



INFORMATICS
INSTITUTE OF
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Acknowledge

I would like to take this opportunity to thank all the IIT staff for giving us the opportunity to follow the degree artificial intelligence & data science and also

I specially thank my both lecturer and tutor Mr. Prasan Yapa and Mrs. Dileeka Alwis for giving me the knowledge to do this report. Rather than the academic knowledge I got a lot of information while gathering information. So, at last, I would like to take the opportunity to thank for all the feedbacks that you provided for me and it really helped me to correct all our mistakes.

Thank you

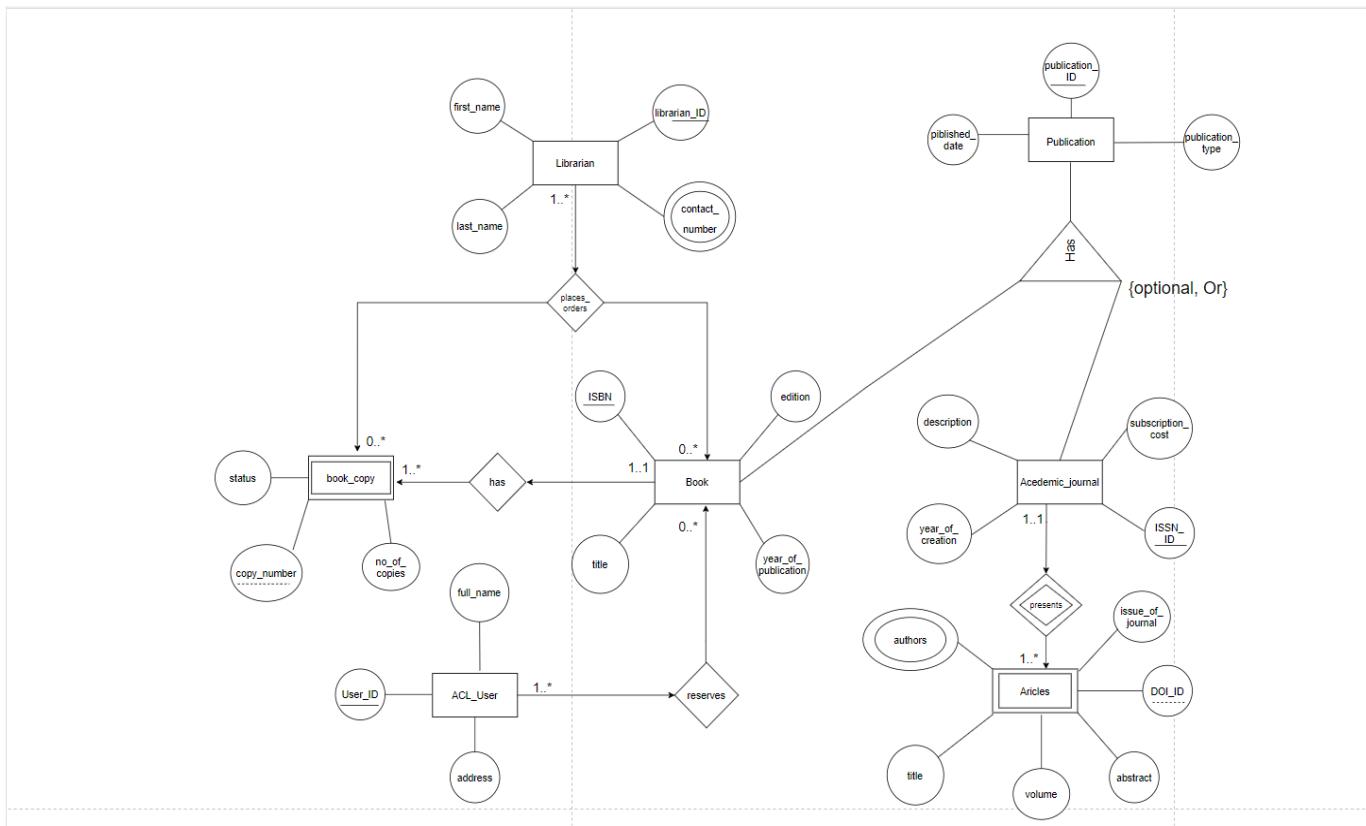
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Question 1

Provide a complete Conceptual Entity-Relationship Diagram for ACL. This needs to include all the entity types, relationship types, multiplicity constraints, attributes, and primary keys. This needs to fit on one page of the report. Mention all the appropriate assumptions which you have made.

Diagram of the ER diagram



Assumptions :

- `contact_num` is taken as a multi values attribute in the `librarian` entity
- Instead of taking `publication_ID` in both `acedemic_journal` and `book`, unique IDs are generated for both of them. (`ISBN` & `ISSN`)

- librarian provides orders for books and book_copies. So this is taken as a ternary relationship. Therefore in the logical schema a new table has been created as place_orders
- ACL_user can place reservation either for a book or book copy
- authors is a multi-valued attribute in the article entity. So when it comes to the logical schema there will be a new relation
- both book_copy & Articles are weak entities
- authors which is articles entity was taken as a multi- valued attribute
- Since there can be things in a library other than books and academic journals in a library it was taken as optional or

Question 2

Provide a complete Logical Relational Schema Diagram for ACL. This needs to include all the correct relations, relationships, multiplicity constraints, attributes, primary keys, and foreign keys. This needs to fit on one page of the report. Mention all the appropriate assumptions which you have made.

