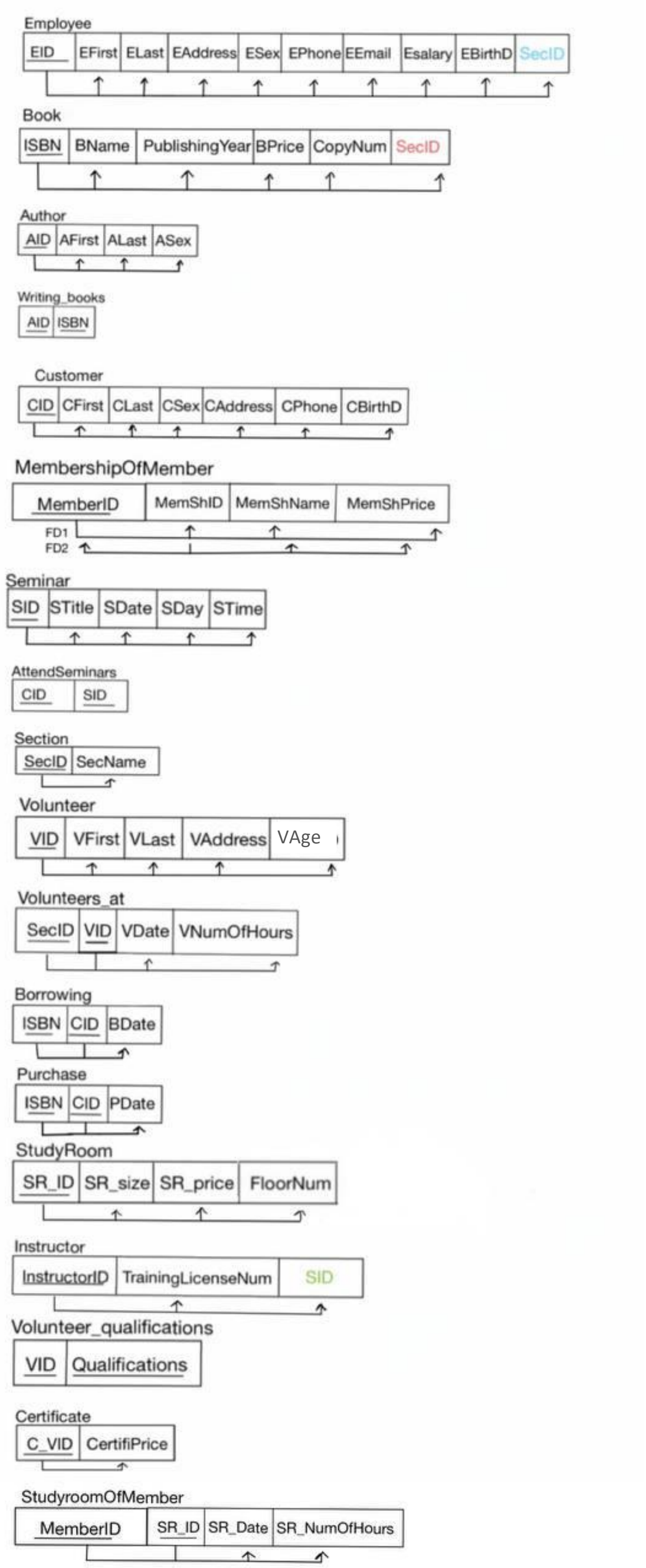
StudyroomOfMember

MemberID	SR_ID	SR_Date	SR_NumOfHours

NOTE: There was a multivalued attribute (Qualifications), but we dealt with it at phase one (in mapping to relational data model)

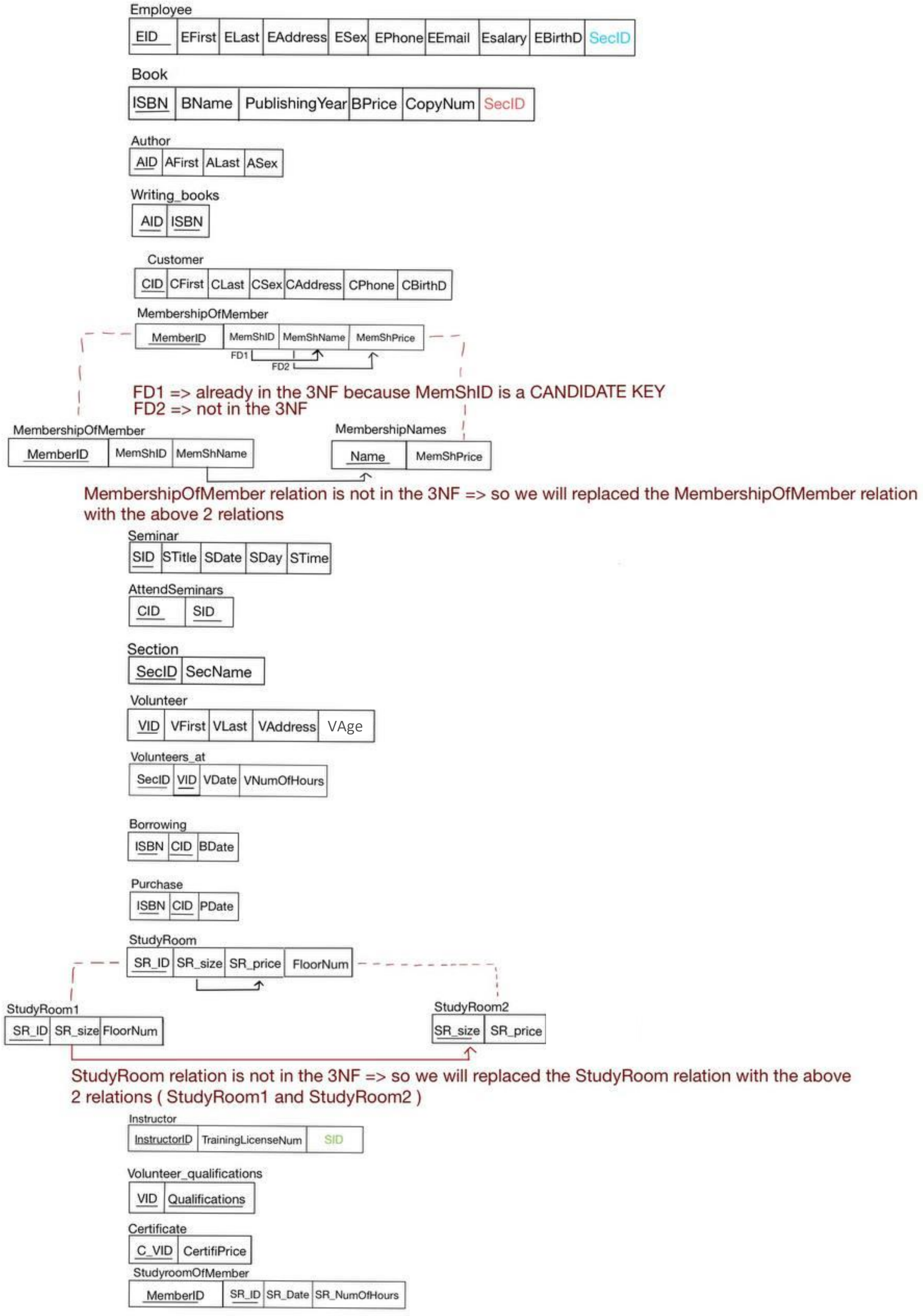
4.2 Second Normal Form

All non-prime attributes in all relations => have fully functionally dependent on the PK (each relation has PK), so all relations are in the => Second Normal Form


Employee
EID | EFirst | ELast | EAddress | ESex | EPhone | EEmail | Esalary | EBirthD | SecID
Book
ISBN | BName | PublishingYear | BPrice | CopyNum | SecID
Author
AID | AFirst | ALast | ASex
Writing_books
AID | ISBN
Customer
CID | CFirst | CLast | CSex | CAddress | CPhone | CBirthD
MembershipOfMember
MemberID | MemShID | MemShName | MemShPrice
FD1
FD2
Seminar
SID | STitle | SDate | SDay | STime
AttendSeminars
CID | SID
Section
SecID | SecName
Volunteer
VID | VFirst | VLast | VAddress | VAge
Volunteers_at
SecID | VID | VDate | VNumOfHours
Borrowing
ISBN | CID | BDate
Purchase
ISBN | CID | PDate
StudyRoom
SR_ID | SR_size | SR_price | FloorNum
Instructor
InstructorID | TrainingLicenseNum | SID
Volunteer_qualifications
VID | Qualifications
Certificate
C_VID | CertifiPrice
StudyroomOfMember
MemberID | SR_ID | SR_Date | SR_NumOfHours

4.3 Third Normal Form

All relations are in the Third Normal Form => If there is no transitive functional dependency (there is no non-prime attribute dependent of non-prime attribute)



Employee

EID	EFirst	ELast	EAddress	ESex	EPhone	EEmail	Esalary	EBirthD	SecID

Book

ISBN	BName	PublishingYear	BPrice	CopyNum	SecID

Author

AID	AFirst	ALast	ASex

Writing_books

AID	ISBN

Customer

CID	CFirst	CLast	CSex	CAddress	CPhone	CBirthD

MembershipOfMember

MemberID	MemShID	MemShName	MemShPrice

FD1 => already in the 3NF because MemShID is a CANDIDATE KEY
FD2 => not in the 3NF

MembershipOfMember

MemberID	MemShID	MemShName

MembershipNames

Name	MemShPrice

MembershipOfMember relation is not in the 3NF => so we will replaced the MembershipOfMember relation with the above 2 relations

Seminar

SID	STitle	SDate	SDay	STime

AttendSeminars

CID	SID

Section

SecID	SecName

Volunteer

VID	VFirst	VLast	VAddress	VAge

Volunteers_at

SecID	VID	VDate	VNumOfHours

Borrowing

ISBN	CID	BDate

Purchase

ISBN	CID	PDate

StudyRoom

SR_ID	SR_size	SR_price	FloorNum

StudyRoom1

SR_ID	SR_size	FloorNum

StudyRoom2

SR_size	SR_price

StudyRoom relation is not in the 3NF => so we will replaced the StudyRoom relation with the above 2 relations (StudyRoom1 and StudyRoom2)

Instructor

InstructorID	TrainingLicenseNum	SID

Volunteer_qualifications

VID	Qualifications

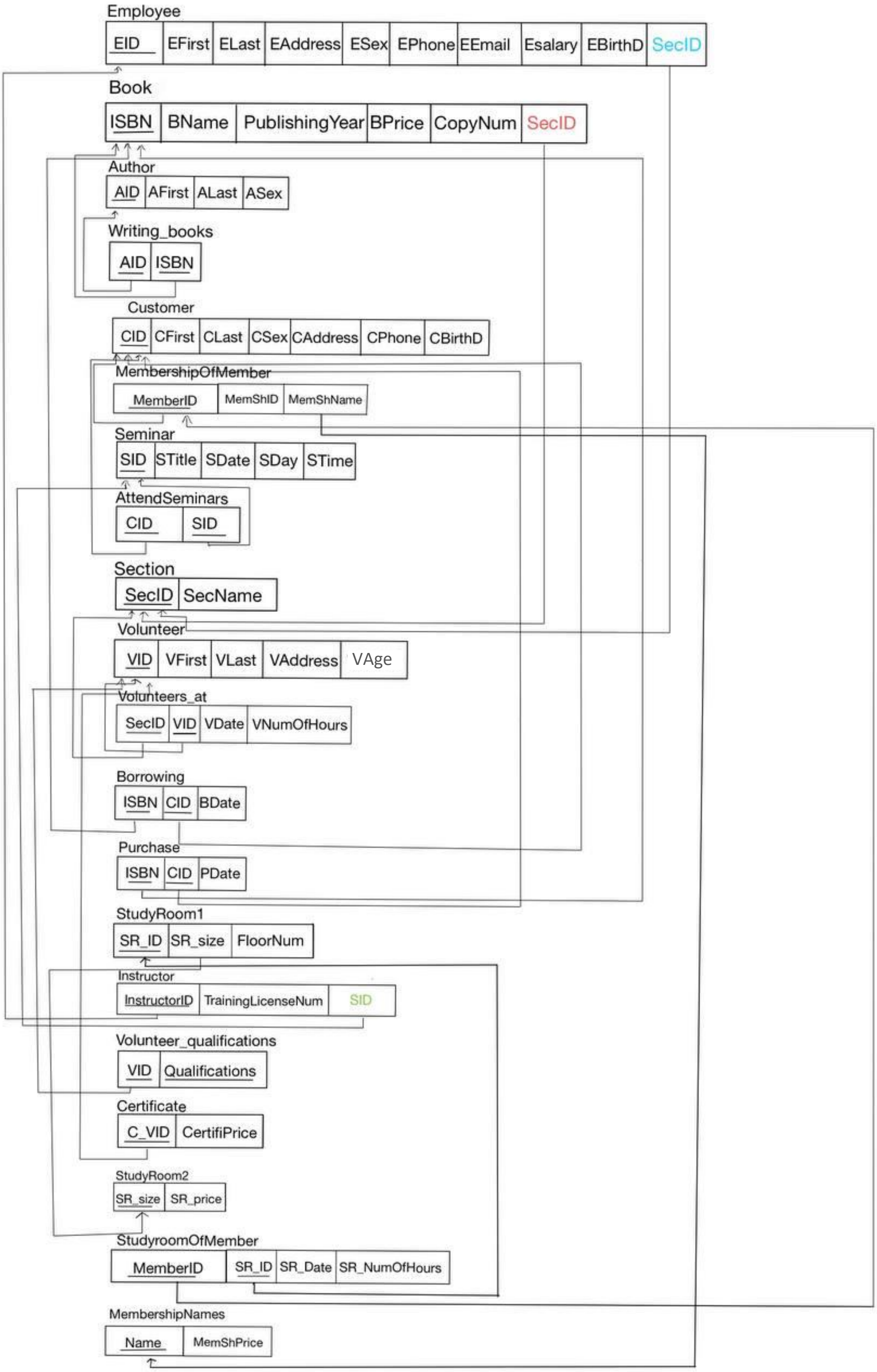
Certificate

C_VID	CertifiPrice

StudyroomOfMember

MemberID	SR_ID	SR_Date	SR_NumOfHours

5 Final DB Schema Diagram

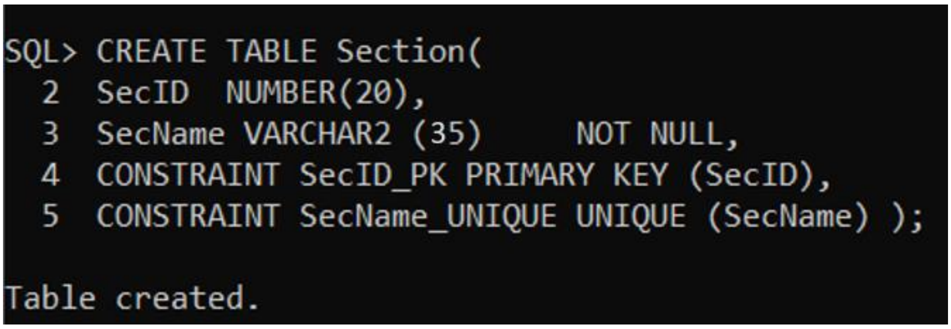

Employee
EID | EFirst | ELast | EAddress | ESex | EPhone | EEmail | Esalary | EBirthD | SecID
Book
ISBN | BName | PublishingYear | BPrice | CopyNum | SecID
Author
AID | AFirst | ALast | ASex
Writing_books
AID | ISBN
Customer
CID | CFirst | CLast | CSex | CAddress | CPhone | CBirthD
MembershipOfMember
MemberID | MemShID | MemShName
Seminar
SID | STitle | SDate | SDay | STime
AttendSeminars
CID | SID
Section
SecID | SecName
Volunteer
VID | VFirst | VLast | VAddress | VAge
Volunteers_at
SecID | VID | VDate | VNumOfHours
Borrowing
ISBN | CID | BDate
Purchase
ISBN | CID | PDate
StudyRoom1
SR_ID | SR_size | FloorNum
Instructor
InstructorID | TrainingLicenseNum | SID
Volunteer_qualifications
VID | Qualifications
Certificate
C_VID | CertifiPrice
StudyRoom2
SR_size | SR_price
StudyroomOfMember
MemberID | SR_ID | SR_Date | SR_NumOfHours
MembershipNames
Name | MemShPrice

PART III: IMPLEMENTATION

6 Table Creation Script

6.1<*Section*> TABLE

```
CREATE TABLE Section(

SecID  NUMBER(20),

SecName VARCHAR2 (35)     NOT NULL,

CONSTRAINT SecID_PK PRIMARY KEY (SecID),

CONSTRAINT SecName_UNIQUE UNIQUE (SecName) );
```

