

# **Title:**

Online Teaching company  
Employee Information Management

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## **1. Description of Business System Summary:**

In today's world, there is a great importance for the web-based distance education system. Many online platforms have started after the pandemic for helping the students and learners. Here I am going to consider an online education platform which will be providing their technology for private and government institutions. The tutors will be hired by the company and classes will be provided through this online platform as per the requirements of the clients. The clients can be anyone among parents, students and institutions.

In this database, five entities are considered such as employees, department, project, salary and tutors. This study will be justifying how the data will be filtered, analysed and evaluated. As our clients are the one who request for the classes, the tutors will be provided as per their requirements according to the experience and region.

This company have four main departments such as Technical, Academics, Sales and Digital Marketing. Technical department is for improving the teaching platform performance. Sales and Digital Marketing are for making a reach for the company in the current market. The main pillar of this company is the Academics department. Academic department will act as a medium between the client and the tutors. Many tutors are assigned to each employee in the academic team. They will be controlling and scheduling every one-hour study sessions.

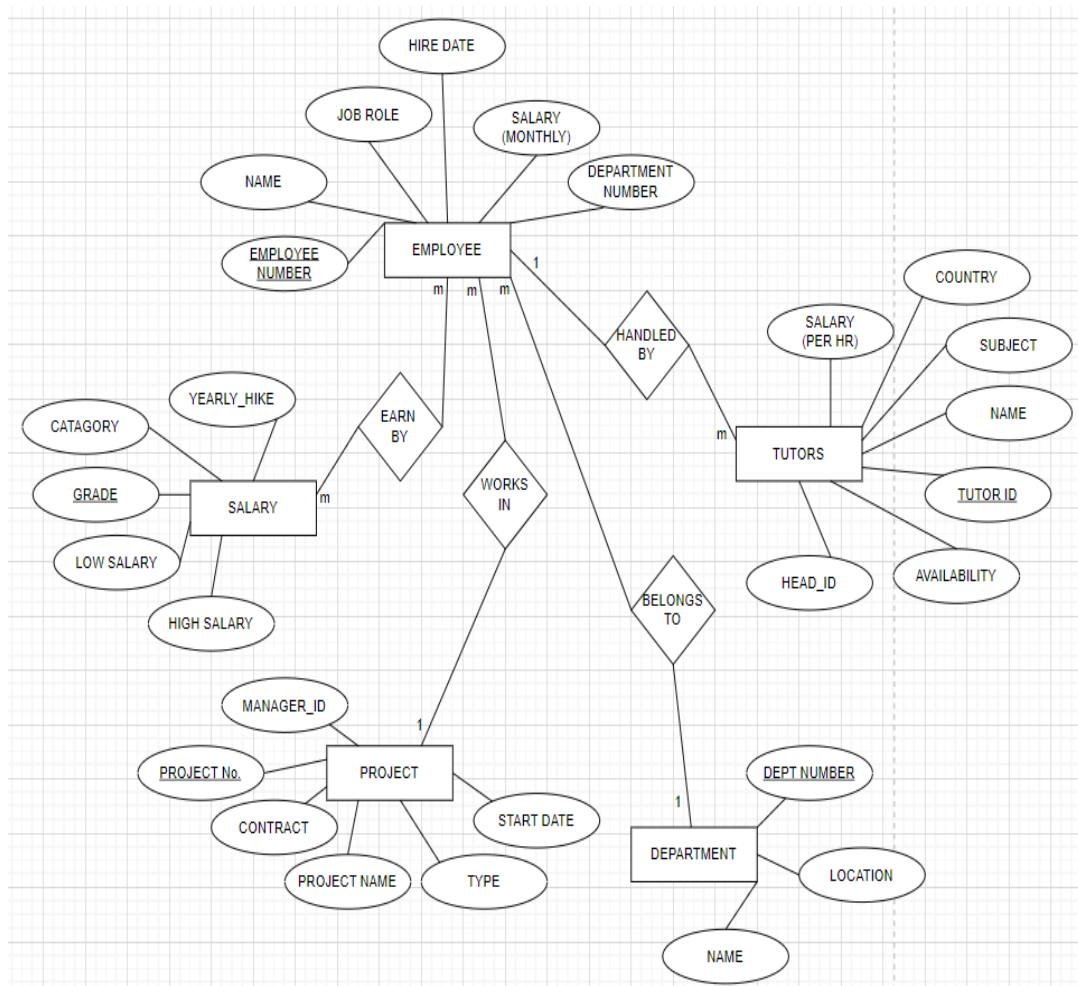
In this study, a database model is designed and developed to be used for the Employee Information Management. This developed model has a portable and easy to manage structure.