Adopting to normalizing techniques

UNF

- It is in UDF at the beginning
- Since contact_number which is in librarian entity is a multi-values attribute, it should be removed by creating a new relation called lib_contact with the primary key librarian key
- Since authors which was in article relation is a multi-valued attribute it is being removed and included in a new relation called authors where the primary key is DOI
- Once these two are done the UDF will normalized to 1NF

1NF

Once the 1st normalization is completed a new relations should be created for lib_contact & authors

Lib_contact (librarian_ID{PK}, contact_number)

librarian (librarian_ID{PK}, first_name, last_name)

lib_contact (librarian_ID{PK}, contact_number{PK})

book (ISBN{PK}, User_ID{FK}, edition, year of publication, title)

book_copy (copy_number{PK}, ISBN{FK}, User_ID{FK}, no of copies, orderDate)

ACL_user (User_ID{PK}, address, full_name)

academic_journal (ISSN{PK}, subscription_cost, year_of_creation, description, publisher_name, publication_type)

article (DOI{PK}, ISSN{FK}, abstract, title)

authors (DOI{PK}, author{PK})

ace_journal_article(ISSN{PK}, issue_of_journal, volume)

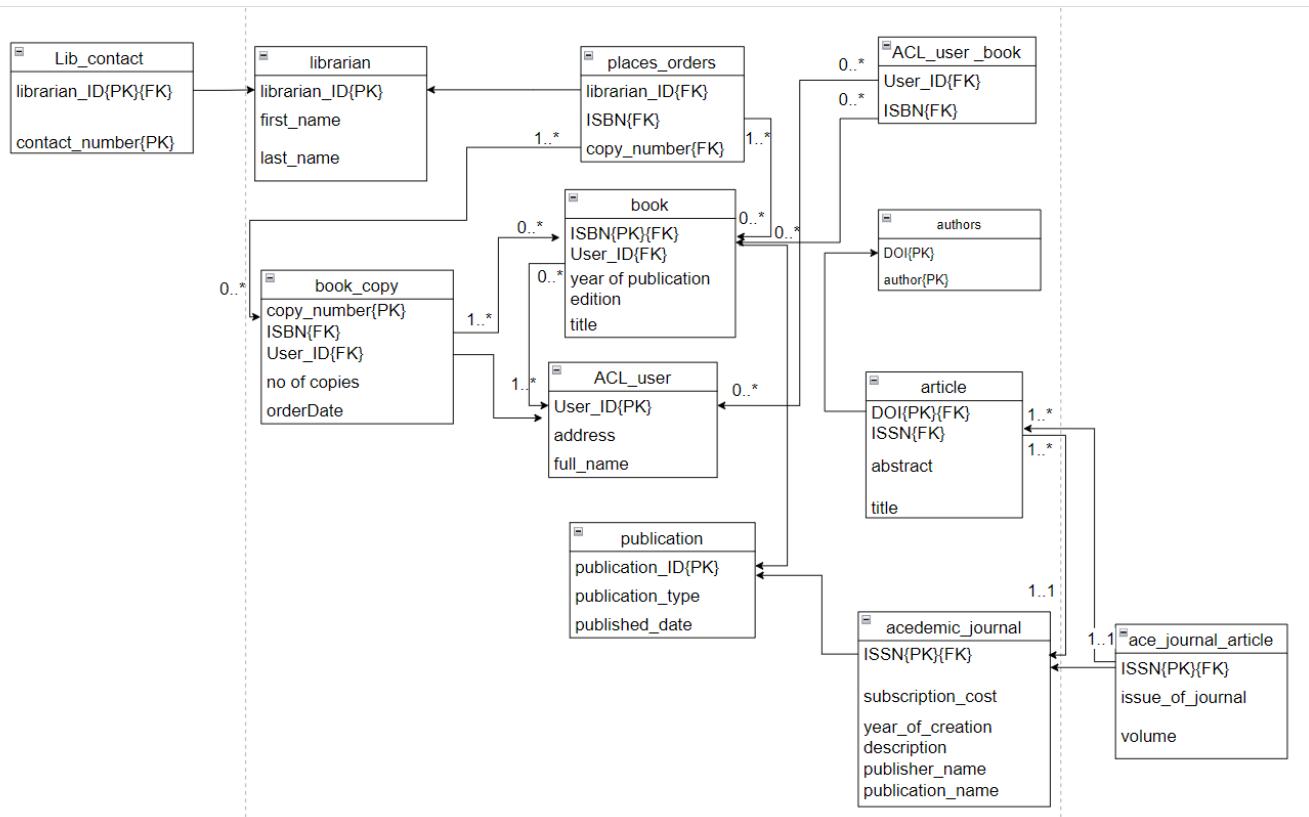
publication (publication_ID{PK}, publication_type, published_date)

ACL_user_book (User_ID{FK}, ISBN{FK})

`places_orders (librarian_ID{FK}, ISBN{FK}, copy_number{FK})`

- Since issue_of_journal and volume which are in article are from academic_journal(as mentioned in the scenario), it can have partial dependencies. Therefore, those two attributes are removed and included in a new relation to remove partial dependencies and to make it 2NF. The new table will be ace_journal_article with the primary ISSN. After creating the new table, it will be normalized to 2NF

Diagram of the Logical Schema



Assumptions

- A new relation was created as lib_contact after normalizing since it had multi-valued attributes (contact_number)
- A new relation was created as authors after normalizing since it had multi-valued attributes (author)
- Another new relation was created as ace_academic_journal since volume & issue of journal had partial dependencies in the articles relation

Question 3

Use proper SQL code to implement the relational schema in MySQL database. Each table should be consisted with a primary key and other relevant attribute. Appropriate foreign key constraints should be used. SQL code and generated table screenshots should be included in the report.