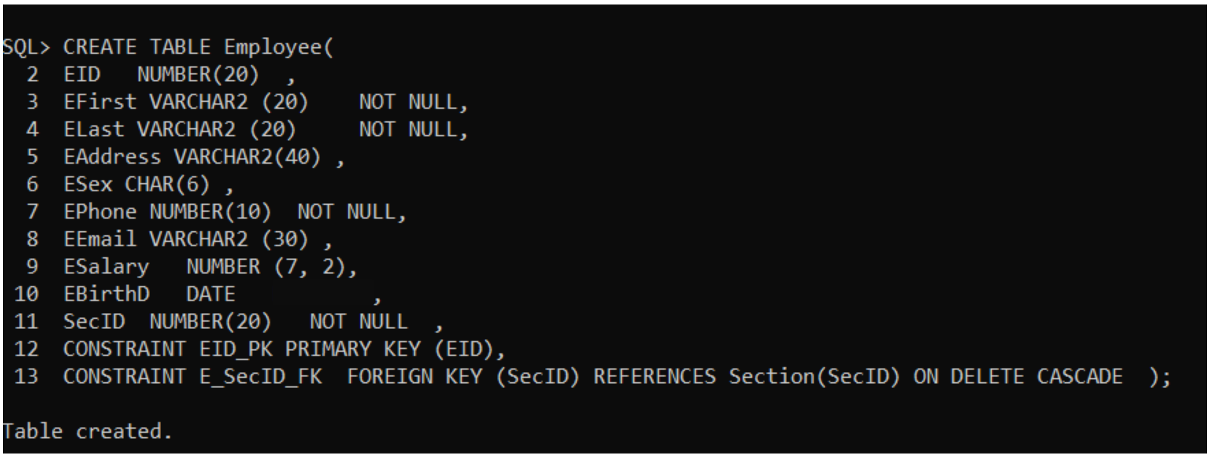


```
SQL> CREATE TABLE Section(
  2  SecID   NUMBER(20),
  3  SecName VARCHAR2 (35)     NOT NULL,
  4  CONSTRAINT SecID_PK PRIMARY KEY (SecID),
  5  CONSTRAINT SecName_UNIQUE UNIQUE (SecName) );

Table created.
```

6.2<Employee> TABLE

```
CREATE TABLE Employee(

EID   NUMBER(20)  ,

EFirst VARCHAR2 (20)    NOT NULL,

ELast VARCHAR2 (20)     NOT NULL,

EAddress VARCHAR2(40) ,

ESex CHAR(6) ,

EPhone NUMBER(10)  NOT NULL,

EEmail VARCHAR2 (30) ,

ESalary   NUMBER (7, 2),

EBirthD   DATE   NOT NULL,

SecID  NUMBER(20)   NOT NULL  ,

CONSTRAINT EID_PK PRIMARY KEY (EID),
```

CONSTRAINT E_SecID_FK FOREIGN KEY (SecID) REFERENCES Section(SecID) ON DELETE CASCADE);



```
SQL> CREATE TABLE Employee(
  2  EID   NUMBER(20)  ,
  3  EFirst VARCHAR2 (20)    NOT NULL,
  4  ELast VARCHAR2 (20)     NOT NULL,
  5  EAddress VARCHAR2(40) ,
  6  ESex CHAR(6) ,
  7  EPhone NUMBER(10)  NOT NULL,
  8  EEmail VARCHAR2 (30) ,
  9  ESalary   NUMBER (7, 2),
 10  EBirthD   DATE           ,
 11  SecID  NUMBER(20)   NOT NULL  ,
 12  CONSTRAINT EID_PK PRIMARY KEY (EID),
 13  CONSTRAINT E_SecID_FK  FOREIGN KEY (SecID) REFERENCES Section(SecID) ON DELETE CASCADE  );

Table created.
```

6.3<*Book*> TABLE

CREATE TABLE Book(

ISBN VARCHAR2 (13)   ,

BName VARCHAR2 (40)   NOT NULL,

PublishingYear   NUMBER(4) NOT NULL,

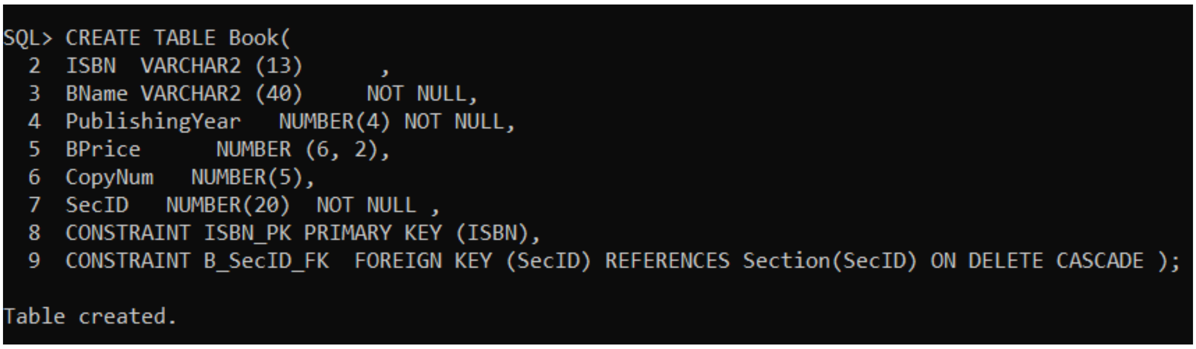
BPrice   NUMBER (6, 2),

CopyNum   NUMBER(5),

SecID   NUMBER(20) NOT NULL ,

CONSTRAINT ISBN_PK PRIMARY KEY (ISBN),

CONSTRAINT B_SecID_FK FOREIGN KEY (SecID) REFERENCES Section(SecID) ON DELETE CASCADE);



```
SQL> CREATE TABLE Book(
  2  ISBN  VARCHAR2 (13)      ,
  3  BName VARCHAR2 (40)     NOT NULL,
  4  PublishingYear   NUMBER(4) NOT NULL,
  5  BPrice      NUMBER (6, 2),
  6  CopyNum   NUMBER(5),
  7  SecID   NUMBER(20)  NOT NULL ,
  8  CONSTRAINT ISBN_PK PRIMARY KEY (ISBN),
  9  CONSTRAINT B_SecID_FK  FOREIGN KEY (SecID) REFERENCES Section(SecID) ON DELETE CASCADE );

Table created.
```

6.4<*Author*> TABLE

CREATE TABLE Author(

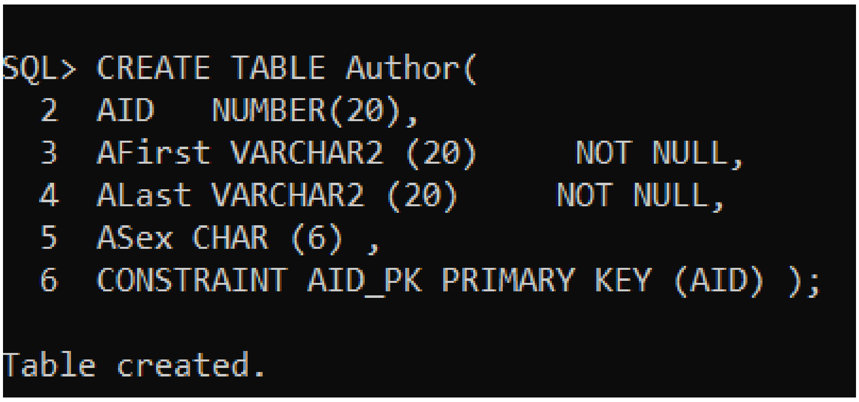
AID   NUMBER(20),

AFirst VARCHAR2 (20)   NOT NULL,

ALast VARCHAR2 (20)   NOT NULL,

ASex CHAR (6) ,

CONSTRAINT AID_PK PRIMARY KEY (AID));



```
SQL> CREATE TABLE Author(
  2  AID   NUMBER(20),
  3  AFirst VARCHAR2 (20)     NOT NULL,
  4  ALast VARCHAR2 (20)     NOT NULL,
  5  ASex CHAR (6) ,
  6  CONSTRAINT AID_PK PRIMARY KEY (AID) );

Table created.
```

6.5<*Writing_books*> TABLE

CREATE TABLE Writing_books(

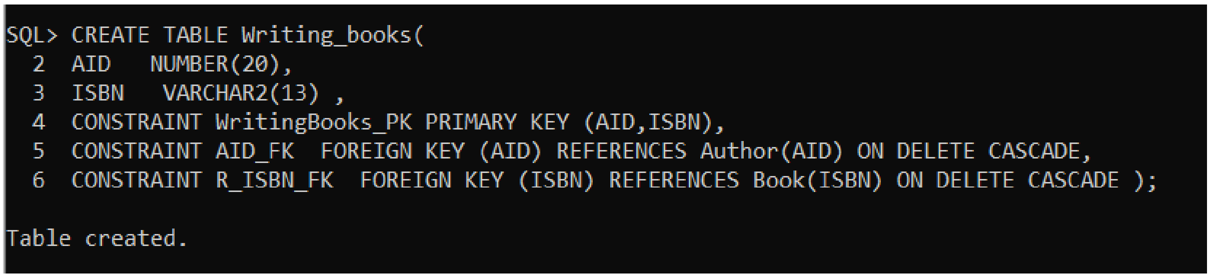
AID   NUMBER(20),

ISBN   VARCHAR2(13) ,

CONSTRAINT WritingBooks_PK PRIMARY KEY (AID,ISBN),

CONSTRAINT AID_FK FOREIGN KEY (AID) REFERENCES Author(AID) ON DELETE CASCADE,

CONSTRAINT R_ISBN_FK FOREIGN KEY (ISBN) REFERENCES Book(ISBN) ON DELETE CASCADE);



```
SQL> CREATE TABLE Writing_books(
  2  AID   NUMBER(20),
  3  ISBN   VARCHAR2(13) ,
  4  CONSTRAINT WritingBooks_PK PRIMARY KEY (AID,ISBN),
  5  CONSTRAINT AID_FK  FOREIGN KEY (AID) REFERENCES Author(AID) ON DELETE CASCADE,
  6  CONSTRAINT R_ISBN_FK  FOREIGN KEY (ISBN) REFERENCES Book(ISBN) ON DELETE CASCADE );

Table created.
```

6.6<Customer> TABLE

CREATE TABLE Customer(

CID   NUMBER(20),

CFirst VARCHAR2 (20)   NOT NULL,

CLast VARCHAR2 (20)   NOT NULL,

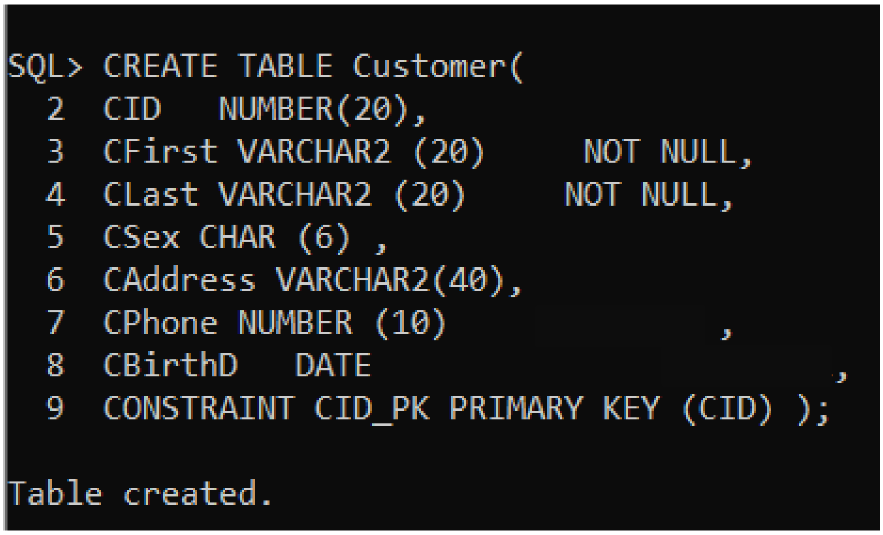
CSex CHAR (6) ,

CAddress VARCHAR2(40),

CPhone NUMBER (10)   NOT NULL ,

CBirthD   DATE   NOT NULL,

CONSTRAINT CID_PK PRIMARY KEY (CID));



```
SQL> CREATE TABLE Customer(
     CID    NUMBER(20),
     CFirst VARCHAR2 (20)     NOT NULL,
     CLast VARCHAR2 (20)     NOT NULL,
     CSex CHAR (6) ,
     CAddress VARCHAR2(40),
     CPhone NUMBER (10)                ,
     CBirthD    DATE                         ,
     CONSTRAINT CID_PK PRIMARY KEY (CID) );

Table created.
```

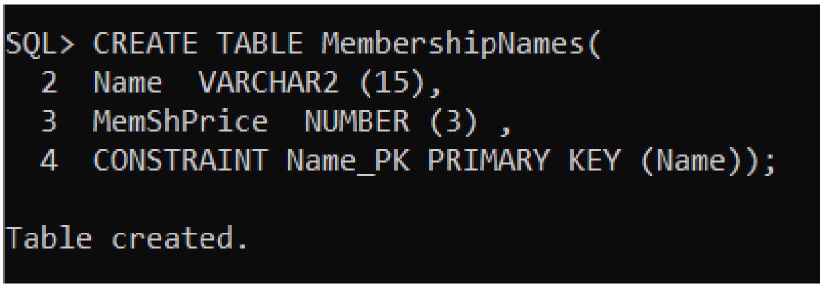
6.7*<MembershipNames>* TABLE

CREATE TABLE MembershipNames(

Name VARCHAR2 (15),

MemShPrice NUMBER (3) ,

CONSTRAINT Name_PK PRIMARY KEY (Name));



```
SQL> CREATE TABLE MembershipNames(
     Name   VARCHAR2 (15),
     MemShPrice   NUMBER (3) ,
     CONSTRAINT Name_PK PRIMARY KEY (Name));

Table created.
```

6.8*<Seminar>* TABLE

CREATE TABLE Seminar(

SID   NUMBER(4),

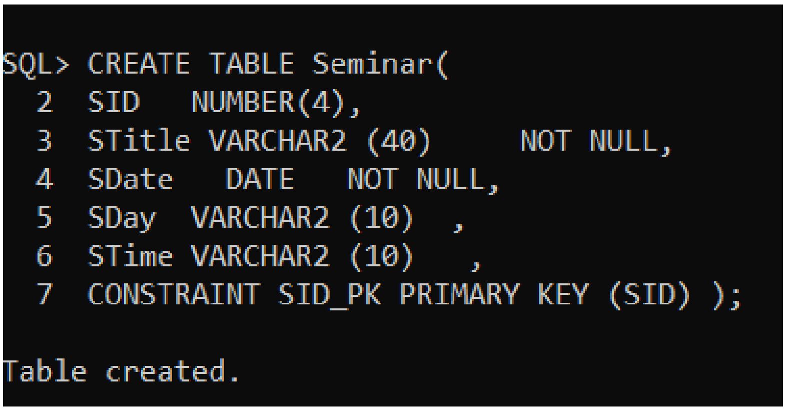
STitle VARCHAR2 (40)   NOT NULL,

SDate   DATE   NOT NULL,

SDay VARCHAR2 (10) ,

STime VARCHAR2 (10)   ,

CONSTRAINT SID_PK PRIMARY KEY (SID));



```
SQL> CREATE TABLE Seminar(
     SID    NUMBER(4),
     STitle VARCHAR2 (40)     NOT NULL,
     SDate    DATE    NOT NULL,
     SDay   VARCHAR2 (10)   ,
     STime VARCHAR2 (10)    ,
     CONSTRAINT SID_PK PRIMARY KEY (SID) );

Table created.
```

6.9*<MembershipOfMember>* TABLE

CREATE TABLE MembershipOfMember(

MemberID   NUMBER(20) ,

MemShID   NUMBER(7)   NOT NULL,

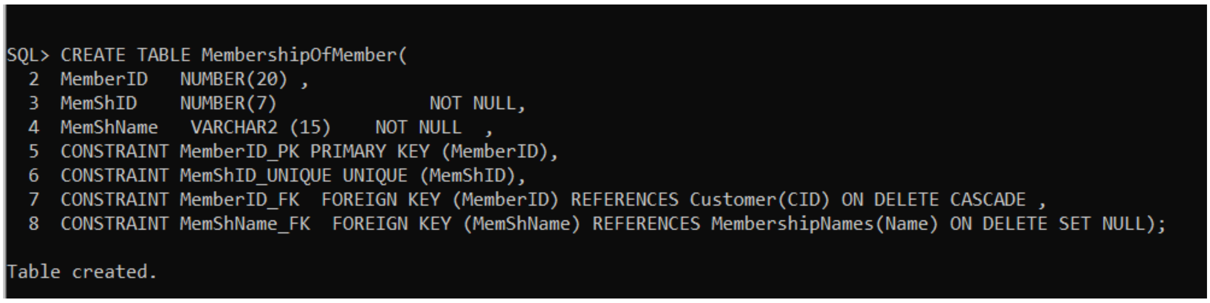
MemShName   VARCHAR2 (15)   NOT NULL ,

CONSTRAINT MemberID_PK PRIMARY KEY (MemberID),

CONSTRAINT MemShID_UNIQUE UNIQUE (MemShID),

CONSTRAINT MemberID_FK FOREIGN KEY (MemberID) REFERENCES Customer(CID) ON DELETE CASCADE ,