## 2. Schema Representation:

Here draw.io is the platform used for making the logical and physical schema.

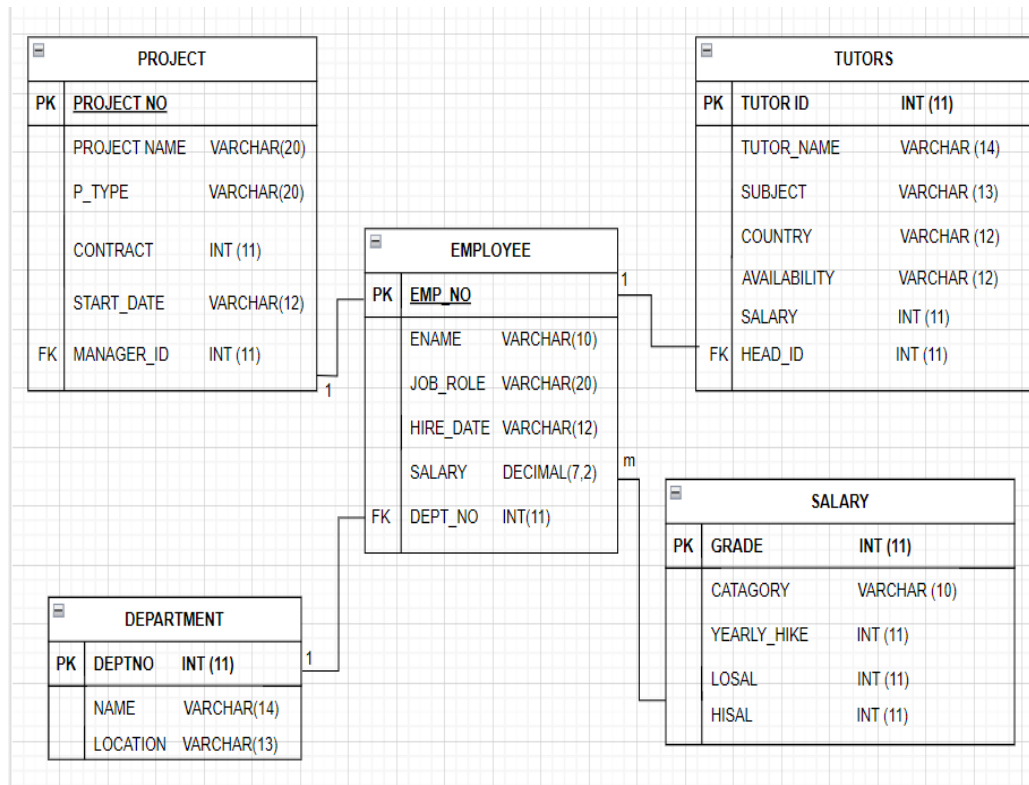
### 2.1 Logical Schema

In this database model, there are five entities and several attributes for each entity. Each entity will be having a relation with each other.