Query for table librarian

create table librarian

(

```
librarian_ID int(5)PRIMARY KEY,  
first_name varchar(15) not null,  
last_name varchar(15) not null
```

);

The screenshot shows the phpMyAdmin interface for the 'librarian' table. The table has three columns: 'librarian_ID', 'first_name', and 'last_name'. The data consists of five rows:

librarian_ID	first_name	last_name
11	Ann	Fernando
12	William	Fernando
13	Sanduhike	De Alwis
14	Chryshall	Fonseka
15	Imaya	Pereira

Query for table lib_contact

create table lib_contact

(

```
librarian_ID int(5)PRIMARY KEY,  
contact_number varchar(10) not null
```

);

The screenshot shows the phpMyAdmin interface for the 'lib_contact' table. The table has two columns: 'librarian_ID' and 'contact_number'. The data consists of five rows:

librarian_ID	contact_number
11	71958038
12	779812355
13	777234698
14	712047983
15	713685857

Query for table ACL_user

create table ACL_user

(

User_ID int(6)PRIMARY KEY,
address varchar(100),
name varchar(12) not null

);

The screenshot shows the phpMyAdmin interface for the 'ad' database. The left sidebar lists various tables, including 'ad', 'ad_user', 'book', 'book_copy', 'librarian', 'lib_contact', 'places_orders', 'publication', and 'ace_journal_article'. The 'acl_user' table is selected in the main area. The table structure is displayed with columns: User_ID (Primary Key), address, and name. There are 5 rows of data listed:

User_ID	address	name
111	711-2880 Nulla St.Mankato Mississippi 06522	Anal Perera
112	P.O. Box 283 8562 Funze Rd.Frederick Nebraska 2002	Iris Watson
113	606-3727 Ultamcorper Street Roseville NH 11523	Theodore Low
114	Ap #667-859 Sitr Rd.Azusa New York 39531	Emmy Rose
115	7292 Dictum Av.San Antonio MI 47096711-2880 Nulla ...	Sudan Perera

Query for table publication

create table publication

(

publication_ID int(6)PRIMARY KEY,
publication_type varchar(15)not null,
published_date date

);

The screenshot shows the phpMyAdmin interface for the 'ad' database. The left sidebar lists various tables, including 'ad', 'ad_user', 'book', 'book_copy', 'librarian', 'lib_contact', 'places_orders', 'publication', and 'ace_journal_article'. The 'publication' table is selected in the main area. The table structure is displayed with columns: publication_ID (Primary Key), publication_type, and published_date. There are 6 rows of data listed:

publication_ID	publication_type	published_date
49223	journal	1998-04-26
49453	journal	1999-03-21
49712	Journal	1995-01-31
49806	academic_book	2005-15-14
49896	academic_book	2003-05-05

Query for table ace_journal_article

CREATE TABLE ace_journal_article

(

ISSN int(6)PRIMARY KEY,
issue_of_journal date,
volume int(2)not null

);

The screenshot shows the phpMyAdmin interface for the 'ad' database. The left sidebar lists various tables, including 'ad', 'ad_user', 'book', 'book_copy', 'librarian', 'lib_contact', 'places_orders', 'publication', and 'ace_journal_article'. The 'ace_journal_article' table is selected in the main area. The table structure is displayed with columns: ISSN (Primary Key), issue_of_journal, and volume. There are 5 rows of data listed:

ISSN	issue_of_journal	volume
28197	2007-11-11	55
25231	2007-12-12	72
28258	2015-08-17	15
28533	2004-02-20	41
28742	2003-01-19	25

Query for table authors

CREATE TABLE authors

(

DOI int(5)PRIMARY KEY,

author varchar(20) not null

);

The screenshot shows the phpMyAdmin interface for the 'authors' table. The left sidebar lists various databases and schemas. The main area shows the table structure with columns: DOI (Primary Key), author, and a data grid containing five rows of data. The data grid includes columns for Edit, Copy, Delete, and other options.

DOI	author
10011	William Shakespeare
10012	William Faulkner
10013	Henry James
10014	Jane Austen
10015	Charles Dickens

Query for table article

CREATE TABLE article

(

DOI int(5)PRIMARY KEY,

ISSN int(5)not null,

abstract varchar(50),

title varchar(45),

FOREIGN KEY (ISSN) REFERENCES academic_journal(ISSN)

);

The screenshot shows the phpMyAdmin interface for the 'article' table. The left sidebar lists various databases and schemas. The main area shows the table structure with columns: DOI (Primary Key), ISSN, abstract, and title. The data grid contains four rows of data. The data grid includes columns for Edit, Copy, Delete, and other options.