CONSTRAINT MemShName_FK FOREIGN KEY (MemShName) REFERENCES MembershipNames(Name) ON DELETE SET NULL);



```
SQL> CREATE TABLE MembershipOfMember(
     MemberID    NUMBER(20) ,
     MemShID     NUMBER(7)              NOT NULL,
     MemShName    VARCHAR2 (15)    NOT NULL   ,
     CONSTRAINT MemberID_PK PRIMARY KEY (MemberID),
     CONSTRAINT MemShID_UNIQUE UNIQUE (MemShID),
     CONSTRAINT MemberID_FK  FOREIGN KEY (MemberID) REFERENCES Customer(CID) ON DELETE CASCADE ,
     CONSTRAINT MemShName_FK  FOREIGN KEY (MemShName) REFERENCES MembershipNames(Name) ON DELETE SET NULL);

Table created.
```

6.10*<Instructor>* TABLE

CREATE TABLE Instructor(

InstructorID   NUMBER(20)   ,

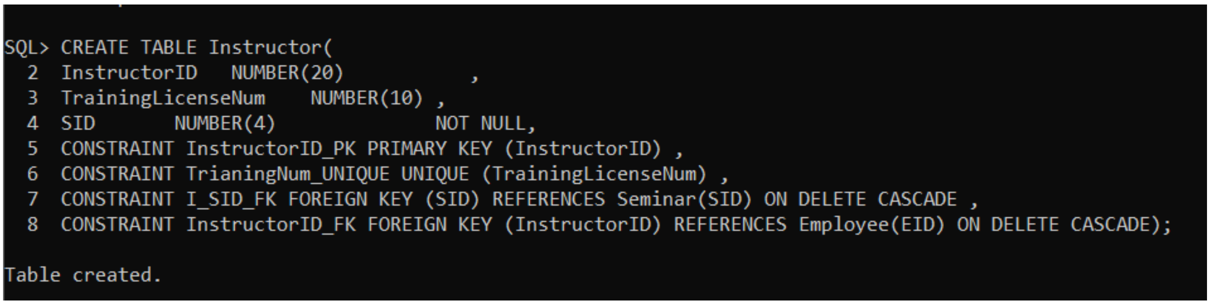
TrainingLicenseNum   NUMBER(10) ,

SID   NUMBER(4)   NOT NULL,

CONSTRAINT InstructorID_PK PRIMARY KEY (InstructorID) ,

CONSTRAINT TrianingNum_UNIQUE UNIQUE (TrainingLicenseNum) ,

CONSTRAINT I_SID_FK FOREIGN KEY (SID) REFERENCES Seminar(SID) ON DELETE CASCADE , CONSTRAINT InstructorID_FK FOREIGN KEY (InstructorID) REFERENCES Employee(EID) ON DELETE CASCADE);



```
SQL> CREATE TABLE Instructor(
InstructorID   NUMBER(20)             ,
TrainingLicenseNum    NUMBER(10) ,
SID        NUMBER(4)              NOT NULL,
CONSTRAINT InstructorID_PK PRIMARY KEY (InstructorID) ,
CONSTRAINT TrianingNum_UNIQUE UNIQUE (TrainingLicenseNum) ,
CONSTRAINT I_SID_FK FOREIGN KEY (SID) REFERENCES Seminar(SID) ON DELETE CASCADE ,
CONSTRAINT InstructorID_FK FOREIGN KEY (InstructorID) REFERENCES Employee(EID) ON DELETE CASCADE);

Table created.
```

6.11<*Volunteer*> TABLE

DONE

CREATE TABLE Volunteer(

VID   NUMBER(20)   ,

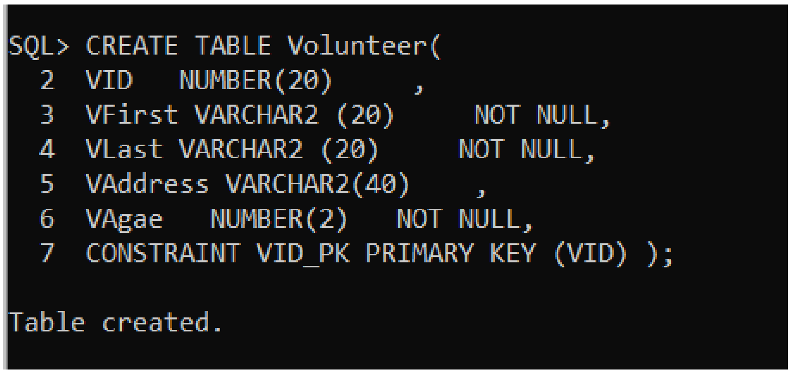
VFirst VARCHAR2 (20)   NOT NULL,

VLast VARCHAR2 (20)   NOT NULL,

VAddress VARCHAR2(40)   ,

VAgae   NUMBER(2)   NOT NULL,

CONSTRAINT VID_PK PRIMARY KEY (VID));



```
SQL> CREATE TABLE Volunteer(
VID    NUMBER(20)      ,
VFirst VARCHAR2 (20)     NOT NULL,
VLast VARCHAR2 (20)     NOT NULL,
VAddress VARCHAR2(40)     ,
VAgae    NUMBER(2)    NOT NULL,
CONSTRAINT VID_PK PRIMARY KEY (VID) );

Table created.
```

6.12<*Volunteer_at*> TABLE

CREATE TABLE Volunteers_at(

SecID   NUMBER(20)   ,

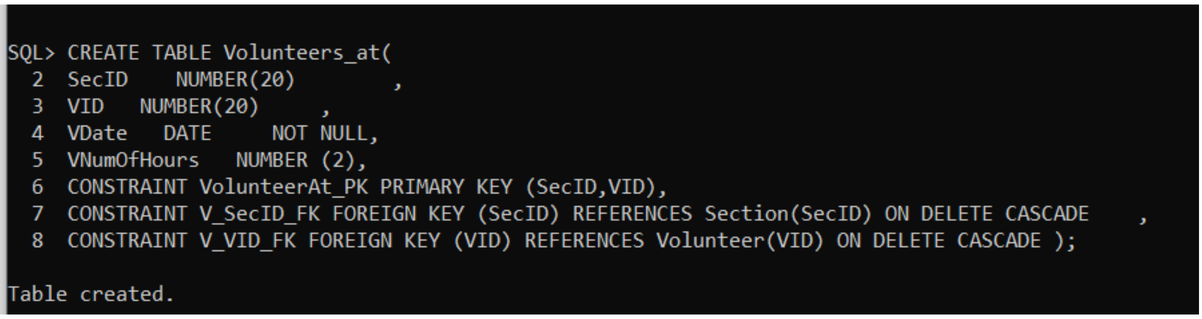
VID   NUMBER(20)   ,

VDate   DATE   NOT NULL,

VNumOfHours   NUMBER (2),

CONSTRAINT VolunteerAt_PK PRIMARY KEY (SecID,VID),

CONSTRAINT V_SecID_FK FOREIGN KEY (SecID) REFERENCES Section(SecID) ON DELETE CASCADE   , CONSTRAINT V_VID_FK FOREIGN KEY (VID) REFERENCES Volunteer(VID) ON DELETE CASCADE);



```
SQL> CREATE TABLE Volunteers_at(
  2  SecID     NUMBER(20)         ,
  3  VID   NUMBER(20)      ,
  4  VDate    DATE      NOT NULL,
  5  VNumOfHours    NUMBER (2),
  6  CONSTRAINT VolunteerAt_PK PRIMARY KEY (SecID,VID),
  7  CONSTRAINT V_SecID_FK FOREIGN KEY (SecID) REFERENCES Section(SecID) ON DELETE CASCADE    ,
  8  CONSTRAINT V_VID_FK FOREIGN KEY (VID) REFERENCES Volunteer(VID) ON DELETE CASCADE );

Table created.
```

6.13<*Volunteer_qualifications*> TABLE

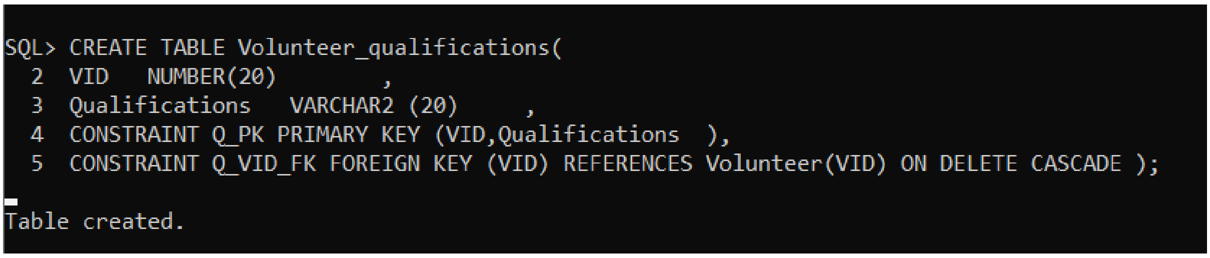
CREATE TABLE Volunteer_qualifications(

VID   NUMBER(20)   ,

Qualifications   VARCHAR2 (20)   ,

CONSTRAINT Q_PK PRIMARY KEY (VID,Qualifications),

CONSTRAINT Q_VID_FK FOREIGN KEY (VID) REFERENCES Volunteer(VID) ON DELETE CASCADE);



```
SQL> CREATE TABLE Volunteer_qualifications(
  2  VID   NUMBER(20)         ,
  3  Qualifications   VARCHAR2 (20)     ,
  4  CONSTRAINT Q_PK PRIMARY KEY (VID,Qualifications  ),
  5  CONSTRAINT Q_VID_FK FOREIGN KEY (VID) REFERENCES Volunteer(VID) ON DELETE CASCADE );

Table created.
```

6.14<*Certificate*> TABLE

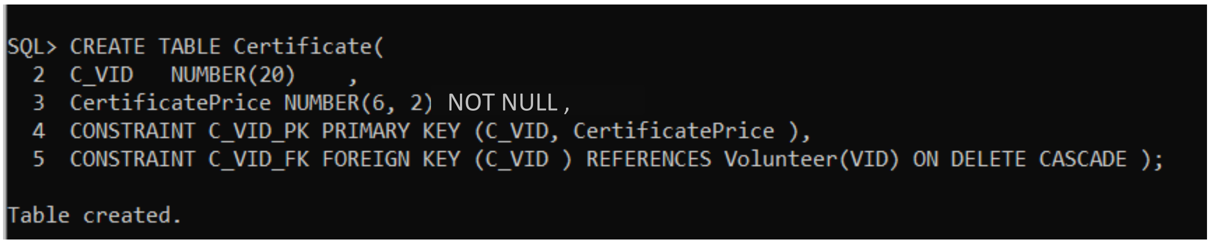
CREATE TABLE Certificate(

C_VID   NUMBER(20)   ,

CertificatePrice NUMBER(6, 2),

CONSTRAINT C_VID_PK PRIMARY KEY (C_VID, CertificatePrice),

CONSTRAINT C_VID_FK FOREIGN KEY (C_VID) REFERENCES Volunteer(VID) ON DELETE CASCADE);



```
SQL> CREATE TABLE Certificate(
  2  C_VID   NUMBER(20)    ,
  3  CertificatePrice NUMBER(6, 2) NOT NULL ,
  4  CONSTRAINT C_VID_PK PRIMARY KEY (C_VID, CertificatePrice ),
  5  CONSTRAINT C_VID_FK FOREIGN KEY (C_VID ) REFERENCES Volunteer(VID) ON DELETE CASCADE );

Table created.
```

6.15<*Borrowing*> TABLE

CREATE TABLE Borrowing(

ISBN   VARCHAR2(13)   ,

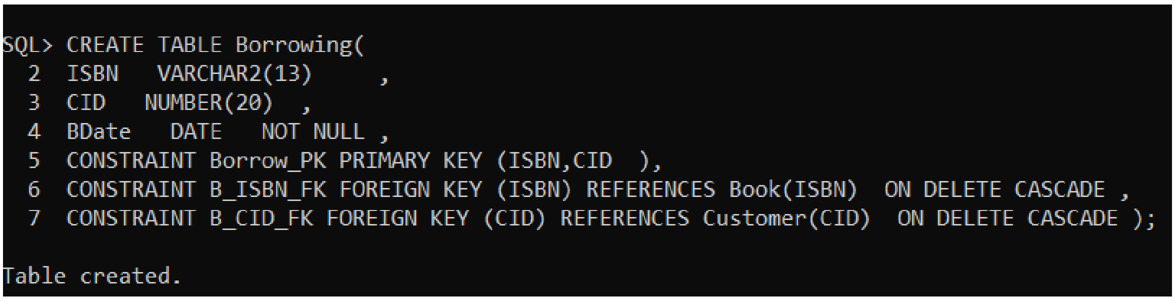
CID   NUMBER(20) ,

BDate   DATE   NOT NULL ,

CONSTRAINT Borrow_PK PRIMARY KEY (ISBN,CID),

CONSTRAINT B_ISBN_FK FOREIGN KEY (ISBN) REFERENCES Book(ISBN) ON DELETE CASCADE ,

CONSTRAINT B_CID_FK FOREIGN KEY (CID) REFERENCES Customer(CID) ON DELETE CASCADE);



```
SQL> CREATE TABLE Borrowing(
  2  ISBN   VARCHAR2(13)     ,
  3  CID   NUMBER(20)  ,
  4  BDate   DATE   NOT NULL ,
  5  CONSTRAINT Borrow_PK PRIMARY KEY (ISBN,CID  ),
  6  CONSTRAINT B_ISBN_FK FOREIGN KEY (ISBN) REFERENCES Book(ISBN)  ON DELETE CASCADE ,
  7  CONSTRAINT B_CID_FK FOREIGN KEY (CID) REFERENCES Customer(CID)  ON DELETE CASCADE );

Table created.
```

6.16<*Purchase*> TABLE

CREATE TABLE Purchase(

ISBN   VARCHAR2(13)   ,

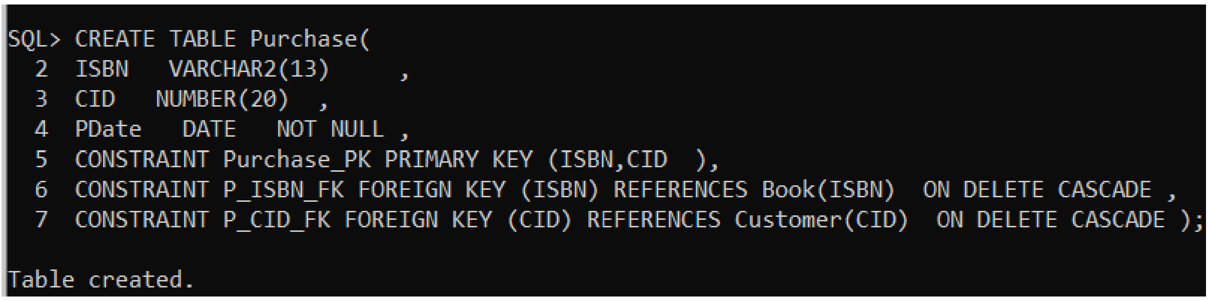
CID   NUMBER(20) ,

PDate   DATE   NOT NULL ,

CONSTRAINT Purchase_PK PRIMARY KEY (ISBN,CID),

CONSTRAINT P_ISBN_FK FOREIGN KEY (ISBN) REFERENCES Book(ISBN) ON DELETE CASCADE ,

CONSTRAINT P_CID_FK FOREIGN KEY (CID) REFERENCES Customer(CID) ON DELETE CASCADE);



```
SQL> CREATE TABLE Purchase(
  2  ISBN   VARCHAR2(13)     ,
  3  CID   NUMBER(20)  ,
  4  PDate   DATE   NOT NULL ,
  5  CONSTRAINT Purchase_PK PRIMARY KEY (ISBN,CID  ),
  6  CONSTRAINT P_ISBN_FK FOREIGN KEY (ISBN) REFERENCES Book(ISBN)  ON DELETE CASCADE ,
  7  CONSTRAINT P_CID_FK FOREIGN KEY (CID) REFERENCES Customer(CID)  ON DELETE CASCADE );

Table created.
```

