Experiment No 02: Create Database schema for given application

I. Practical Significance: A database is an organized collection of data. Databases are used to store, manage, and access all kinds of data. Database keeps information about people, places, or things, making it easy to look at and analyze. A Table in a database consists of columns and rows. Giving a table a primary key means choosing one special piece of information, like an enrolment number, to make sure every record on the table is unique and easy to find. This practical allows students to create database schema for a given application.

II. INDUSTRY / EMPLOYER EXPECTED OUTCOME:

To design database and use any RDBMS package as a backend for developing database applications.

III. COURSE LEVEL LEARNING OUTCOMES (COS): CO1 - Explain concept of database management system.

IV. LABORATORY LEARNING OUTCOME:

Create Database schema for given application.

V. Relevant Affective Domain related outcome(s)

1. Follow precautionary measures.
2. Follow installation steps.
3. Follow ethical practices.

VI. Relevant Theoretical Background

1. Create Database for Given Application:

- What is a Database?

A database is a collection of organized data that can be easily accessed, managed, and updated. Databases are created to store and manage data for an application, like keeping track of us information for a website.

Syntax:

CREATE DATABASE database_name;

Example:

create database employee;

2.Create Tables for the Given Application:

- What is a Table?

A table is a structure within a database that organizes data into rows and columns. It is used to store specific types of data, like user details or product information, in a structured way.

Syntax:

A basic command is

```
CREATE TABLE table_name (
column1 datatype,
column2 datatype,
...
);
```

Example :

```
create table emp (
empno  number(10),
ename varchar2(50),
sal number(6,2)
);
```

3. Assign Primary Key for Created Table:

- What is a Primary Key?

A primary key is a unique identifier for each record in a table. It ensures that each record can be uniquely identified and improves search speed.

Syntax:

```
CREATE TABLE table_name (
```

```
    column1 datatype PRIMARY KEY,
     column2 datatype,
     ...
    );
```

Example :

```
create table emp (
 empno  number(10) primary key,
 ename varchar2(50),
 sal number(6,2)
);
```

4. Modify the Table as per the Application Needs:

- Why Modify a Table?

To add, remove, or change columns based on new requirements or data types.

Syntax:

```
ALTER TABLE table_name ADD column_name datatype;
```

or removing a column:

```
ALTER TABLE table_name DROP COLUMN column_name;
```

Example:

```
alter table emp add mgr number (20);
```

or removing a column:

```
ALTER TABLE emp DROP COLUMN mgr;
```

VII. Required Resources/apparatus/equipment with specifications

Sr. No	Equipment Name with Broad Specifications	e Relevant LLO Number
1	Computer system with all necessary components like; motherboard, random access memory (RAM), read-only memory (ROM), internal hard disk drives, Mouse, Keyboard, and RDBMS applications such as Oracle Express Edition,MySql,SQLite,Oracle Live SQL etc.	All

VIII. Procedure

1. Create Database for given application
2. Create tables for the given application
3. Assign Primary key for created table
4. Modify the table as per the application needs.

IX. Result(s)

Hence we created Database schema for the given application

Untick

X. Practical related questions (Provide space for answers)

Note: Below are a few sample questions for reference. Teacher must design more suchquestions so as to ensure the achievement of identified CO.

1. Define Database and Database Management System
2. Describe primary key.
3. Draw E-R diagram for Library Management System.
4. Normalize the following table of EMP to 3NF

   EMP(empno,ename,mgr,job,deptno,loc,dname)

(Space for answer)

1] →

Database :

Database is an organised collection of data so that it can be easily accessed and managed.

Data base management :

Database management System is a Software which manages the data. It can perform various tasks like creation, retrival, to manage it in a systematic way