DOI	ISSN	abstract	title
10011	28251	This briefing sets the stage for COP26 from the pe...	Resetting climate negotiations
10012	28530	The international efforts to address the climate c...	The Impacts of COVID-19
10013	28742	Climate change has global impacts, but this year a...	climate change
10014	28259	Global climate resilience is a matter of life and...	Diversification for climate resilience
10015	28197	In Uganda, many people illegally hunt, traffic or...	Improving community attitudes

Query for table academic_journal

CREATE TABLE academic_journal

(

ISSN int(6)PRIMARY KEY,

subscription_cost decimal(6,2)not null,

year_of_creation date,

description varchar(150),

publisher_name varchar(20)not null,

publication_name varchar(30)

);

The screenshot shows the phpMyAdmin interface for the 'academic_journal' table. The left sidebar lists various databases and schemas. The main area shows the table structure with columns: ISSN (Primary Key), subscription_cost, year_of_creation, description, publisher_name, and publication_name. The data grid contains six rows of data. The data grid includes columns for Edit, Copy, Delete, and other options.

ISSN	subscription_cost	year_of_creation	description	publisher_name	publication_name
28197	4000.00	2001-05-29	They do not cover original research but instead ac...	"Yevgeny Zhdanov"	"A TIME TO KILL"
28221	3000.00	2009-07-23	The short descriptions of important latest study o...	"Ernest Hemingway"	"The Devil Wears Prada"
28528	2800.00	2008-11-02	These mostly consist of large-volume tabular data ...	"Agatha Christie"	"Catcher in the Rye"
28539	1000.00	2013-04-11	These are the short descriptions which are consider...	"Barbara Cartland"	"The Wisdom"
28742	5000.00	2006-06-30	These are usually around 5-20 pages and are complete...	"Franz Kafka"	"Don Quixote"

Query for table book

CREATE TABLE book

(

ISBN int(5)PRIMARY KEY,

User_ID int(5)not null,

edition varchar(12) not null,

year_of_publication date,

title varchar(25)not null,

FOREIGN KEY (User_ID) REFERENCES acl_user(User_ID)

);

The screenshot shows the phpMyAdmin interface for the 'book' table. The left sidebar lists various databases and tables, including 'book'. The main area displays the table structure with columns: ISBN, User_ID, edition, year_of_publication, and title. Below the structure, there is a list of four rows of data:

	ISBN	User_ID	edition	year_of_publication	title
<input type="checkbox"/>	13087	113	1st edition	2000-04-26	ABSALOM, ABSALOM!
<input type="checkbox"/>	13089	111	1st edition	2000-08-27	THE HOUSE OF MIRTH
<input type="checkbox"/>	13226	112	2nd edition	1998-04-16	A TIME TO KILL
<input type="checkbox"/>	13528	114	3rd edition	2009-07-23	EAST OF EDEN
<input type="checkbox"/>	13916	115	1st edition	2014-02-18	THE SUN ALSO RISES

Query for table book_copy

CREATE TABLE book_copy

(

copy_number int(6)PRIMARY KEY,

ISBN int(5)not null,

User_ID int(5) not null,

no_of_copies int(100) not null,

orderDate date,

FOREIGN KEY (ISBN) REFERENCES book(ISBN),

FOREIGN KEY (User_ID) REFERENCES acl_user(User_ID)

);

The screenshot shows the phpMyAdmin interface for the 'book_copy' table. The left sidebar lists various databases and tables, including 'book_copy'. The main area displays the table structure with columns: copy_number, ISBN, User_ID, no_of_copies, and orderDate. Below the structure, there is a list of five rows of data:

	copy_number	ISBN	User_ID	no_of_copies	orderDate
<input type="checkbox"/>	12068	13087	111	6	2000-04-26
<input type="checkbox"/>	13642	13528	114	4	1998-01-08
<input type="checkbox"/>	13765	13226	112	5	2001-08-17
<input type="checkbox"/>	18245	13916	116	8	2002-02-26
<input type="checkbox"/>	19045	13087	113	2	2005-11-13

Query for table places_orders

CREATE TABLE places_orders

(

 librarian_ID int(6)not null,

 ISBN int(6)not null,

 copy_number int(10)not null,

 FOREIGN KEY(librarian_ID) REFERENCES librarian(librarian_ID),

 FOREIGN KEY(ISBN) REFERENCES book(ISBN),

 FOREIGN KEY(copy_number) REFERENCES book_copy(copy_number)

);

The screenshot shows the phpMyAdmin interface for the 'places_orders' table. The left sidebar shows the database structure with various tables like 'ad', 'book', 'book_copy', etc. The main area displays the 'places_orders' table with the following data:

librarian_ID	ISBN	copy_number
11	13200	12008
12	13226	13785
13	13087	19345
14	13028	13042
15	13916	18249

Query for table acl_user_book

CREATE TABLE acl_user_book

(

 User_ID int(5) not null,

 ISBN int(5) not null,

 FOREIGN key (User_ID) REFERENCES acl_user(User_ID),

 FOREIGN key (ISBN) REFERENCES book(ISBN)

);

The screenshot shows the phpMyAdmin interface for the 'acl_user_book' table. The left sidebar shows the database structure with various tables like 'ad', 'book', 'book_copy', etc. The main area displays the 'acl_user_book' table with the following data:

User_ID	ISBN
111	13089
112	13226
113	13087
114	13028
115	13916

Question 4

Insert sample data to the created tables. Each table should be consisted with at least 5 sample data.