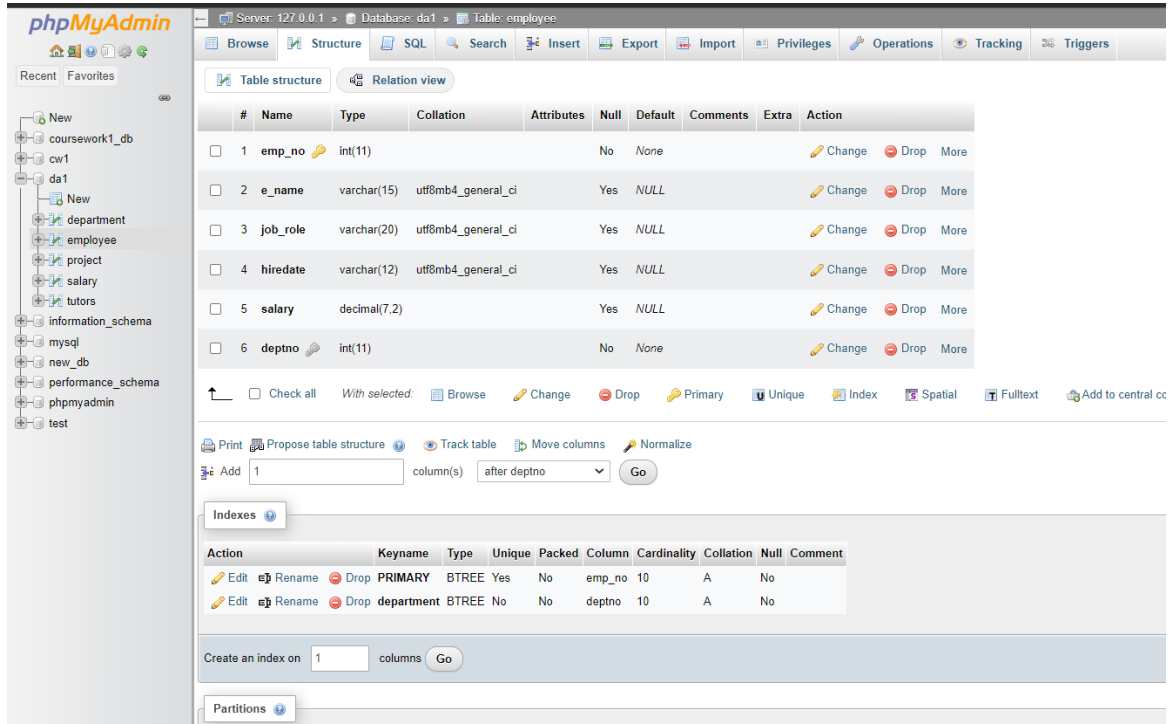
## 2.2 Physical Schema

This is the physical schema of the designed database.