6.17<*AttendSeminars*> TABLE

CREATE TABLE AttendSeminars(

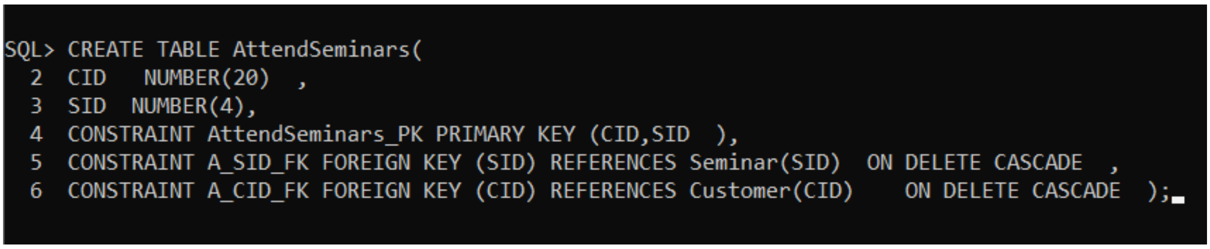
CID   NUMBER(20) ,

SID NUMBER(4),

CONSTRAINT AttendSeminars_PK PRIMARY KEY (CID,SID),

CONSTRAINT A_SID_FK FOREIGN KEY (SID) REFERENCES Seminar(SID) ON DELETE CASCADE ,

CONSTRAINT A_CID_FK FOREIGN KEY (CID) REFERENCES Customer(CID)   ON DELETE CASCADE);



```
SQL> CREATE TABLE AttendSeminars(
 CID    NUMBER(20)   ,
 SID   NUMBER(4),
 CONSTRAINT AttendSeminars_PK PRIMARY KEY (CID,SID  ),
 CONSTRAINT A_SID_FK FOREIGN KEY (SID) REFERENCES Seminar(SID)  ON DELETE CASCADE   ,
 CONSTRAINT A_CID_FK FOREIGN KEY (CID) REFERENCES Customer(CID)    ON DELETE CASCADE   );
```

6.18<*StudyRoom2*> TABLE

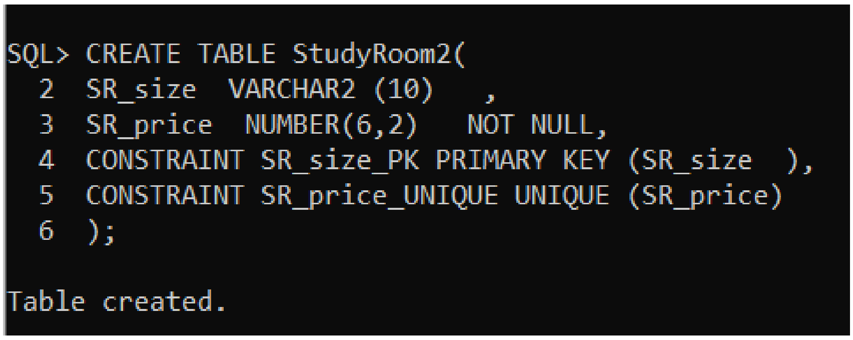
CREATE TABLE StudyRoom2(

SR_size VARCHAR2 (10)   ,

SR_price NUMBER(6,2)   NOT NULL,

CONSTRAINT SR_size_PK PRIMARY KEY (SR_size),

CONSTRAINT SR_price_UNIQUE UNIQUE (SR_price));



```
SQL> CREATE TABLE StudyRoom2(
 SR_size  VARCHAR2 (10)   ,
 SR_price  NUMBER(6,2)   NOT NULL,
 CONSTRAINT SR_size_PK PRIMARY KEY (SR_size  ),
 CONSTRAINT SR_price_UNIQUE UNIQUE (SR_price)
 );

Table created.
```

6.19<*StudyRoom1*> TABLE

CREATE TABLE StudyRoom1(

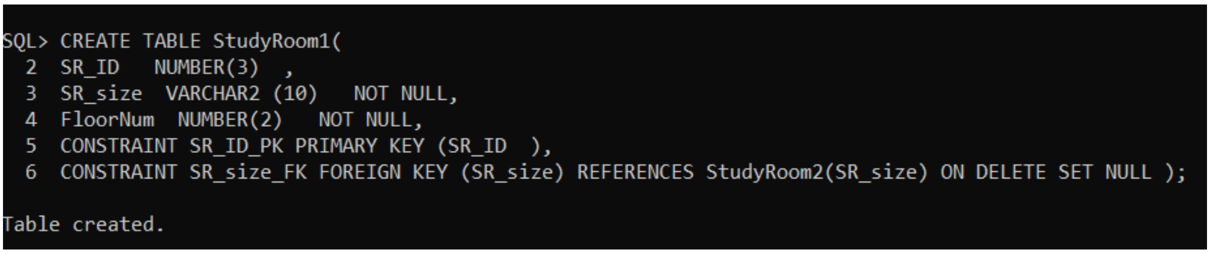
SR_ID   NUMBER(3) ,

SR_size VARCHAR2 (10)   NOT NULL,

FloorNum NUMBER(2)   NOT NULL,

CONSTRAINT SR_ID_PK PRIMARY KEY (SR_ID),

CONSTRAINT SR_size_FK FOREIGN KEY (SR_size) REFERENCES StudyRoom2(SR_size) ON DELETE SET NULL);



```
SQL> CREATE TABLE StudyRoom1(
 SR_ID   NUMBER(3)  ,
 SR_size  VARCHAR2 (10)   NOT NULL,
 FloorNum  NUMBER(2)   NOT NULL,
 CONSTRAINT SR_ID_PK PRIMARY KEY (SR_ID  ),
 CONSTRAINT SR_size_FK FOREIGN KEY (SR_size) REFERENCES StudyRoom2(SR_size) ON DELETE SET NULL );

Table created.
```

6.20 *<StudyRoomOfMember>* TABLE

CREATE TABLE StudyRoomOfMember(

MemberID   NUMBER(20) ,

SR_ID   NUMBER(3) ,

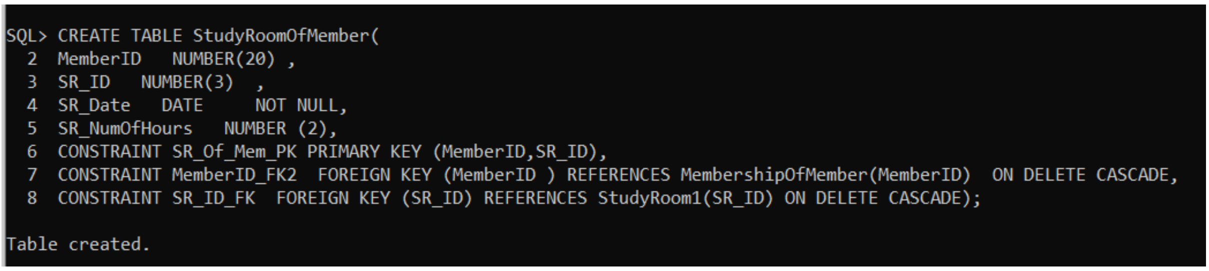
SR_Date   DATE   NOT NULL,

SR_NumOfHours   NUMBER (2),

CONSTRAINT SR_Of_Mem_PK PRIMARY KEY (MemberID,SR_ID),

CONSTRAINT MemberID_FK2 FOREIGN KEY (MemberID) REFERENCES MembershipOfMember(MemberID) ON DELETE CASCADE,

CONSTRAINT SR_ID_FK FOREIGN KEY (SR_ID) REFERENCES StudyRoom1(SR_ID) ON DELETE CASCADE);



```
SQL> CREATE TABLE StudyRoomOfMember(
  2  MemberID    NUMBER(20) ,
  3  SR_ID    NUMBER(3)   ,
  4  SR_Date    DATE      NOT NULL,
  5  SR_NumOfHours    NUMBER (2),
  6  CONSTRAINT SR_Of_Mem_PK PRIMARY KEY (MemberID,SR_ID),
  7  CONSTRAINT MemberID_FK2  FOREIGN KEY (MemberID ) REFERENCES MembershipOfMember(MemberID)  ON DELETE CASCADE,
  8  CONSTRAINT SR_ID_FK  FOREIGN KEY (SR_ID) REFERENCES StudyRoom1(SR_ID) ON DELETE CASCADE);

Table created.
```

7 Constraints Script

Business Rule	Design Decisions	Justification (if any)
Each book has a unique ID	CREAT TABLE Book(ISBN VARCHAR2(13), … CONSTRAINT ISBN_PK PRIMARY KEY(ISBN),..;	Book
Each book must be available in the system	CREAT TABLE Book(… BName VARCHAR2(40) NOT NULL, …;	Book
Each book belongs to one section	CREAT TABLE Book(… SecID NUMBER(20) NUT NULL, …;	Book
Each book will have a published year	CREAT TABLE Book(… PublishingYear NUMBER(4) NUT NULL, …;	Book
Every author must have a unique ID	CREAT TABLE Author(AID NUMBER(20), …	Author

	CONSTRAINT AID_PK PRIMARY KEY(AID),...;	
Every author must have first and last name	CREAT TABLE Author (AFirst VARCHAR2(20) NOT NULL, ALast VARCHAR2(2) NOT NULL ,...;	Author
Each employee must have a unique ID	CREAT TABLE Employee (EID NUMBER(20), … CONSTRAINT EID_PK PRIMARY KEY(EID),...;	Employee
Each employee must be responsible for one section	CREAT TABLE Employee (… SecID NUMBER(20) NOT NULL,..;	Employee
Each employee must have first and last name and phone number	CREAT TABLE Employee (AFirst VARCHAR2(20) NOT NULL, ALast VARCHAR2(2) NOT NULL , … EPhone NUMBER(10) NOT NULL...;	Employee
Every instructor must be an employee	CREAT TABLE Instructor (InstructorID NUMBER(20), … CONSTRAINT InstructorID _FK FORIGN KEY(ISBN) REFRENCES Employee(EID) ON DELETE CASCADE);	Instructor
Every instructor will have a training license	CREAT TABLE Instructor (… TrainingLicenseNum NUMBER(20), … CONSTRAINT TrianingNum _UNIQUE UNIQUE(TrainingLicenseNum), …;	Instructor
Every instructor must present only one seminar	CREATE TABLE Instructor(… SID NUMBER(4) NOT NULL, … CONSTRAINT I_SID_FK FOREIGN KEY (SID) REFERENCES Seminar(SID) ON DELETE CASCADE , …);	Instructor

Each instructor has a unique ID	CREATE TABLE Instructor(
	InstructorID NUMBER(20) ,
	CONSTRAINT InstructorID_PK PRIMARY KEY (InstructorID) , …);
		Instructor

Each customer must have a unique ID	CREAT TABLE Customer (CID NUMBER(20), … CONSTRAINT CID_PK PRIMARY KEY(CID),...);	Customer

Customers must have first and last name	CREATE TABLE Customer(
	CID NUMBER(20),
	CFirst VARCHAR2 (20) NOT NULL,
	CLast VARCHAR2 (20) NOT NULL, …);
		Customer

Every member will have a unique member	CREAT TABLE MembershioOfMember(MemberID NUMBER(20), … CONSTRAINT MemberID_FK FOREIGN KEY(MemberID) REFRENCES Customer(CID) ON DELETE CASCADE,...);	MembershioOfMember
Every member has only one membership	CREAT TABLE MembershioOfMember(… MemShID NUMBER(20), … CONSTRAINT MemShID _UNIQUE UNIQUE(MemShID),...);	MembershioOfMember

Each membership has a name and a certain price	CREATE TABLE MembershipOfMember(
	MemShName VARCHAR2 (15) NOT NULL , … CONSTRAINT MemShName_FK FOREIGN KEY (MemShName) REFERENCES MembershipNames(Name) ON DELETE SET NULL);
	
	CREATE TABLE MembershipNames(
	Name VARCHAR2 (15),
	MemShPrice NUMBER (3) ,
	CONSTRAINT Name_PK PRIMARY KEY (Name));
		MembershipOfMember
		
		MembershipNames

Every volunteer has a unique ID	CREAT TABLE Volunteer (VID NUMBER(20), … CONSTRAINT VID_PK PRIMARY KEY(VID));	Volunteer
To volunteer, the volunteer age must be over 15 years' old	ALTER TABLE Volunteer ADD CONSTRAINT CHECK_AGE CHECK(VAge>15); *We will add this constraint after create the volunteer table *	Volunteer
A volunteer must enter his first and last name and his age	CREATE TABLE Volunteer(… VFirst VARCHAR2 (20) NOT NULL, VLast VARCHAR2 (20) NOT NULL, … , VAgae NUMBER(2) NOT NULL, …);	Volunteer
A certificate is only for one volunteer	CREAT TABLE Certificate (C_VID NUMBER(20),… CONSTRAINT C_VID_FK FOREIGN KEY(C_VID) REFRENCES Volunteer(VID) ON DELETE CASCADE;	Certificate

Every certificate has a price	CREAT TABLE Certificate (C_VID NUMBER(20) CertificatePrice NUMBER (6, 2) NOT NULL , …);	Certificate
Each seminar has a unique ID	CREAT TABLE Seminar (SID NUMBER(4), … CONSTRAINT SID_PK PRIMARY KEY (SID));	Seminar

Every seminar must have a title and date	CREATE TABLE Seminar(
	SID NUMBER(4),
	STitle VARCHAR2 (40) NOT NULL,
	SDate DATE NOT NULL, …);
		Seminar

Each seminar must contain at least one customer	CREAT TABLE AttendSeminars (CID NUMBER(20), SID NUMBER(4), CONSTRAINT AttendSeminars_PK PRIMARY KEY(CID,SID), CONSTRAINT A_CID_FK FORIGN KEY (CID) REFRENCES Customer(CID) ON DELETE CASCADE);	AttendSeminars
Only members can take a studying room	CREAT TABLE StudyRoomOfMember (MemberID NUMBER(20), … CONSTRAINT MemberID_FK FORIGN KEY (MemberID)REFRENCES MemberShipOfMember(MemberID) ON DELETE CASCADE, …);	StudyRoomOfMember
The room must be available to be booked	CREAT TABLE StudyRoomOfMember (… SR_Date DATE NOT NULL, …;	StudyRoomOfMember
Every study room has a size and floor number	CREAT TABLE StudyRoom1 (… SR_size VARCHA2(10) NOT NULL, FloorNum NUMBER(2) NOT NULL, …);	StudyRoom1
The size of each study room specifies its price and its specifications	CREAT TABLE StudyRoom2(SR_size VARCHAR2(10), SR_price NUMBER(6,2) NOT NULL, CONSTRAINT SR_size_PK PRIMARY KEY (SR_size), CONSTRAINT SR_price_UNIQUE UNIQUE (SR_price) , …);	StudyRoom2

Each studying room has a unique ID	CREATE TABLE StudyRoom1(
	SR_ID NUMBER(3) ,
	CONSTRAINT SR_ID_PK PRIMARY KEY (SR_ID),…);
		StudyRoom1

Each section has a unique ID	CREAT TABLE Section (SecID NUMBER(20), … CONSTRAINT SecID_PK PRIMARY KEY (SecID),…);	Section
Every section must have a name	CREATE TABLE Section(SecID NUMBER(20),	Section

	SecName VARCHAR2 (35) NOT NULL, …);	

8 Queries and Transactions

8.1 *<Authors who write specific books>*

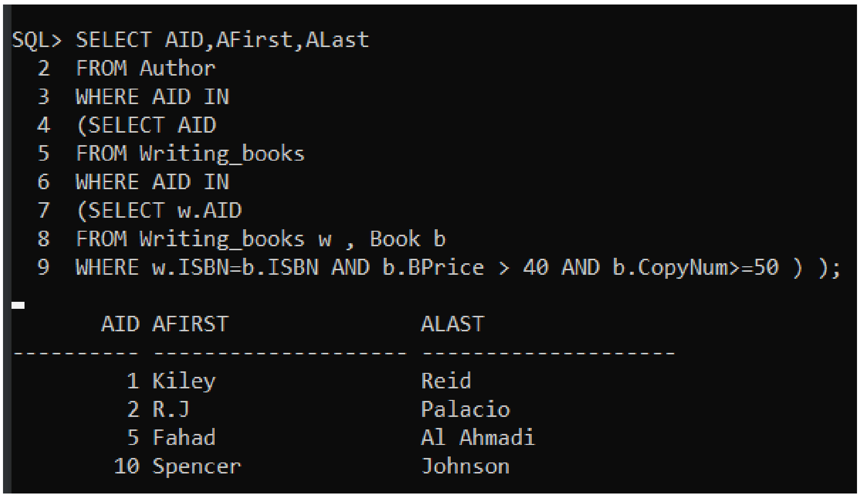
Query in Natural Language (English)

Print IDs, the first name and the last name of authors whose books are more than or equal 50 copies and their price is more than 40.