INSERT into lib_contact (librarian_ID, contact_number)

VALUES

```
(11, 0719586384),  
(12, 0779862355),  
(13, 0777234698),  
(14, 0712647983),  
(15, 0713698357);
```

The screenshot shows the phpMyAdmin interface for the 'acl' database. The left sidebar shows the database structure with tables like academic_journal, ace_journal_article, acl_user, article, authors, book, book_copy, librarian, lib_contact, places_orders, and publication. The 'lib_contact' table is selected in the main area. The table has two columns: 'librarian_ID' and 'contact_number'. Five rows have been inserted:

librarian_ID	contact_number
11	719586384
12	779862355
13	777234698
14	712647983
15	713698357

Below the table, there are buttons for operations like Print, Copy to clipboard, Export, Display chart, and Create view.

```
INSERT INTO librarian(library_ID, first_name, last_name)
VALUES
(11, "Ann", "Fernando"),
(12, "William", "Fernando"),
(13, "Sandushke", "De Alwis"),
(14, "Chryshall", "Fonseka"),
(15, "Imaya", "Perera);
```

The screenshot shows the phpMyAdmin interface for a MySQL database named 'acl'. The left sidebar displays a tree view of databases and tables, with 'librarian' selected. The main panel shows the results of a SELECT query on the 'librarian' table. The table has three columns: library_ID, first_name, and last_name. The data is as follows:

library_ID	first_name	last_name
11	Ann	Fernando
12	William	Fernando
13	Sandushke	De Alwis
14	Chryshall	Fonseka
15	Imaya	Perera

Below the table, there are buttons for 'Edit', 'Copy', and 'Delete' for each row. The bottom of the interface includes standard phpMyAdmin navigation and export options.

INSERT into publication(publication_ID, publication_type, published_date)

VALUES

```
(49223, "journal", "1998-04-26"),
(49896, "academic_book", "2003-05-05"),
(49453, "journal", "1999-03-21"),
(49836, "academic_book", "2005-10-14"),
(49712, "journal", "1995-01-31);
```

The screenshot shows the phpMyAdmin interface for a MySQL database named 'acl'. The left sidebar lists various schemas and tables, including 'publication' which is currently selected. The main area displays the 'publication' table with the following data:

	publication_ID	publication_type	published_date
<input type="checkbox"/>	49223	journal	1998-04-26
<input type="checkbox"/>	49453	journal	1999-03-21
<input type="checkbox"/>	49712	journal	1995-01-31
<input type="checkbox"/>	49836	academic_book	2005-10-14
<input type="checkbox"/>	49896	academic_book	2003-05-05

Below the table, there are buttons for 'Check all', 'With selected:', 'Edit', 'Copy', 'Delete', and 'Export'. The bottom section contains links for 'Print', 'Copy to clipboard', 'Export', 'Display chart', and 'Create view'.

```
INSERT into acl_user(User_ID, address, name)
```

VALUES

```
(111,"711-2880 Nulla St.Mankato Mississippi 96522", "Amal Perera"),  
(112, "P.O. Box 283 8562 Fusce Rd.Frederick Nebraska 20620", "Iris Watson"),  
(113, "606-3727 Ullamcorper.Street Roseville NH 11523","Theodore Low"),  
(114, "Ap #867-859 Sit Rd.Azusa New York 39531","Emmily Rose"),  
(115, "7292 Dictum Av.San Antonio MI 47096711-2880 Nulla St.Mankato Mississippi 96522", "Sadun  
Perera");
```

The screenshot shows the phpMyAdmin interface for the 'acl' database. The left sidebar shows the database structure with the 'acl' schema expanded, revealing tables like 'New', 'academic_journal', 'ace_journal_article', 'acl_user', 'acl_user_book', 'article', 'authors', 'book', 'book_copy', 'librarian', 'lib_contact', 'places_orders', and 'publication'. The 'information_schema' and system databases are also listed.

The main area displays the 'acl_user' table with the following data:

User_ID	address	name
111	711-2880 Nulla St.Mankato Mississippi 96522	Amal Perera
112	P.O. Box 283 8562 Fusce Rd.Frederick Nebraska 20620	Iris Watson
113	606-3727 Ullamcorper.Street Roseville NH 11523	Theodore Low
114	Ap #867-859 Sit Rd.Azusa New York 39531	Emmily Rose
115	7292 Dictum Av.San Antonio MI 47096711-2880 Nulla St.Mankato Mississippi 96522	Sadun Perera

Below the table, there are buttons for 'Check all', 'With selected:', and various operations like Edit, Copy, Delete, and Export. There are also links for 'Query results operations' such as Print, Copy to clipboard, Export, Display chart, and Create view.

```
INSERT INTO academic_journal(ISSN, subscription_cost, year_of_creation, description, publisher_name, publication_name)
```