### 3. Representation of Tables from the Server:

#### Structural Representation of “Employee” table:

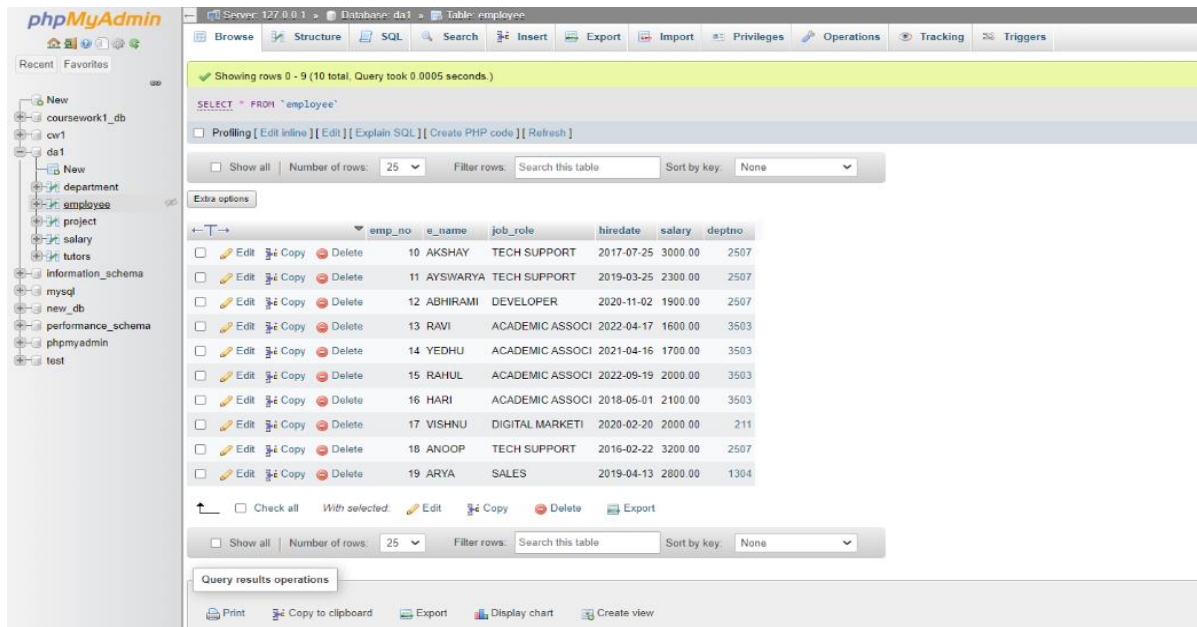


The screenshot shows the phpMyAdmin interface for the 'employee' table. The 'Table structure' tab is active, displaying the table's schema. The table has six columns: emp\_no, e\_name, job\_role, hiredate, salary, and deptno. The 'Indexes' section shows a PRIMARY index on emp\_no and a BTREE index on deptno.

#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra	Action
1	emp_no	int(11)			No	None			Change Drop More
2	e_name	varchar(15)	utf8mb4_general_ci		Yes	NULL			Change Drop More
3	job_role	varchar(20)	utf8mb4_general_ci		Yes	NULL			Change Drop More
4	hiredate	varchar(12)	utf8mb4_general_ci		Yes	NULL			Change Drop More
5	salary	decimal(7,2)			Yes	NULL			Change Drop More
6	deptno	int(11)			No	None			Change Drop More

Action	Keyname	Type	Unique	Packed	Column	Cardinality	Collation	Null	Comment
Edit Rename Drop	PRIMARY	BTREE	Yes	No	emp_no	10	A	No	
Edit Rename Drop	department	BTREE	No	No	deptno	10	A	No	

#### Representation of “Employee” table (with Data):

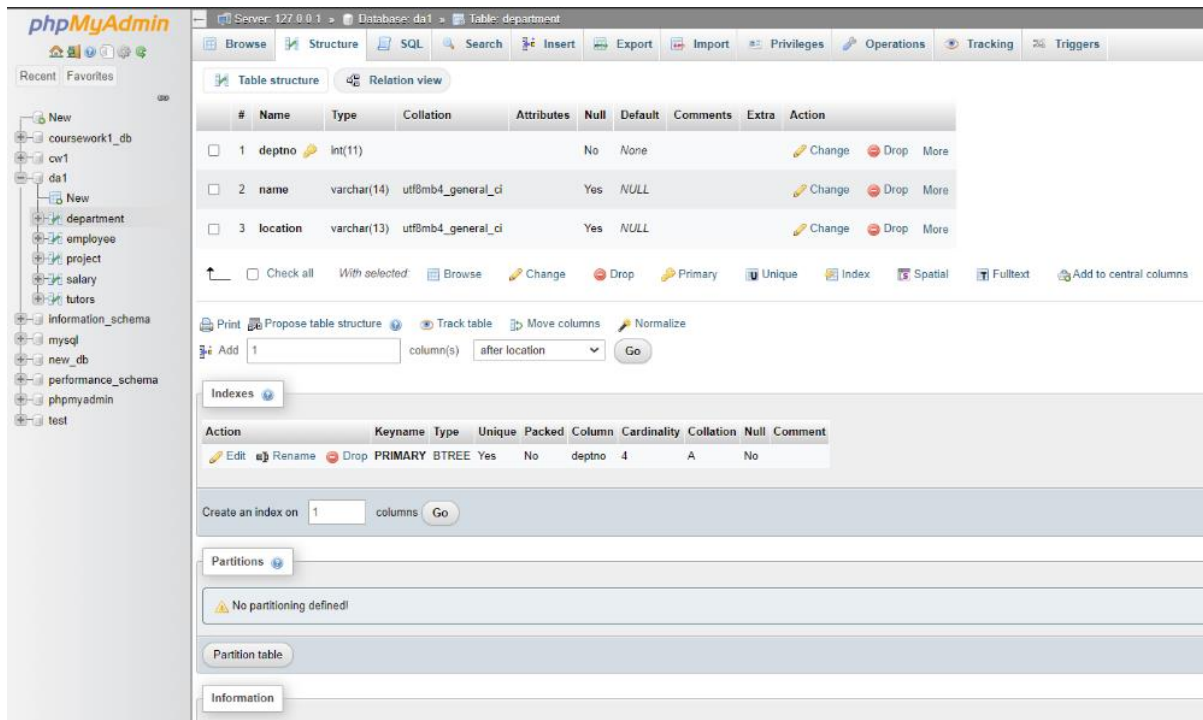


The screenshot shows the phpMyAdmin interface for the 'employee' table with the 'Data' tab active. It displays a list of 19 employees with their details. The 'Query results operations' section at the bottom provides options for printing, copying, exporting, displaying charts, and creating views.