SQL Script

```
SELECT AID,AFirst,ALast
   FROM Author
   WHERE AID IN
   (SELECT AID
   FROM Writing_books
   WHERE AID IN
   (SELECT w.AID
   FROM Writing_books w , Book b
   WHERE w.ISBN=b.ISBN AND b.BPrice > 40 AND b.CopyNum>=50 ) );
```

Caption of the First Five Rows of the Output



```
SQL> SELECT AID,AFirst,ALast
     FROM Author
     WHERE AID IN
     (SELECT AID
     FROM Writing_books
     WHERE AID IN
     (SELECT w.AID
     FROM Writing_books w , Book b
     WHERE w.ISBN=b.ISBN AND b.BPrice > 40 AND b.CopyNum>=50 ) );

       AID AFIRST               ALAST
---------- -------------------- --------------------
         1 Kiley                Reid
         2 R.J                  Palacio
         5 Fahad                Al Ahmadi
        10 Spencer              Johnson
```

8.2 *<Number of copies of books in some sections>*

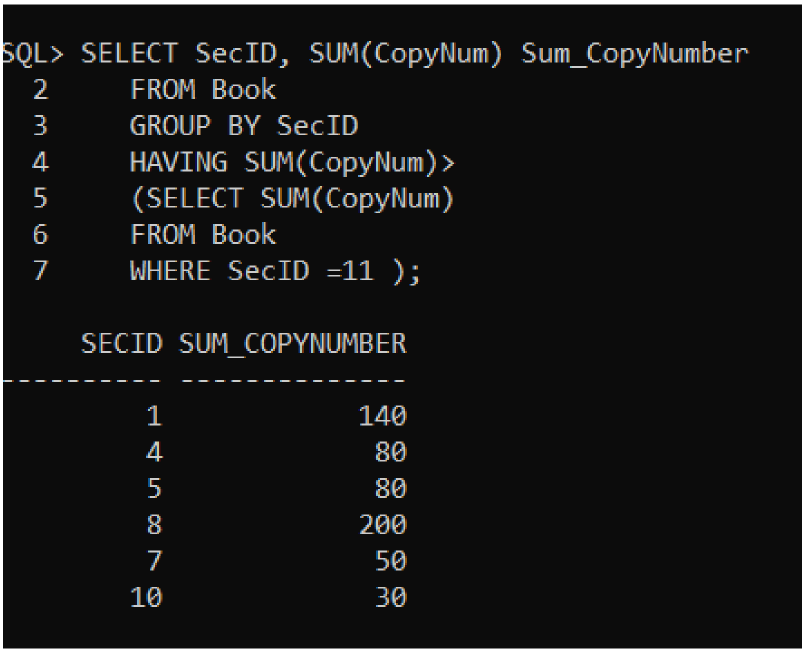
Query in Natural Language (English)

Print the section IDs and number of copies that exist in, for sections that contain a number of copies greater than the number of copies of the eleventh section (SecID = 11)

SQL Script

```
SELECT SecID, SUM(CopyNum) Sum_CopyNumber

  FROM Book

  GROUP BY SecID

  HAVING SUM(CopyNum)>

  (SELECT SUM(CopyNum)

  FROM Book

  WHERE SecID =11 );
```

Caption of the First Five Rows of the Output



```
SQL> SELECT SecID, SUM(CopyNum) Sum_CopyNumber
         FROM Book
         GROUP BY SecID
         HAVING SUM(CopyNum)>
         (SELECT SUM(CopyNum)
         FROM Book
         WHERE SecID =11 );

     SECID SUM_COPYNUMBER
---------- --------------
         1            140
         4             80
         5             80
         8            200
         7             50
        10             30
```

8.3 *<The employee who present seminars>*

Query in Natural Language (English)

Print the IDs, first and last name , phone and the email for the employee who are instructors and present a seminar on Monday evening

SQL Script

SELECT EID , EFirst , ELast , EPhone , EEmail

FROM Employee

WHERE EID IN

(SELECT InstructorID

FROM Instructor)

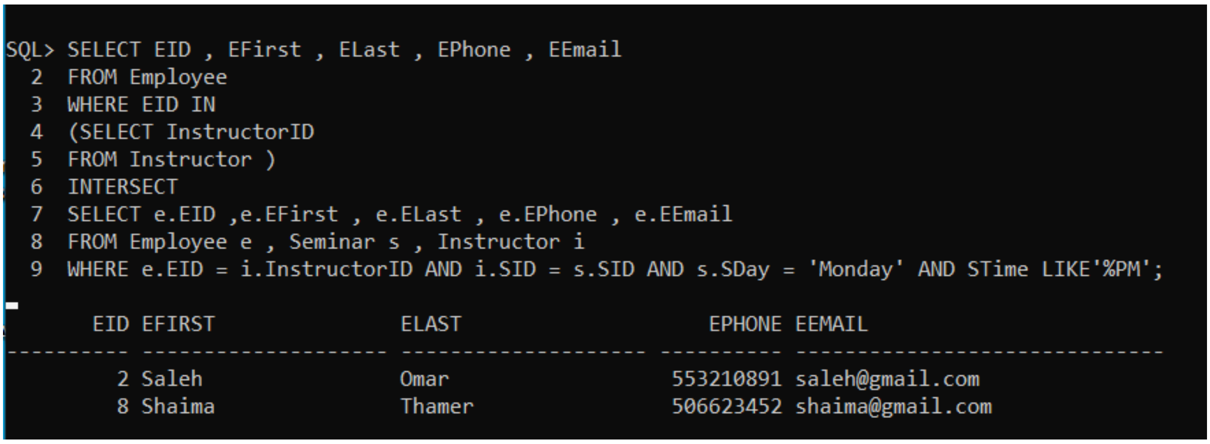
INTERSECT

SELECT e.EID ,e.EFirst , e.ELast , e.EPhone , e.EEmail

FROM Employee e , Seminar s , Instructor i

WHERE e.EID = i.InstructorID AND i.SID = s.SID AND s.SDay = 'Monday' AND STime LIKE'%PM';

Caption of the First Five Rows of the Output



```
SQL> SELECT EID , EFirst , ELast , EPhone , EEmail
     FROM Employee
     WHERE EID IN
     (SELECT InstructorID
     FROM Instructor )
     INTERSECT
     SELECT e.EID ,e.EFirst , e.ELast , e.EPhone , e.EEmail
     FROM Employee e , Seminar s , Instructor i
     WHERE e.EID = i.InstructorID AND i.SID = s.SID AND s.SDay = 'Monday' AND STime LIKE'%PM';

       EID EFIRST               ELAST                    EPHONE EEMAIL
---------- -------------------- -------------------- ---------- ------------------------------
         2 Saleh                Omar                  553210891 saleh@gmail.com
         8 Shaima               Thamer                506623452 shaima@gmail.com
```

8.4 *<Number of volunteer in specific sections>*

Query in Natural Language (English)

Print the number of volunteers in sections where there are more than two volunteers.

SQL Script

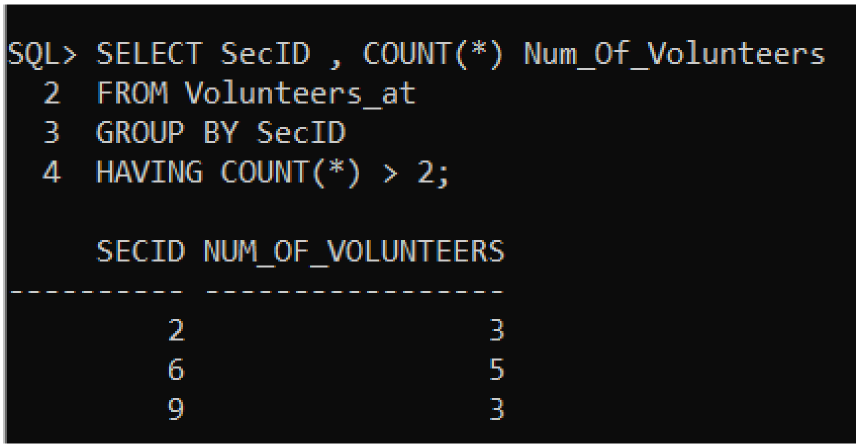
SELECT SecID , COUNT(*) Num_Of_Volunteers

FROM Volunteers_at

GROUP BY SecID

HAVING COUNT(*) > 2;

Caption of the First Five Rows of the Output



```
SQL> SELECT SecID , COUNT(*) Num_Of_Volunteers
  2  FROM Volunteers_at
  3  GROUP BY SecID
  4  HAVING COUNT(*) > 2;

     SECID NUM_OF_VOLUNTEERS
---------- -----------------
         2                 3
         6                 5
         9                 3
```

8.5 *<The highest salary from the sum salaries in each section>*

Query in Natural Language (English)

Print the highest salary out of the total salary in each section

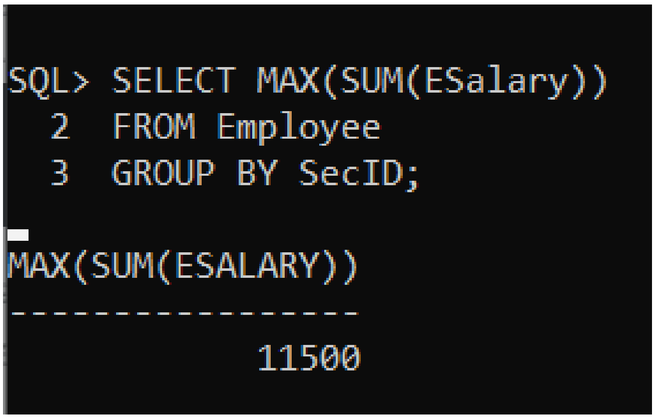
SQL Script

SELECT MAX(SUM(ESalary))

FROM Employee

GROUP BY SecID;

Caption of the First Five Rows of the Output



```
SQL> SELECT MAX(SUM(ESalary))
  2  FROM Employee
  3  GROUP BY SecID;

MAX(SUM(ESALARY))
-----------------
            11500
```

8.6 < *The lowest copies number from the average copies number in each section* >

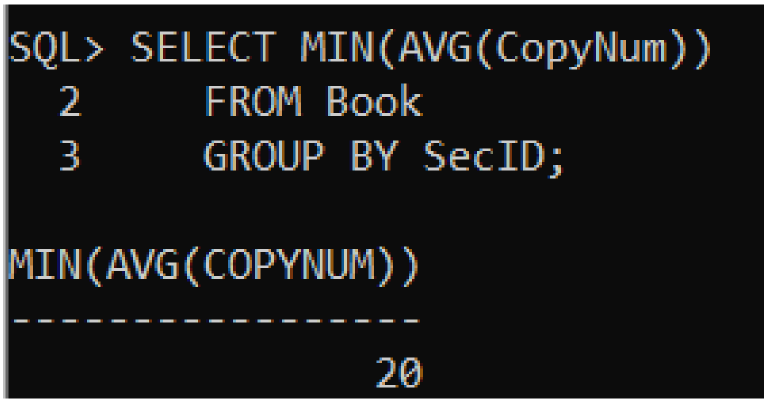
Query in Natural Language (English)

Print the lowest copies number out of the average copies number in each section

SQL Script

```
SELECT MIN(AVG(CopyNum))
  FROM Book
  GROUP BY SecID;
```

Caption of the First Five Rows of the Output



```
SQL> SELECT MIN(AVG(CopyNum))
  2      FROM Book
  3      GROUP BY SecID;

MIN(AVG(COPYNUM))
-----------------
               20
```

8.6 Update Example

Update in Natural Language (English)

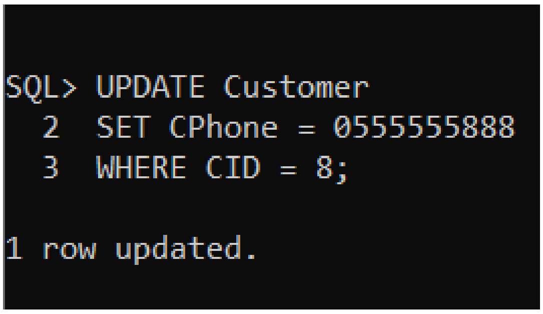
Update the phone number of the customer that has ID number equal 8

SQL Script

UPDATE Customer

SET CPhone = 0555555888

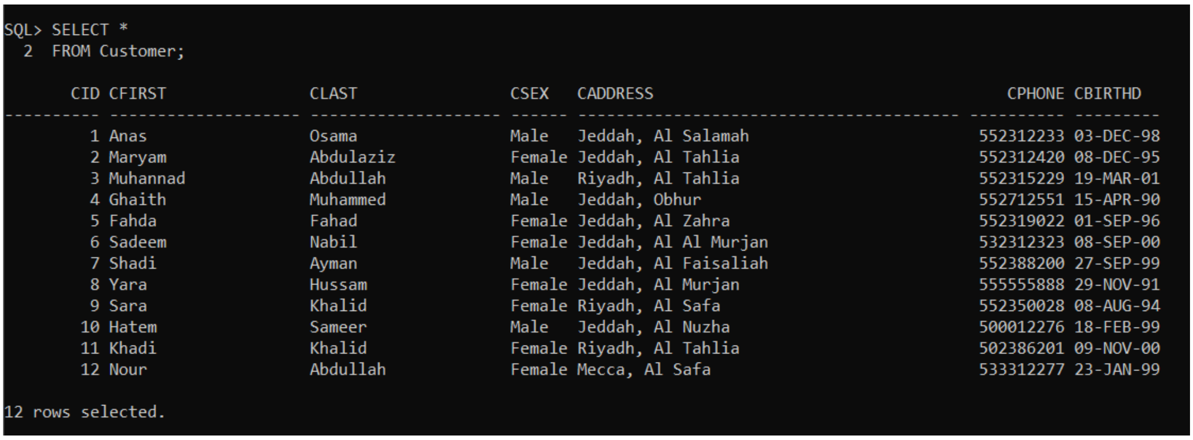
WHERE CID = 8;



```
SQL> UPDATE Customer
  2  SET CPhone = 0555555888
  3  WHERE CID = 8;

1 row updated.
```

Caption of the Output

After the update (you will find the table before the update in APPENDIX)



```
SQL> SELECT *
  2  FROM Customer;

       CID CFIRST               CLAST                CSEX   CADDRESS                                     CPHONE CBIRTHD
---------- -------------------- -------------------- ------ ---------------------------------------- ---------- ---------
         1 Anas                 Osama                Male   Jeddah, Al Salamah                        552312233 03-DEC-98
         2 Maryam               Abdulaziz            Female Jeddah, Al Tahlia                         552312420 08-DEC-95
         3 Muhannad             Abdullah             Male   Riyadh, Al Tahlia                         552315229 19-MAR-01
         4 Ghaith               Muhammed             Male   Jeddah, Obhur                             552712551 15-APR-90
         5 Fahda                Fahad                Female Jeddah, Al Zahra                          552319022 01-SEP-96
         6 Sadeem               Nabil                Female Jeddah, Al Al Murjan                      532312323 08-SEP-00
         7 Shadi                Ayman                Male   Jeddah, Al Faisaliah                      552388200 27-SEP-99
         8 Yara                 Hussam               Female Jeddah, Al Murjan                         555555888 29-NOV-91
         9 Sara                 Khalid               Female Riyadh, Al Safa                           552350028 08-AUG-94
        10 Hatem                Sameer               Male   Jeddah, Al Nuzha                          500012276 18-FEB-99
        11 Khadi                Khalid               Female Riyadh, Al Tahlia                         502386201 09-NOV-00
        12 Nour                 Abdullah             Female Mecca, Al Safa                            533312277 23-JAN-99

12 rows selected.
```

8.7 Delete Example

Delete in Natural Language (English)

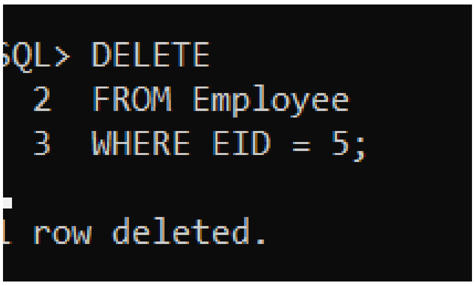
Delete the employee who has ID number 5;