VALUES

(28231, 3000, "2009-07-23", "The short descriptions of important latest study or research findings which are usually considered urgent for immediate publication", "Ernest Hemingway", "The Devil Wears Prada"),

(28539, 1500, "2013-04-11", "These are the short descriptions which are considered less urgent compared to Letters.", "Barbara Cartland", "The Wisdom"),

(28742, 5000, "2006-06-30", "These are usually around 5-20 pages and are complete descriptions of current original research findings.", "Franz Kafka", "Don Quixote"),

(28258, 2500, "2008-11-02", "These mostly consist of large-volume tabular data that details all the results of current research.", "Agatha Christie", "Catcher in the Rye"),

(28197, 4000, "2001-05-29", "They do not cover original research but instead accumulate results of multiple articles about the state of the art in the said field.", "Fyodor Dostoevsky", "A TIME TO KILL");

The screenshot shows the phpMyAdmin interface for the 'academic_journal' table in the 'acl' database. The table structure includes columns: ISSN, subscription_cost, year_of_creation, description, publisher_name, and publication_name. The data is as follows:

	ISSN	subscription_cost	year_of_creation	description	publisher_name	publication_name
<input type="checkbox"/>	28197	4000.00	2001-05-29	They do not cover original research but instead ac...	"Fyodor Dostoevsky"	"A TIME TO KILL"
<input type="checkbox"/>	28231	3000.00	2009-07-23	The short descriptions of important latest study o...	"Ernest Hemingway"	"The Devil Wears Prada"
<input type="checkbox"/>	28258	2500.00	2008-11-02	These mostly consist of large-volume tabular data ...	"Agatha Christie"	"Catcher in the Rye"
<input type="checkbox"/>	28539	1500.00	2013-04-11	These are the short descriptions which are consider...	"Barbara Cartland"	"The Wisdom"
<input type="checkbox"/>	28742	5000.00	2006-06-30	These are usually around 5-20 pages and are comple...	"Franz Kafka"	"Don Quixote"

INSERT into book(ISBN, User_ID, edition, year_of_publication, title)

VALUES

(13089, 111, "1st edition", "2015-05-05", "THE HOUSE OF MIRTH"),
(13226, 112, "2nd edition", "1998-04-16", "A TIME TO KILL"),
(13087, 113, "1st edition", "2010-08-30", "ABSALOM, ABSALOM!"),
(13528, 114, "3rd edition", "2009-07-23", "EAST OF EDEN"),
(13916, 115, "1st edition", "2014-02-18", "THE SUN ALSO RISES");

The screenshot shows the phpMyAdmin interface for a MySQL database named 'acl'. The left sidebar lists various tables, and the 'book' table is selected. The main area displays the contents of the 'book' table:

	ISBN	User_ID	edition	year_of_publication	title
<input type="checkbox"/>	13087	113	1st edition	2000-04-26	ABSALOM, ABSALOM!
<input type="checkbox"/>	13089	111	1st edition	2000-08-27	THE HOUSE OF MIRTH
<input type="checkbox"/>	13226	112	2nd edition	1998-04-16	A TIME TO KILL
<input type="checkbox"/>	13528	114	3rd edition	2009-07-23	EAST OF EDEN
<input type="checkbox"/>	13916	115	1st edition	2014-02-18	THE SUN ALSO RISES

Below the table, there are buttons for 'Check all', 'With selected:', 'Edit', 'Copy', 'Delete', and 'Export'. The bottom navigation bar includes 'Console' and other standard phpMyAdmin links.

```

INSERT INTO book_copy(copy_number, ISBN, User_ID, no_of_copies, orderDate)
VALUES
(12908, 13089, 111, 6, "2000-03-26"),
(13785, 13226, 112, 5, "1999-01-08"),
(19345, 13087, 113, 2, "2001-08-17"),
(13642, 13528, 114, 4, "2002-02-25"),
(18245, 13916, 115, 8, "2005-11-13");

```

The screenshot shows the phpMyAdmin interface for the 'book_copy' table in the 'acl' database. The table structure is displayed with columns: copy_number, ISBN, User_ID, no_of_copies, and orderDate. The data grid shows the following rows:

	copy_number	ISBN	User_ID	no_of_copies	orderDate
<input type="checkbox"/>	12908	13089	111	6	2000-03-26
<input type="checkbox"/>	13642	13528	114	4	1999-01-08
<input type="checkbox"/>	13785	13226	112	5	2001-08-17
<input type="checkbox"/>	18245	13916	115	8	2002-02-25
<input type="checkbox"/>	19345	13087	113	2	2005-11-13

Below the table, there are buttons for 'Check all', 'With selected:', and various operations like Edit, Copy, Delete, and Export.

```
INSERT INTO places_orders(librarian_ID, ISBN, copy_number)  
VALUES  
(11, 13089, 12908),  
(12, 13226, 13785),  
(13, 13087, 19345),  
(14, 13528, 13642),  
(15, 13916, 18245);
```

The screenshot shows the phpMyAdmin interface for a MySQL database named 'acl'. The left sidebar lists various schemas and tables. The 'places_orders' table is selected, showing the following data:

librarian_ID	ISBN	copy_number
11	13089	12908
12	13226	13785
13	13087	19345
14	13528	13642
15	13916	18245