	emp_no	e_name	job_role	hiredate	salary	deptno
<input type="checkbox"/> Edit <input type="checkbox"/> Copy <input type="checkbox"/> Delete	10	AKSHAY	TECH SUPPORT	2017-07-25	3000.00	2507
<input type="checkbox"/> Edit <input type="checkbox"/> Copy <input type="checkbox"/> Delete	11	AYSWARYA	TECH SUPPORT	2019-03-25	2300.00	2507
<input type="checkbox"/> Edit <input type="checkbox"/> Copy <input type="checkbox"/> Delete	12	ABHIRAMI	DEVELOPER	2020-11-02	1900.00	2507
<input type="checkbox"/> Edit <input type="checkbox"/> Copy <input type="checkbox"/> Delete	13	RAVI	ACADEMIC ASSOCI	2022-04-17	1600.00	3503
<input type="checkbox"/> Edit <input type="checkbox"/> Copy <input type="checkbox"/> Delete	14	YEDHU	ACADEMIC ASSOCI	2021-04-16	1700.00	3503
<input type="checkbox"/> Edit <input type="checkbox"/> Copy <input type="checkbox"/> Delete	15	RAHUL	ACADEMIC ASSOCI	2022-09-19	2000.00	3503
<input type="checkbox"/> Edit <input type="checkbox"/> Copy <input type="checkbox"/> Delete	16	HARI	ACADEMIC ASSOCI	2018-05-01	2100.00	3503
<input type="checkbox"/> Edit <input type="checkbox"/> Copy <input type="checkbox"/> Delete	17	VISHNU	DIGITAL MARKETI	2020-02-20	2000.00	211
<input type="checkbox"/> Edit <input type="checkbox"/> Copy <input type="checkbox"/> Delete	18	ANOOP	TECH SUPPORT	2016-02-22	3200.00	2507
<input type="checkbox"/> Edit <input type="checkbox"/> Copy <input type="checkbox"/> Delete	19	ARYA	SALES	2019-04-13	2800.00	1304

It represents the monthly salary in employee table.