SQL Script

DELETE

FROM Employee

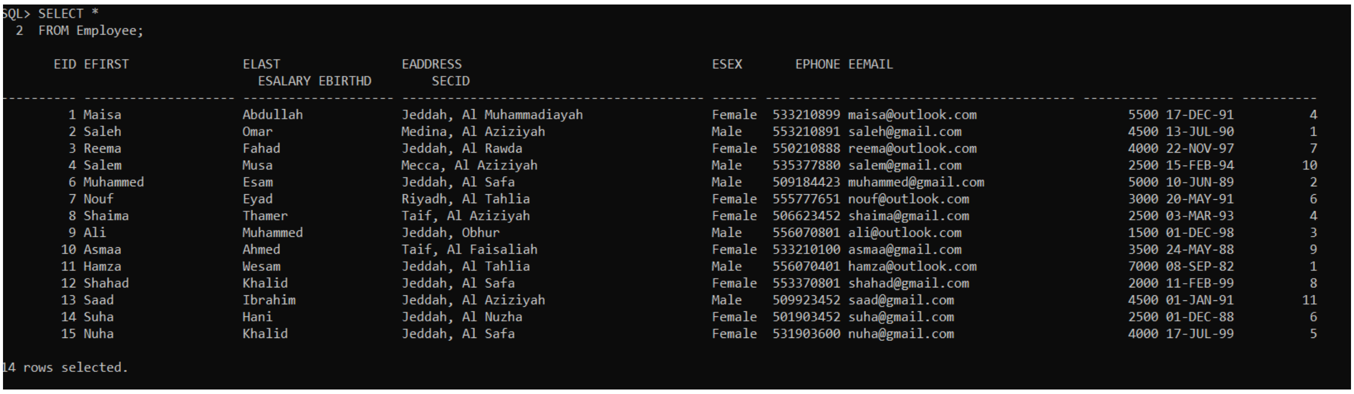
WHERE EID = 5;



```
SQL> DELETE
  2  FROM Employee
  3  WHERE EID = 5;

1 row deleted.
```

Caption of the Output

After the DALETE (you will find the table before the delete in APPENDIX)



```
SQL> SELECT *
  2  FROM Employee;

       EID EFIRST               ELAST                EADDRESS                                 ESEX       EPHONE EEMAIL
                                  ESALARY EBIRTHD         SECID
--------- -------------------- -------------------- ---------------------------------------- ------ ---------- ------------------------------ --------- --------- ----------
        1 Maisa                Abdullah             Jeddah, Al Muhammadiayah                 Female  533210899 maisa@outlook.com                   5500 17-DEC-91          4
        2 Saleh                Omar                 Medina, Al Aziziyah                      Male    553210891 saleh@gmail.com                     4500 13-JUL-90          1
        3 Reema                Fahad                Jeddah, Al Rawda                         Female  550210888 reema@outlook.com                   4000 22-NOV-97          7
        4 Salem                Musa                 Mecca, Al Aziziyah                       Male    535377880 salem@gmail.com                     2500 15-FEB-94         10
        6 Muhammed             Esam                 Jeddah, Al Safa                          Male    509184423 muhammed@gmail.com                  5000 10-JUN-89          2
        7 Nouf                 Eyad                 Riyadh, Al Tahlia                        Female  555777651 nouf@outlook.com                    3000 20-MAY-91          6
        8 Shaima               Thamer               Taif, Al Aziziyah                        Female  506623452 shaima@gmail.com                    2500 03-MAR-93          4
        9 Ali                  Muhammed             Jeddah, Obhur                            Male    556070801 ali@outlook.com                     1500 01-DEC-98          3
       10 Asmaa                Ahmed                Taif, Al Faisaliah                       Female  533210100 asmaa@gmail.com                     3500 24-MAY-88          9
       11 Hamza                Wesam                Jeddah, Al Tahlia                        Male    556070401 hamza@outlook.com                   7000 08-SEP-82          1
       12 Shahad               Khalid               Jeddah, Al Safa                          Female  553370801 shahad@gmail.com                    2000 11-FEB-99          8
       13 Saad                 Ibrahim              Jeddah, Al Aziziyah                      Male    509923452 saad@gmail.com                      4500 01-JAN-91         11
       14 Suha                 Hani                 Jeddah, Al Nuzha                         Female  501903452 suha@gmail.com                      2500 01-DEC-88          6
       15 Nuha                 Khalid               Jeddah, Al Safa                          Female  531903600 nuha@gmail.com                      4000 17-JUL-99          5

14 rows selected.
```

8.8 Delete Example

Delete in Natural Language (English)

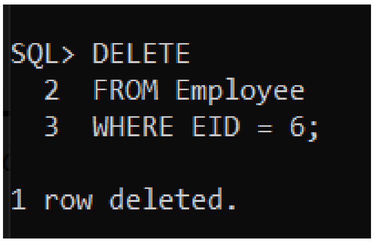
Delete the employee who has ID number 6;

SQL Script

DELETE

FROM Employee

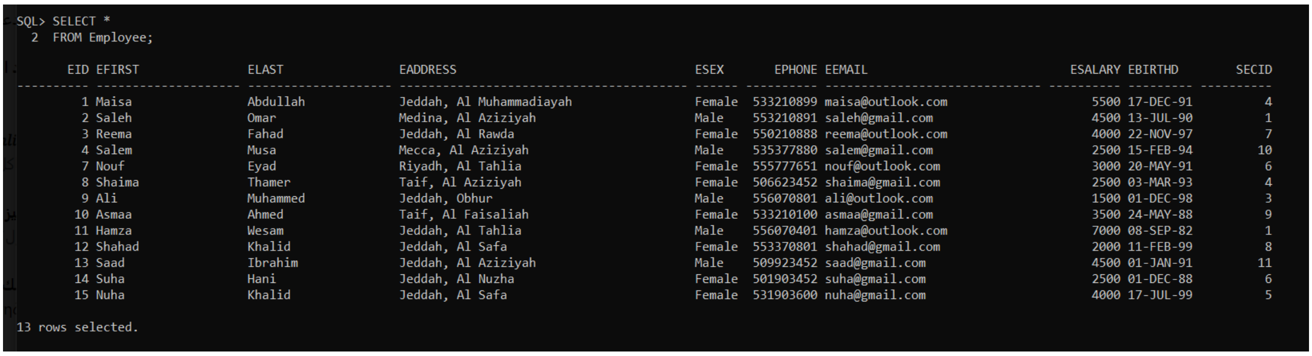
WHERE EID = 6;



```
SQL> DELETE
  2  FROM Employee
  3  WHERE EID = 6;

1 row deleted.
```

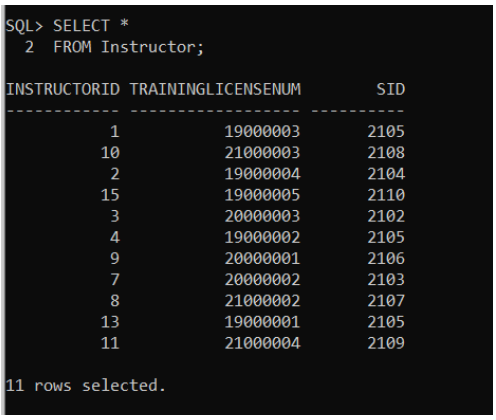
<u>Caption of the Output</u>

<u>After the DALETE (you will find the table before the delete in APPENDIX)</u>



```
SQL> SELECT *
  2  FROM Employee;

       EID EFIRST               ELAST                EADDRESS                                 ESEX       EPHONE EEMAIL                            ESALARY EBIRTHD        SECID
---------- -------------------- -------------------- ---------------------------------------- ------ ---------- ------------------------------ ---------- --------- ----------
         1 Maisa                Abdullah             Jeddah, Al Muhammadiayah                 Female  533210899 maisa@outlook.com                    5500 17-DEC-91          4
         2 Saleh                Omar                 Medina, Al Aziziyah                      Male     553210891 saleh@gmail.com                      4500 13-JUL-90          1
         3 Reema                Fahad                Jeddah, Al Rawda                         Female  550210888 reema@outlook.com                    4000 22-NOV-97          7
         4 Salem                Musa                 Mecca, Al Aziziyah                       Male     535377880 salem@gmail.com                      2500 15-FEB-94         10
         7 Nouf                 Eyad                 Riyadh, Al Tahlia                        Female  555777651 nouf@outlook.com                     3000 20-MAY-91          6
         8 Shaima               Thamer               Taif, Al Aziziyah                        Female  506623452 shaima@gmail.com                     2500 03-MAR-93          4
         9 Ali                  Muhammed             Jeddah, Obhur                            Male     556070801 ali@outlook.com                      1500 01-DEC-98          3
        10 Asmaa                Ahmed                Taif, Al Faisaliah                       Female  533210100 asmaa@gmail.com                      3500 24-MAY-88          9
        11 Hamza                Wesam                Jeddah, Al Tahlia                        Male     556070401 hamza@outlook.com                    7000 08-SEP-82          1
        12 Shahad               Khalid               Jeddah, Al Safa                          Female  553370801 shahad@gmail.com                     2000 11-FEB-99          8
        13 Saad                 Ibrahim              Jeddah, Al Aziziyah                      Male     509923452 saad@gmail.com                       4500 01-JAN-91         11
        14 Suha                 Hani                 Jeddah, Al Nuzha                         Female  501903452 suha@gmail.com                       2500 01-DEC-88          6
        15 Nuha                 Khalid               Jeddah, Al Safa                          Female  531903600 nuha@gmail.com                       4000 17-JUL-99          5

13 rows selected.
```

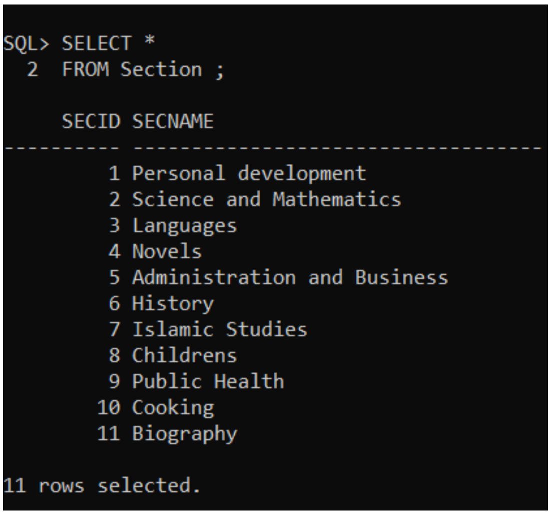
The instructor id with NO 6 is also deleted from Instructor table (it is a FK points to the deleted PK) → because we used ON DELETE CASCADE



```
SQL> SELECT *
  2  FROM Instructor;

INSTRUCTORID TRAININGLICENSENUM        SID
------------ ------------------ ----------
           1           19000003       2105
          10           21000003       2108
           2           19000004       2104
          15           19000005       2110
           3           20000003       2102
           4           19000002       2105
           9           20000001       2106
           7           20000002       2103
           8           21000002       2107
          13           19000001       2105
          11           21000004       2109

11 rows selected.
```

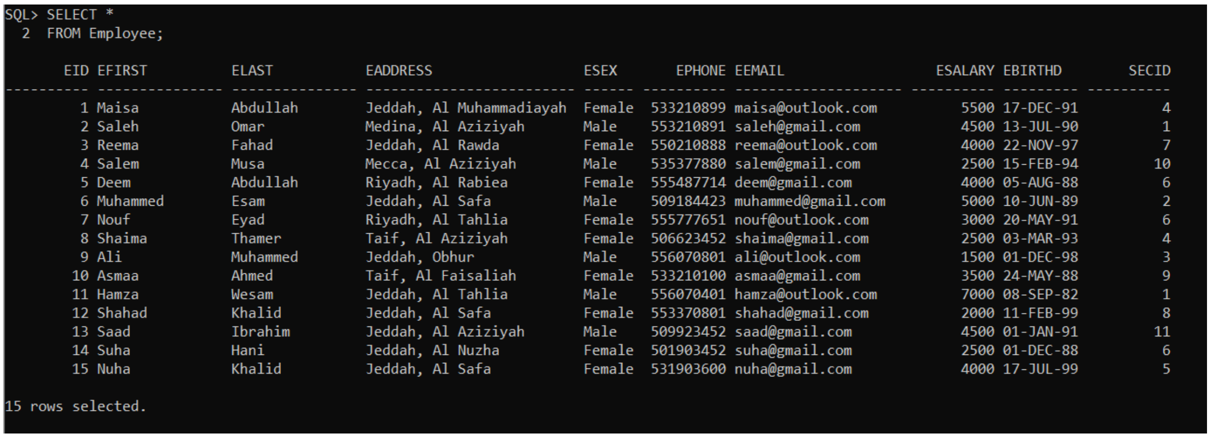
APPENDIX

Section table



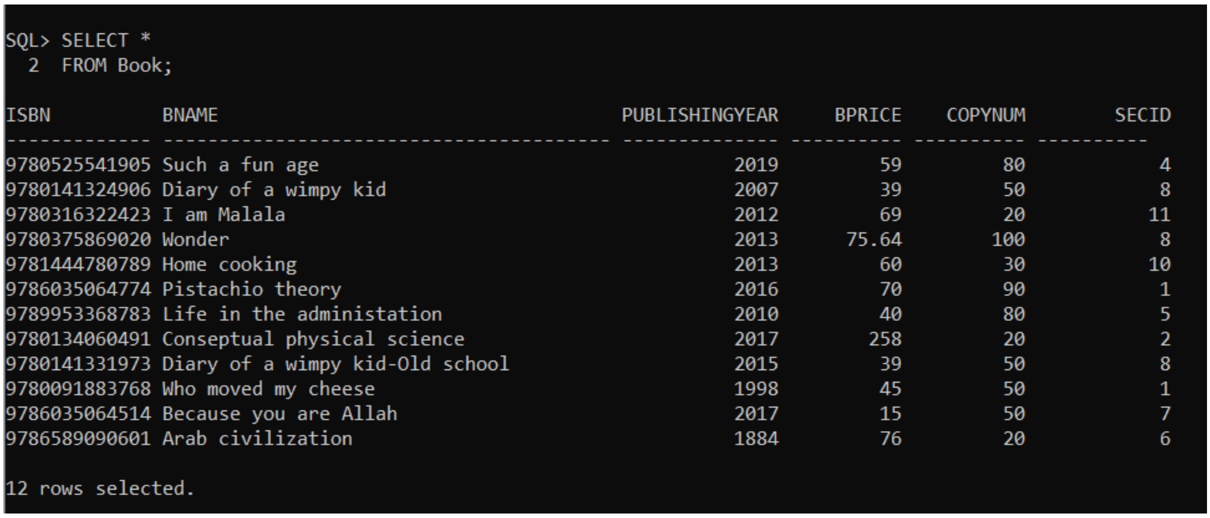
```
SQL> SELECT *
  2  FROM Section ;

     SECID SECNAME
---------- ----------------------------------
         1 Personal development
         2 Science and Mathematics
         3 Languages
         4 Novels
         5 Administration and Business
         6 History
         7 Islamic Studies
         8 Childrens
         9 Public Health
        10 Cooking
        11 Biography

11 rows selected.
```

Employee table



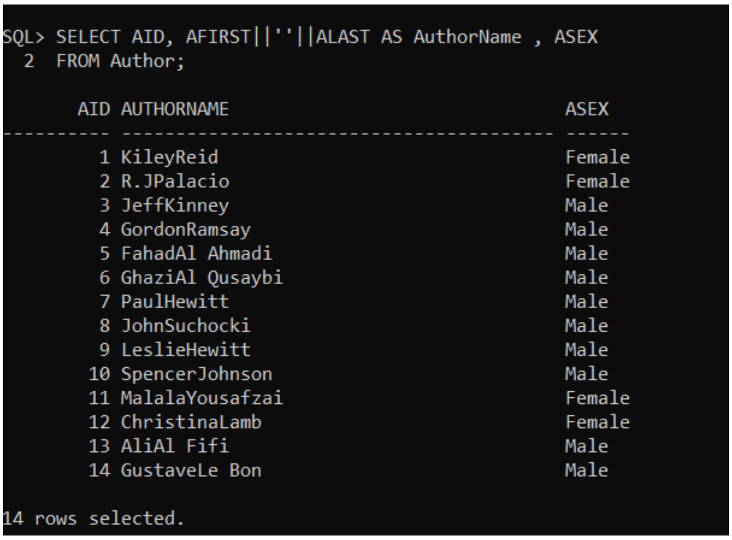
```
SQL> SELECT *
  2  FROM Employee;

       EID EFIRST          ELAST           EADDRESS                  ESEX       EPHONE EEMAIL                  ESALARY EBIRTHD        SECID
---------- --------------- --------------- ------------------------- ------ ---------- -------------------- ---------- --------- ----------
         1 Maisa           Abdullah        Jeddah, Al Muhammadiayah  Female  533210899 maisa@outlook.com          5500 17-DEC-91          4
         2 Saleh           Omar            Medina, Al Aziziyah       Male    553210891 saleh@gmail.com            4500 13-JUL-90          1
         3 Reema           Fahad           Jeddah, Al Rawda          Female  550210888 reema@outlook.com          4000 22-NOV-97          7
         4 Salem           Musa            Mecca, Al Aziziyah        Male    535377880 salem@gmail.com            2500 15-FEB-94         10
         5 Deem            Abdullah        Riyadh, Al Rabiea         Female  555487714 deem@gmail.com             4000 05-AUG-88          6
         6 Muhammed        Esam            Jeddah, Al Safa           Male    509184423 muhammed@gmail.com         5000 10-JUN-89          2
         7 Nouf            Eyad            Riyadh, Al Tahlia         Female  555777651 nouf@outlook.com           3000 20-MAY-91          6
         8 Shaima          Thamer          Taif, Al Aziziyah         Female  506623452 shaima@gmail.com           2500 03-MAR-93          4
         9 Ali             Muhammed        Jeddah, Obhur             Male    556070801 ali@outlook.com            1500 01-DEC-98          3
        10 Asmaa           Ahmed           Taif, Al Faisaliah        Female  533210100 asmaa@gmail.com            3500 24-MAY-88          9
        11 Hamza           Wesam           Jeddah, Al Tahlia         Male    556070401 hamza@outlook.com          7000 08-SEP-82          1
        12 Shahad          Khalid          Jeddah, Al Safa           Female  553370801 shahad@gmail.com           2000 11-FEB-99          8
        13 Saad            Ibrahim         Jeddah, Al Aziziyah       Male    509923452 saad@gmail.com             4500 01-JAN-91         11
        14 Suha            Hani            Jeddah, Al Nuzha          Female  501903452 suha@gmail.com             2500 01-DEC-88          6
        15 Nuha            Khalid          Jeddah, Al Safa           Female  531903600 nuha@gmail.com             4000 17-JUL-99          5

15 rows selected.
```