The SQL query used to retrieve this data is:

```
SELECT * FROM `places_orders`
```

Below the table, there are several operation buttons: Print, Copy to clipboard, Export, Display chart, Create view, and a Console button.

```

INSERT INTO ace_journal_article(ISSN, issue_of_journal, volume)
VALUES
(28231, "2007-12-12", 72),
(28539, "2004-02-20", 41),
(28742, "2000-01-19", 25),
(28258, "2015-08-17", 15),
(28197, "2007-11-11", 55);

```

The screenshot shows the phpMyAdmin interface for the 'ace' database. The left sidebar lists various tables: New, acl, academic_journal, ace_journal_article (which is selected), acl_user, acl_user_book, article, authors, book, book_copy, librarian, lib_contact, places_orders, publication, information_schema, lecture8, mysql, performance_schema, phpmyadmin, test, and tutorial8. The main area displays the 'ace_journal_article' table with the following data:

	ISSN	issue_of_journal	volume
<input type="checkbox"/>	28197	2007-11-11	55
<input type="checkbox"/>	28231	2007-12-12	72
<input type="checkbox"/>	28258	2015-08-17	15
<input type="checkbox"/>	28539	2004-02-20	41
<input type="checkbox"/>	28742	2000-01-19	25

Below the table, there are buttons for 'Check all', 'With selected:', and 'Export'. At the bottom, there are links for 'Print', 'Copy to clipboard', 'Export', 'Display chart', and 'Create view'.

INSERT INTO article(DOI, ISSN, abstract, title)

VALUES

(10011, 28231, "This briefing sets the stage for COP26 from the perspective of LDCs", "Resetting climate negotiations"),

(10012, 28539, "The international efforts to address the climate crisis in 2020 were among the myriad processes affected by COVID-19", "The impacts of COVID-19"),

(10013, 28742, "Climate change has global impacts, but hits poor and vulnerable communities first and worst", "climate change"),

(10014, 28258, "Global climate resilience is a matter of life and death", "Diversification for climate resilience"),

(10015, 28197, "In Uganda, many people illegally hunt, traffic or trade wildlife because other opportunities to earn money are limited", "Improving community attitudes");

The screenshot shows the phpMyAdmin interface for the 'acl' database. The left sidebar lists various databases and tables. The main area is titled 'Table: article'. A green bar at the top indicates 'Showing rows 0 - 4 (5 total, Query took 0.0005 seconds.)'. Below it, a SQL query 'SELECT * FROM `article`' is shown. The table structure has columns 'DOI', 'ISSN', 'abstract', and 'title'. Each row includes edit, copy, delete, and checkmark links. The data is as follows:

	DOI	ISSN	abstract	title	
<input type="checkbox"/>	Edit	Copy	Delete	10011 28231 This briefing sets the stage for COP26 from the pe	Resetting climate negotiations
<input type="checkbox"/>	Edit	Copy	Delete	10012 28539 The international efforts to address the climate c	The impacts of COVID-19
<input type="checkbox"/>	Edit	Copy	Delete	10013 28742 Climate change has global impacts, but hits poor a	climate change
<input type="checkbox"/>	Edit	Copy	Delete	10014 28258 Global climate resilience is a matter of life and	Diversification for climate resilience
<input type="checkbox"/>	Edit	Copy	Delete	10015 28197 In Uganda, many people illegally hunt, traffic or	Improving community attitudes

Below the table, there are buttons for 'Check all', 'With selected:', and 'Edit'. At the bottom, there are links for 'Print', 'Copy to clipboard', 'Export', 'Display chart', and 'Create view'.

INSERT into authors(DOI, author)

VALUES

```
(10011, "William Shakespeare"),
(10012, "William Faulkner"),
(10013, "Henry James"),
(10014, "Jane Austen"),
(10015, "Charles Dickens");
```

The screenshot shows the phpMyAdmin interface for a MySQL database named 'acl'. The left sidebar displays a tree view of databases and tables, with 'authors' selected. The main area shows the 'Structure' tab for the 'authors' table, which has columns 'DOI' and 'author'. Below the table definition, a list of 5 rows is shown:

	DOI	author
<input type="checkbox"/>	10011	William Shakespeare
<input type="checkbox"/>	10012	William Faulkner
<input type="checkbox"/>	10013	Henry James
<input type="checkbox"/>	10014	Jane Austen
<input type="checkbox"/>	10015	Charles Dickens

Below the table, there are buttons for 'Check all', 'With selected:', and various operations like 'Edit', 'Copy', and 'Delete'. At the bottom, there are links for 'Print', 'Copy to clipboard', 'Export', 'Display chart', and 'Create view'.

INSERT into acl_user_book(User_ID, ISBN)

VALUES

(111, 13089),

(112, 13226),

(113, 13087),

(114, 13528),

(115, 13916);

The screenshot shows the phpMyAdmin interface for the 'acl' database. The left sidebar shows various tables like academic_journal, ace_journal_article, acl_user, and acl_user_book. The 'acl_user_book' table is selected. The main area displays the results of the query: 'Showing rows 0 - 4 (5 total, Query took 0.0005 seconds.)'. The results are presented in a table:

User_ID	ISBN
111	13089
112	13226
113	13087
114	13528
115	13916

Below the table, there are buttons for 'Print', 'Copy to clipboard', 'Export', 'Display chart', and 'Create view'.