3] →

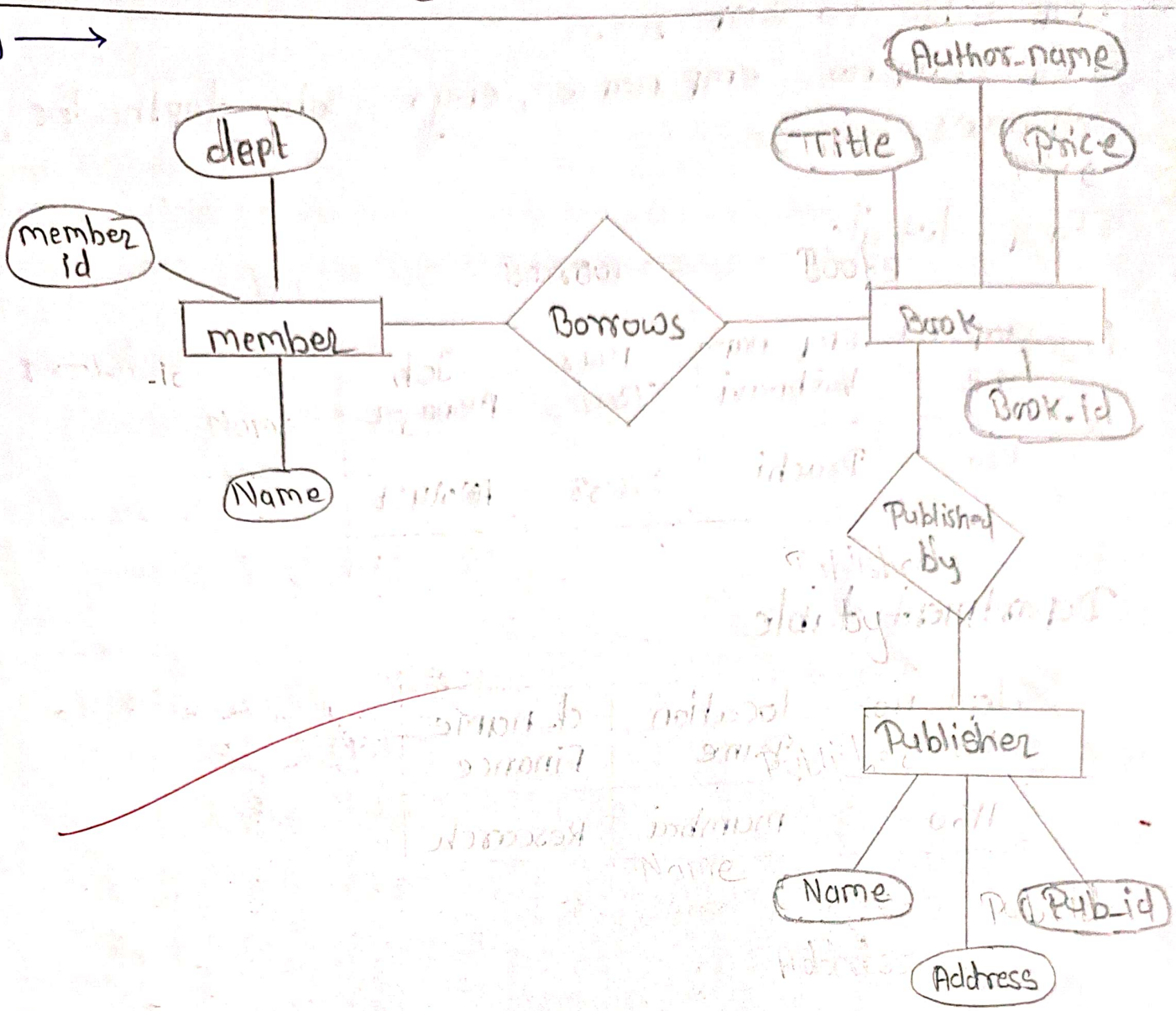

Figure
ER Diagram for Library management system

4] →

The 3NF (third Normal Form)
when a table in 2NF, it eliminates repeating groups and redundancy but it does not eliminate transitive partially dependency
This means a non-prime attribute can attribute that is not part of the candidates key is dependant on another non-prime attribute this is whant the third normal form (3NF) elimitinates.

Emp table to 3NF form

Emp (empno, emp name, engr, Job, deptho loc, dnames

Emp details

emp-no	emp-name	mgr	Job
152	Vaishnavi	7902	Manager
136	Prachi	7698	ANalyst

Department table

dept-no	location	d-name
1150	Pune	Finance
1160	mumbai	Research

Exercise

1] ⟶

Database:

It is an organised collection of data so that it can be easily accessed and managed.

Syntax:

```
CREATE DATABASE database_name;
```

Example:

```
create database emp;
```

2] ⟶

```
CREATE TABLE EMP (
  EMP_No int[4];
  Emp_Name Varchar[10];
  Emp_Job char(9);
  Emp_mgr int(4);
  Emp_hire_date time;
  Emp_Sal float,
  Comm float;
  dept_No int(2);
);
```

3] ⟶

To Alter the Emp table to assign the Emp_No Column as the primary key we use the command as given below

```
ALTER Table EMP;
ADD CONSTRAINT PRIMARY key;
PRIMARY key (EMP_No);
```

4] ⟶

```
CREATE TABLE DEPT (
  DEPT_no int[02];
  DEPT_name Varchar[10];
  DEPT_loc char[20];
);
```

as per requirement

2] →

A primary key is a column or a group of column in a table that uniquely identify tuple or record in relational table. Primary key cannot be null value and it must be unique for each tuple in relational table.

XI. Exercise

1. How would you create a new database named EMP?
2. Write the SQL commands to create the EMP table with the following structure:
   - empno as a number datatype with up to 4 digits
   - ename as a variable character datatype up to 10 characters
   - job as a variable character up to 9 characters
   - mgr as a number datatype with up to 4 digits
   - hiredate as a date
   - sal as a number with up to 7 digits, including 2 decimal places
   - comm as a number with up to 7 digits, including 2 decimal places
   - deptno as a number with up to 2 digits
3. How would you alter the EMP table to assign the empno column as the primary key?
4. Write the SQL commands to create the DEPT table with the following structure:
   - deptno as a number with up to 2 digits
   - dname as a variable character datatype up to 10 characters
   - loc as a variable character up to 20 characters

XII. References/Suggestions for further reading: include websites/links

1. http://vlabs.iitkgp.ernet.in/se/4/theory/
2. https://www.youtube.com/watch?v=yGU4YfSSjdM
3. https://blogs.oracle.com/sql/post/how-to-use-create-table-alter-table-and-drop-table-in-oracle-database