Book table



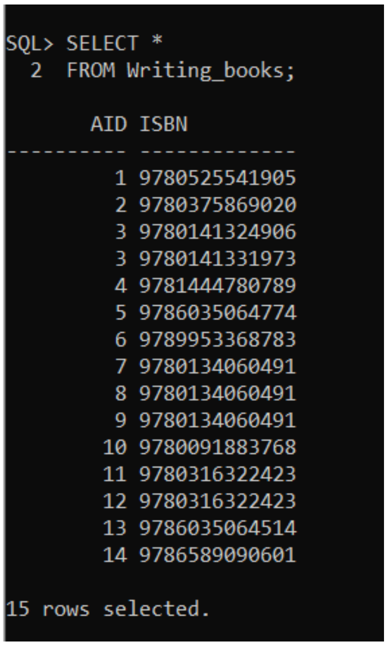
```
SQL> SELECT *
  2  FROM Book;

ISBN          BNAME                                    PUBLISHINGYEAR     BPRICE    COPYNUM      SECID
------------- ---------------------------------------- -------------- ---------- ---------- ----------
9780525541905 Such a fun age                                     2019         59         80          4
9780141324906 Diary of a wimpy kid                               2007         39         50          8
9780316322423 I am Malala                                        2012         69         20         11
9780375869020 Wonder                                             2013      75.64        100          8
9781444780789 Home cooking                                       2013         60         30         10
9786035064774 Pistachio theory                                   2016         70         90          1
9789953368783 Life in the administation                          2010         40         80          5
9780134060491 Conseptual physical science                        2017        258         20          2
9780141331973 Diary of a wimpy kid-Old school                    2015         39         50          8
9780091883768 Who moved my cheese                                1998         45         50          1
9786035064514 Because you are Allah                              2017         15         50          7
9786589090601 Arab civilization                                  1884         76         20          6

12 rows selected.
```

Author table



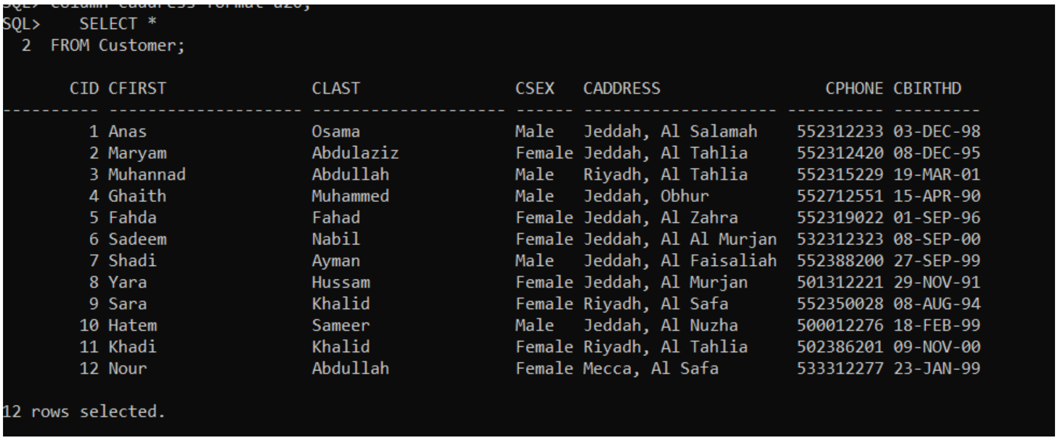
```
SQL> SELECT AID, AFIRST||''||ALAST AS AuthorName , ASEX
  2  FROM Author;

       AID AUTHORNAME                               ASEX
---------- ---------------------------------------- ------
         1 KileyReid                                Female
         2 R.JPalacio                               Female
         3 JeffKinney                               Male
         4 GordonRamsay                             Male
         5 FahadAl Ahmadi                           Male
         6 GhaziAl Qusaybi                          Male
         7 PaulHewitt                               Male
         8 JohnSuchocki                             Male
         9 LeslieHewitt                             Male
        10 SpencerJohnson                           Male
        11 MalalaYousafzai                          Female
        12 ChristinaLamb                            Female
        13 AliAl Fifi                               Male
        14 GustaveLe Bon                            Male

14 rows selected.
```

Writing_books table



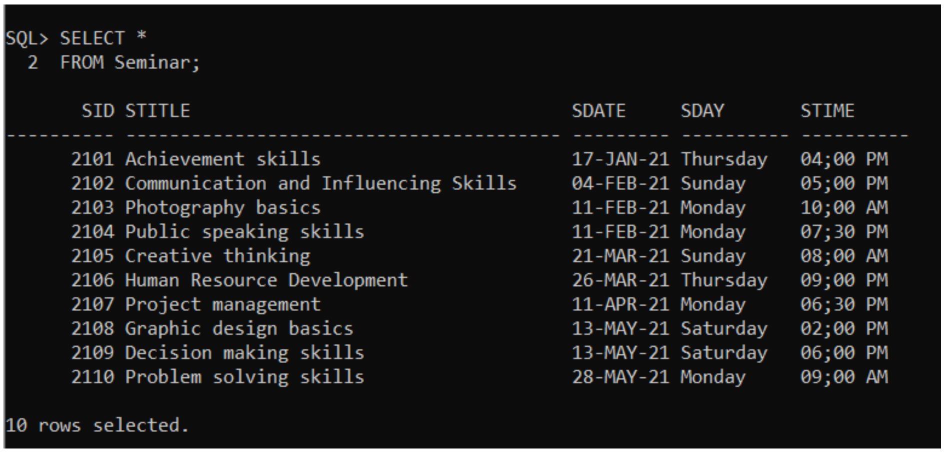
```
SQL> SELECT *
  2  FROM Writing_books;

       AID ISBN
---------- -------------
         1 9780525541905
         2 9780375869020
         3 9780141324906
         3 9780141331973
         4 9781444780789
         5 9786035064774
         6 9789953368783
         7 9780134060491
         8 9780134060491
         9 9780134060491
        10 9780091883768
        11 9780316322423
        12 9780316322423
        13 9786035064514
        14 9786589090601

15 rows selected.
```

Customer table



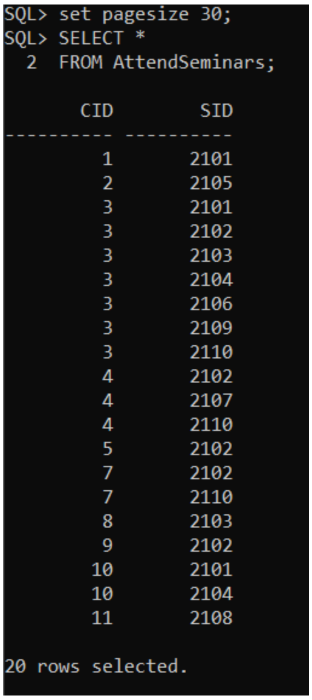
```
SQL> column caddress format a20;
SQL>    SELECT *
  2  FROM Customer;

      CID CFIRST               CLAST                CSEX   CADDRESS                 CPHONE CBIRTHD
--------- -------------------- -------------------- ------ -------------------- ---------- ---------
        1 Anas                 Osama                Male   Jeddah, Al Salamah    552312233 03-DEC-98
        2 Maryam               Abdulaziz            Female Jeddah, Al Tahlia     552312420 08-DEC-95
        3 Muhannad             Abdullah             Male   Riyadh, Al Tahlia     552315229 19-MAR-01
        4 Ghaith               Muhammed             Male   Jeddah, Obhur         552712551 15-APR-90
        5 Fahda                Fahad                Female Jeddah, Al Zahra      552319022 01-SEP-96
        6 Sadeem               Nabil                Female Jeddah, Al Al Murjan  532312323 08-SEP-00
        7 Shadi                Ayman                Male   Jeddah, Al Faisaliah  552388200 27-SEP-99
        8 Yara                 Hussam               Female Jeddah, Al Murjan     501312221 29-NOV-91
        9 Sara                 Khalid               Female Riyadh, Al Safa       552350028 08-AUG-94
       10 Hatem                Sameer               Male   Jeddah, Al Nuzha      500012276 18-FEB-99
       11 Khadi                Khalid               Female Riyadh, Al Tahlia     502386201 09-NOV-00
       12 Nour                 Abdullah             Female Mecca, Al Safa        533312277 23-JAN-99

12 rows selected.
```

Seminar table



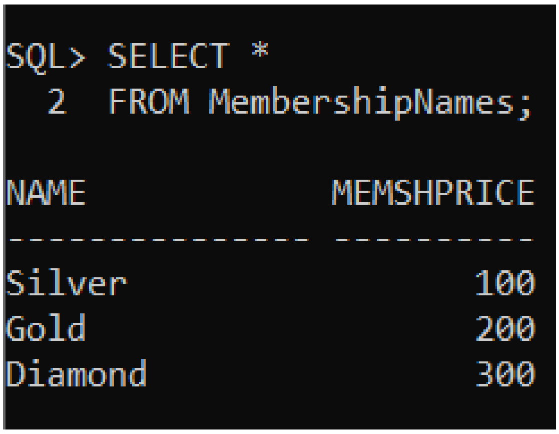
```
SQL> SELECT *
  2  FROM Seminar;

       SID STITLE                                   SDATE     SDAY       STIME
---------- ---------------------------------------- --------- ---------- ----------
      2101 Achievement skills                       17-JAN-21 Thursday   04;00 PM
      2102 Communication and Influencing Skills     04-FEB-21 Sunday     05;00 PM
      2103 Photography basics                       11-FEB-21 Monday     10;00 AM
      2104 Public speaking skills                   11-FEB-21 Monday     07;30 PM
      2105 Creative thinking                        21-MAR-21 Sunday     08;00 AM
      2106 Human Resource Development               26-MAR-21 Thursday   09;00 PM
      2107 Project management                       11-APR-21 Monday     06;30 PM
      2108 Graphic design basics                    13-MAY-21 Saturday   02;00 PM
      2109 Decision making skills                   13-MAY-21 Saturday   06;00 PM
      2110 Problem solving skills                   28-MAY-21 Monday     09;00 AM

10 rows selected.
```

AttendSeminars table



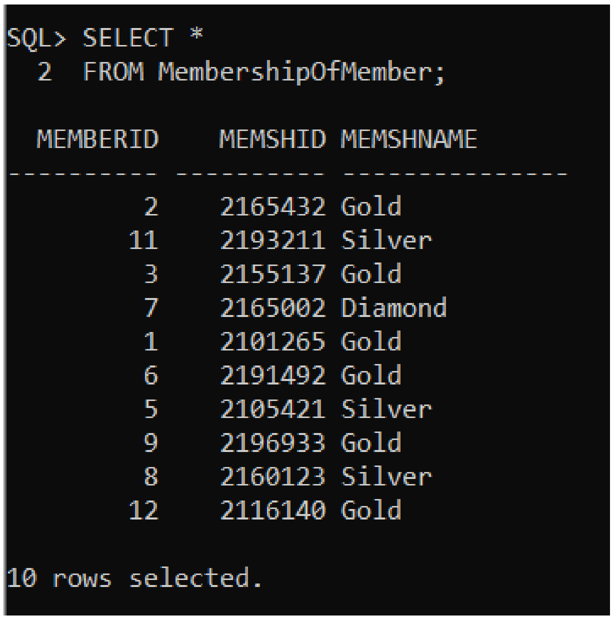
```
SQL> set pagesize 30;
SQL> SELECT *
  2  FROM AttendSeminars;

       CID        SID
---------- ----------
         1       2101
         2       2105
         3       2101
         3       2102
         3       2103
         3       2104
         3       2106
         3       2109
         3       2110
         4       2102
         4       2107
         4       2110
         5       2102
         7       2102
         7       2110
         8       2103
         9       2102
        10       2101
        10       2104
        11       2108

20 rows selected.
```

MembershipNames table



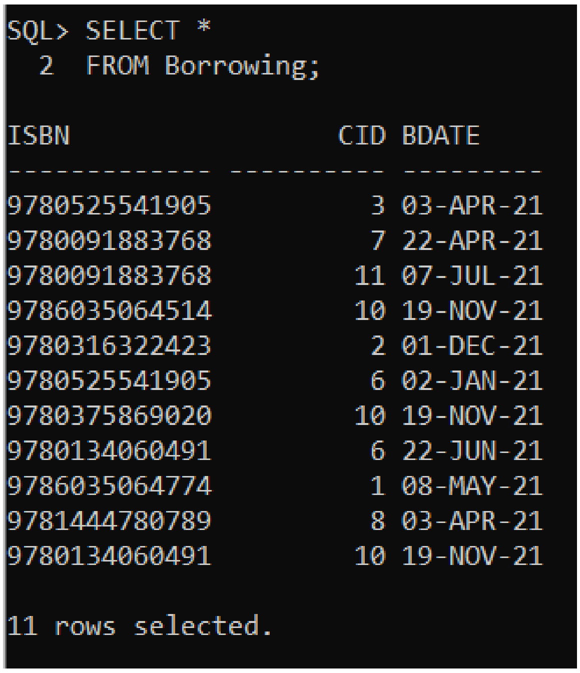
```
SQL> SELECT *
  2  FROM MembershipNames;

NAME            MEMSHPRICE
--------------- ----------
Silver                 100
Gold                   200
Diamond                300
```

MembershipOfMember table



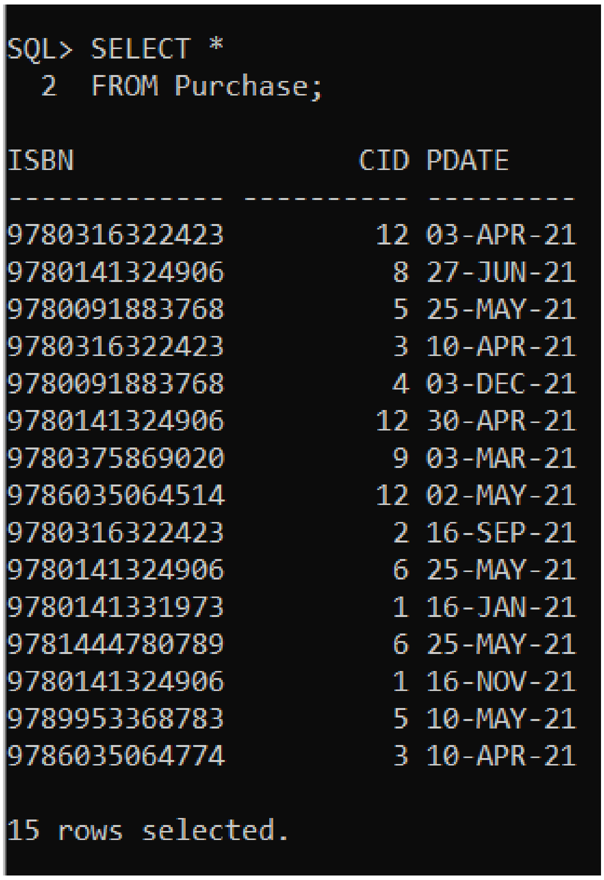
```
SQL> SELECT *
  2  FROM MembershipOfMember;

  MEMBERID    MEMSHID MEMSHNAME
---------- ---------- ---------------
         2    2165432 Gold
        11    2193211 Silver
         3    2155137 Gold
         7    2165002 Diamond
         1    2101265 Gold
         6    2191492 Gold
         5    2105421 Silver
         9    2196933 Gold
         8    2160123 Silver
        12    2116140 Gold

10 rows selected.
```