Question 5

Perform the following questions with respective SQL codes and their output (code and output screenshots should be provided). Marking schema has been aligned with the respective sub questions.

(a)

Query:

```
SELECT title  
FROM book  
WHERE year_of_publication BETWEEN "2000-01-01" AND "2000-12-31";
```

The screenshot shows the phpMyAdmin interface. On the left, there's a tree view of databases and tables. The main area displays the results of the executed SQL query:

```
Showing rows 0 - 1 (2 total. Query took 0.0017 seconds.)  
SELECT title FROM book WHERE year_of_publication BETWEEN "2000-01-01" AND "2000-12-31";  
Profile [ Edit inline ] [ Edit ] [ Explain SQL ] [ Create PHP code ] [ Refresh ]
```

The results table shows two rows:

title
ABSLOM, ABSALOM!
THE HOUSE OF MIRTH

Below the table are various operations buttons like Edit, Copy, Delete, etc.

(b)

Query:

```
SELECT publisher_name, description  
FROM ace_journal  
WHERE ISSN = 28539;
```

The screenshot shows the phpMyAdmin interface. On the left, there's a tree view of databases and tables under the 'New' database. The 'ace' database is expanded, showing 'New', 'New', 'academic_journal', 'ace_journal_article', 'ace_user', 'ace_user_book', 'article', 'authors', 'book', 'book_copy', 'librarian', 'lib_contact', 'places_orders', and 'publication'. The 'academic_journal' table is selected. The main area shows the results of the executed SQL query:

```
Showing rows 0 - 0 (1 total). Query took 0.0003 seconds.  
SELECT publisher_name, description FROM academic_journal WHERE ISSN = 28539;  
Profiling [Edit inline] [Edit] [Explain SQL] [Create PHP code] [Refresh]  
Show all | Number of rows: 25 Filter rows: Search this table  
+ Options  
publisher_name description  
Edit Copy Delete "Barbara Cartland" These are the short descriptions which are consider...  
Check all With selected: Edit Copy Delete Export  
Show all | Number of rows: 25 Filter rows: Search this table  
Query results operations  
Print Copy to clipboard Export Display chart Create view  
Console
```

The results table shows one row with the publisher name 'Barbara Cartland' and the description 'These are the short descriptions which are consider...'. There are buttons for editing, copying, deleting, and exporting the data.

(c)

Query:

```
SELECT DISTINCT title FROM book JOIN acl_user JOIN places_orders JOIN book_copy  
ON book.ISBN=book_copy.ISBN AND acl_user.User_ID=book_copy.User_ID  
WHERE name = "Amal Perera";
```

The screenshot shows the phpMyAdmin interface with the following details:

- Server:** 127.0.0.1 > Database: ac1 > Table: book
- Toolbar:** Browse, Structure, SQL, Search, Insert, Export, Import, Privileges, Operations, Triggers.
- Message Bar:** Current selection does not contain a unique column. Grid edit, checkbox, Edit, Copy and Delete features are not available.
- Result Area:** Shows the query result:

```
Showing rows 0 - 0 (1 total, Query took 0.0014 seconds.)  
SELECT DISTINCT title FROM book JOIN acl_user JOIN places_orders JOIN book_copy ON book.ISBN=book_copy.ISBN AND acl_user.User_ID=book_copy.User_ID WHERE name = "Amal Perera";
```
- Table View:** A single row is displayed with the title "THE HOUSE OF MIRTH".
- Operations:** Options to Show all, Number of rows (set to 25), Filter rows, and Search this table.
- Query Results Operations:** Buttons for Print, Copy to clipboard, Export, Display chart, and Create view.
- Console:** A small section at the bottom left.

(d)

Query:

```
SELECT places_orders.librarian_ID, SUM(no_of_copies) AS total_book_copies  
FROM book_copy JOIN librarian JOIN places_orders  
ON librarian.librarian_ID=places_orders.librarian_ID  
WHERE librarian.first_name="Ann" AND librarian.last_name="Fernando" AND orderDate<="2000-04-20";
```

The screenshot shows the phpMyAdmin interface with the following details:

- Server:** 127.0.0.1
- Database:** acl
- Table:** places_orders
- Browsing Options:** Browse, Structure, SQL, Search, Insert, Export, Import, Privileges, Operations, Triggers.
- Message Bar:** "Current selection does not contain a unique column. Grid edit, checkbox, Edit, Copy and Delete features are not available." (with a help icon).
- Query Result Message:** "Showing rows 0 - 0 (1 total, Query took 0.0017 seconds.)"
- SQL Query:** `SELECT places_orders.librarian_ID, SUM(no_of_copies) AS total_book_copies FROM book_copy JOIN librarian JOIN places_orders ON librarian.librarian_ID=places_orders.librarian_ID WHERE librarian.first_name="Ann" AND librarian.last_name="Fernando" AND orderDate<="2000-04-20";`
- Table Data:** A table with two rows showing the results of the query.

librarian_ID	total_book_copies
11	10
- Operations:** Print, Copy to clipboard, Export, Display chart, Create view.
- Console:** A text input field for running additional commands.