Borrowing table



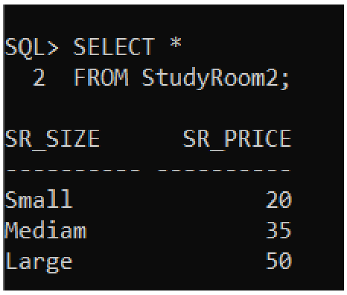
```
SQL> SELECT *
  2  FROM Borrowing;

ISBN                 CID BDATE
------------- ---------- ---------
9780525541905          3 03-APR-21
9780091883768          7 22-APR-21
9780091883768         11 07-JUL-21
9786035064514         10 19-NOV-21
9780316322423          2 01-DEC-21
9780525541905          6 02-JAN-21
9780375869020         10 19-NOV-21
9780134060491          6 22-JUN-21
9786035064774          1 08-MAY-21
9781444780789          8 03-APR-21
9780134060491         10 19-NOV-21

11 rows selected.
```

Purchase table



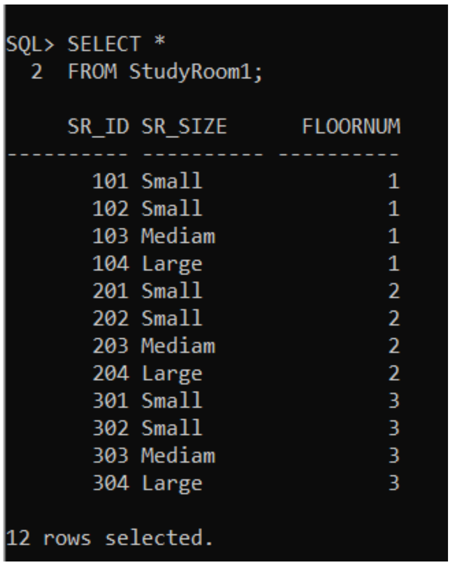
```
SQL> SELECT *
  2  FROM Purchase;

ISBN                 CID PDATE
------------- ---------- ---------
9780316322423         12 03-APR-21
9780141324906          8 27-JUN-21
9780091883768          5 25-MAY-21
9780316322423          3 10-APR-21
9780091883768          4 03-DEC-21
9780141324906         12 30-APR-21
9780375869020          9 03-MAR-21
9786035064514         12 02-MAY-21
9780316322423          2 16-SEP-21
9780141324906          6 25-MAY-21
9780141331973          1 16-JAN-21
9781444780789          6 25-MAY-21
9780141324906          1 16-NOV-21
9789953368783          5 10-MAY-21
9786035064774          3 10-APR-21

15 rows selected.
```

StudyRoom2 table



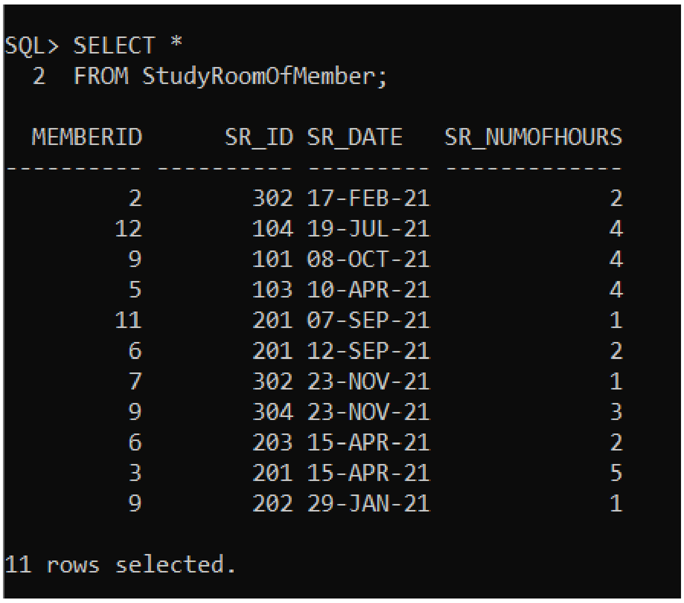
```
SQL> SELECT *
  2  FROM StudyRoom2;

SR_SIZE      SR_PRICE
---------- ----------
Small              20
Mediam             35
Large              50
```

StudyRoom1 table



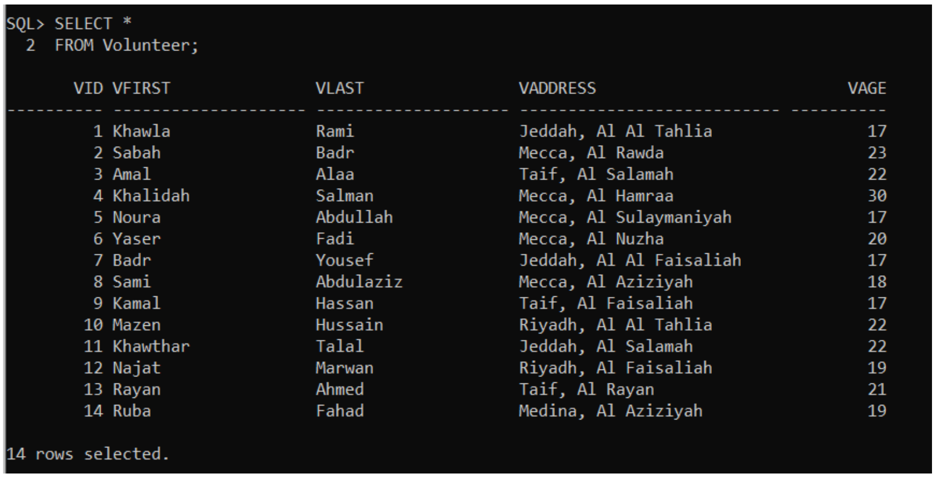
```
SQL> SELECT *
  2  FROM StudyRoom1;

     SR_ID SR_SIZE      FLOORNUM
---------- ---------- ----------
       101 Small               1
       102 Small               1
       103 Mediam              1
       104 Large               1
       201 Small               2
       202 Small               2
       203 Mediam              2
       204 Large               2
       301 Small               3
       302 Small               3
       303 Mediam              3
       304 Large               3

12 rows selected.
```

StudyRoomOfMember table



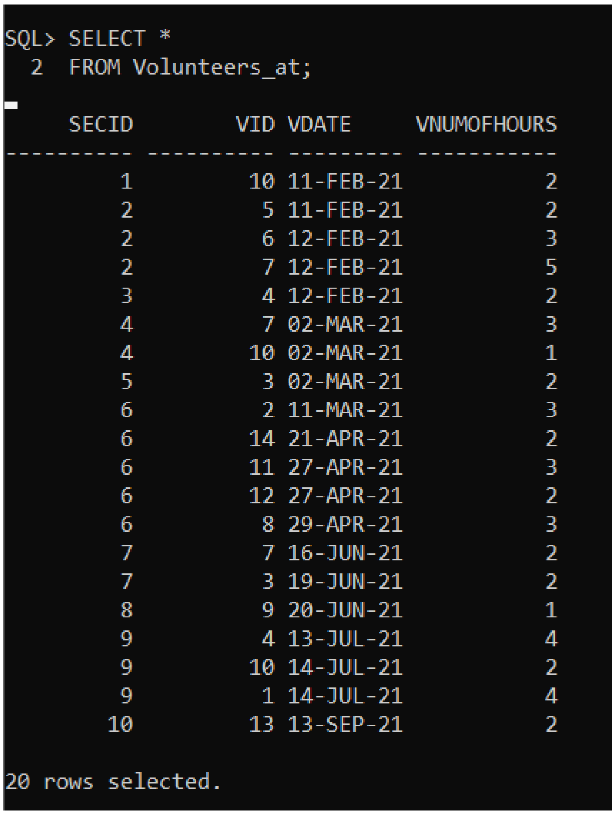
```
SQL> SELECT *
  2  FROM StudyRoomOfMember;

  MEMBERID      SR_ID SR_DATE   SR_NUMOFHOURS
---------- ---------- --------- -------------
         2        302 17-FEB-21             2
        12        104 19-JUL-21             4
         9        101 08-OCT-21             4
         5        103 10-APR-21             4
        11        201 07-SEP-21             1
         6        201 12-SEP-21             2
         7        302 23-NOV-21             1
         9        304 23-NOV-21             3
         6        203 15-APR-21             2
         3        201 15-APR-21             5
         9        202 29-JAN-21             1

11 rows selected.
```

Volunteer table



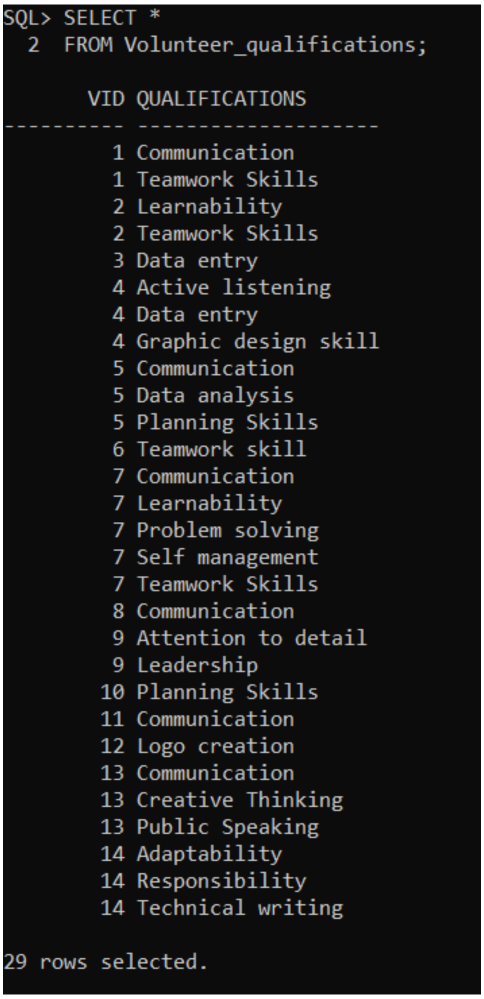
```
SQL> SELECT *
  2  FROM Volunteer;

       VID VFIRST               VLAST                VADDRESS                         VAGE
---------- -------------------- -------------------- -------------------------- ----------
         1 Khawla               Rami                 Jeddah, Al Al Tahlia               17
         2 Sabah                Badr                 Mecca, Al Rawda                    23
         3 Amal                 Alaa                 Taif, Al Salamah                   22
         4 Khalidah             Salman               Mecca, Al Hamraa                   30
         5 Noura                Abdullah             Mecca, Al Sulaymaniyah             17
         6 Yaser                Fadi                 Mecca, Al Nuzha                    20
         7 Badr                 Yousef               Jeddah, Al Al Faisaliah            17
         8 Sami                 Abdulaziz            Mecca, Al Aziziyah                 18
         9 Kamal                Hassan               Taif, Al Faisaliah                 17
        10 Mazen                Hussain              Riyadh, Al Al Tahlia               22
        11 Khawthar             Talal                Jeddah, Al Salamah                 22
        12 Najat                Marwan               Riyadh, Al Faisaliah               19
        13 Rayan                Ahmed                Taif, Al Rayan                     21
        14 Ruba                 Fahad                Medina, Al Aziziyah                19

14 rows selected.
```

Volunteer_at table



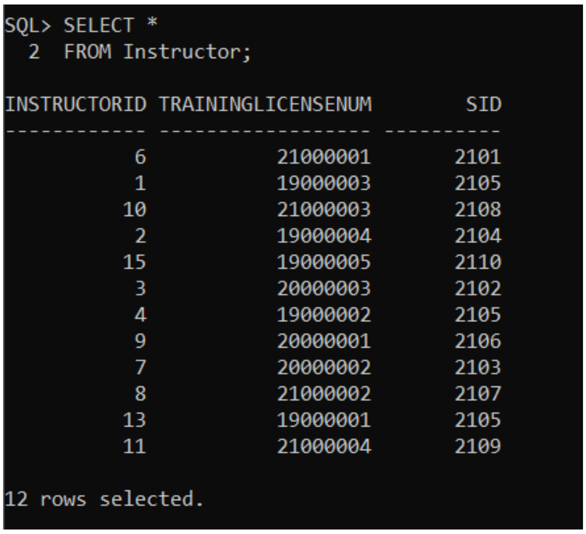
```
SQL> SELECT *
  2  FROM Volunteers_at;

     SECID        VID VDATE     VNUMOFHOURS
---------- ---------- --------- -----------
         1         10 11-FEB-21           2
         2          5 11-FEB-21           2
         2          6 12-FEB-21           3
         2          7 12-FEB-21           5
         3          4 12-FEB-21           2
         4          7 02-MAR-21           3
         4         10 02-MAR-21           1
         5          3 02-MAR-21           2
         6          2 11-MAR-21           3
         6         14 21-APR-21           2
         6         11 27-APR-21           3
         6         12 27-APR-21           2
         6          8 29-APR-21           3
         7          7 16-JUN-21           2
         7          3 19-JUN-21           2
         8          9 20-JUN-21           1
         9          4 13-JUL-21           4
         9         10 14-JUL-21           2
         9          1 14-JUL-21           4
        10         13 13-SEP-21           2

20 rows selected.
```

Volunteer_qualifications table



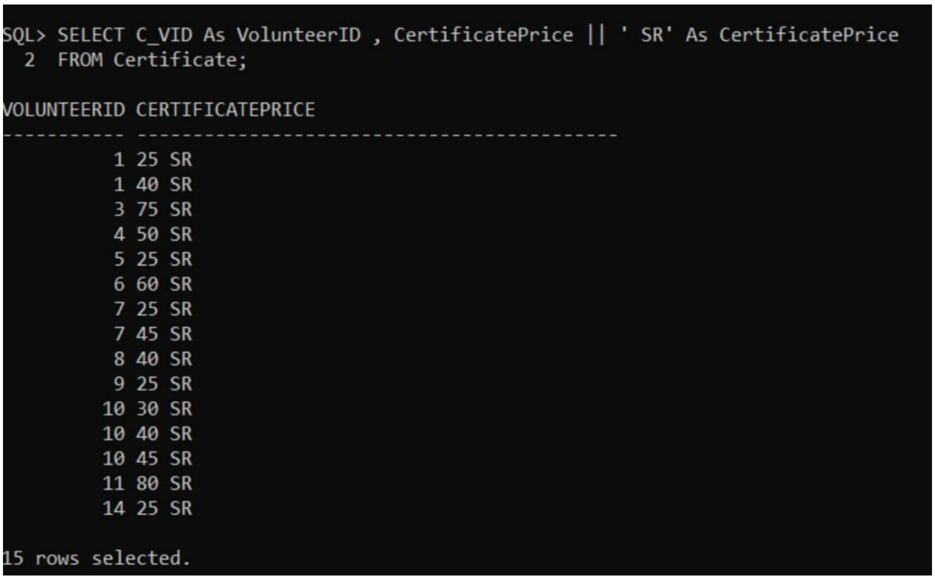
```
SQL> SELECT *
  2  FROM Volunteer_qualifications;

       VID QUALIFICATIONS
---------- --------------------
         1 Communication
         1 Teamwork Skills
         2 Learnability
         2 Teamwork Skills
         3 Data entry
         4 Active listening
         4 Data entry
         4 Graphic design skill
         5 Communication
         5 Data analysis
         5 Planning Skills
         6 Teamwork skill
         7 Communication
         7 Learnability
         7 Problem solving
         7 Self management
         7 Teamwork Skills
         8 Communication
         9 Attention to detail
         9 Leadership
        10 Planning Skills
        11 Communication
        12 Logo creation
        13 Communication
        13 Creative Thinking
        13 Public Speaking
        14 Adaptability
        14 Responsibility
        14 Technical writing

29 rows selected.
```

Instructor table



```
SQL> SELECT *
  2  FROM Instructor;

INSTRUCTORID TRAININGLICENSENUM        SID
------------ ------------------ ----------
           6           21000001       2101
           1           19000003       2105
          10           21000003       2108
           2           19000004       2104
          15           19000005       2110
           3           20000003       2102
           4           19000002       2105
           9           20000001       2106
           7           20000002       2103
           8           21000002       2107
          13           19000001       2105
          11           21000004       2109

12 rows selected.
```

Certificate table



```
SQL> SELECT C_VID As VolunteerID , CertificatePrice || ' SR' As CertificatePrice
  2  FROM Certificate;

VOLUNTEERID CERTIFICATEPRICE
----------- -------------------------------------------
          1 25 SR
          1 40 SR
          3 75 SR
          4 50 SR
          5 25 SR
          6 60 SR
          7 25 SR
          7 45 SR
          8 40 SR
          9 25 SR
         10 30 SR
         10 40 SR
         10 45 SR
         11 80 SR
         14 25 SR

15 rows selected.
```