## Structural Representation of “Department” table:

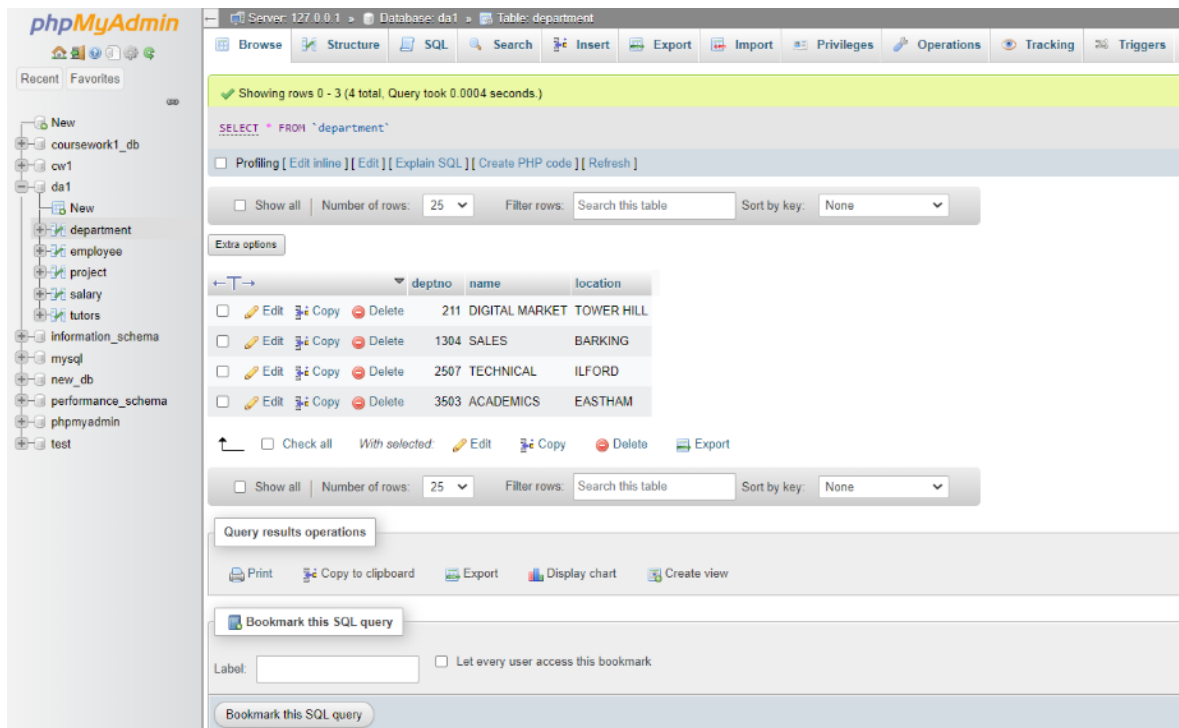


The screenshot shows the phpMyAdmin interface for the 'department' table. The table structure is as follows:

#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra	Action
1	deptno	int(11)			No	None			Change Drop More
2	name	varchar(14)	utf8mb4_general_ci		Yes	NULL			Change Drop More
3	location	varchar(13)	utf8mb4_general_ci		Yes	NULL			Change Drop More

The primary key is 'deptno'.

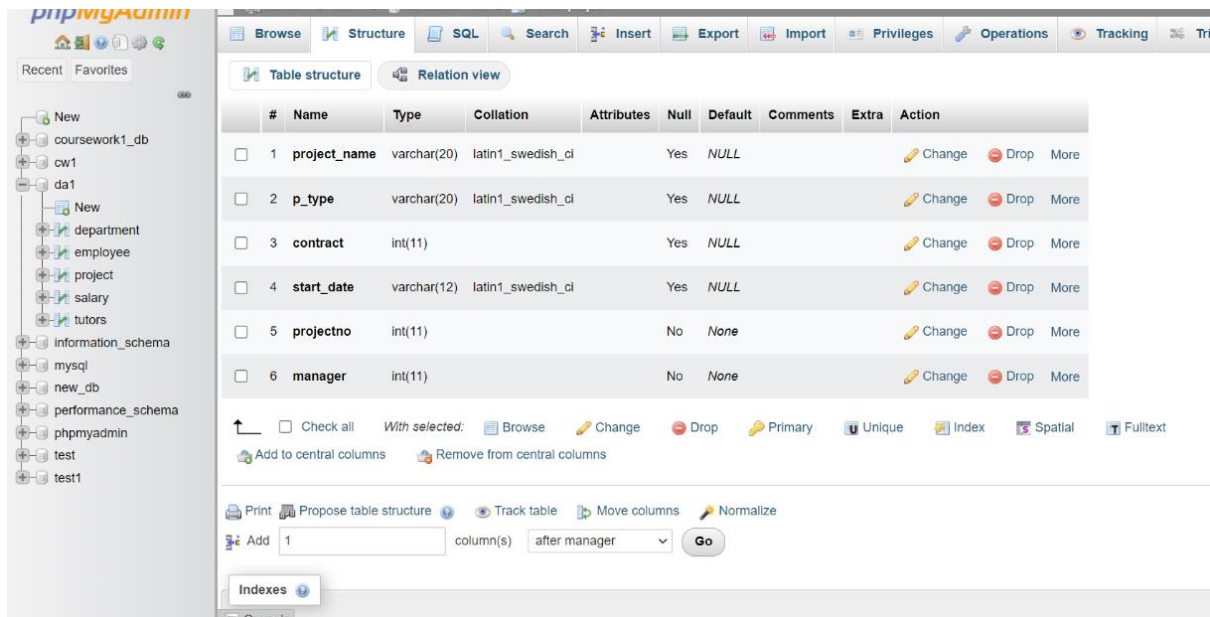
## Representation of “Department” table (with Data):



The screenshot shows the phpMyAdmin interface for the 'department' table with data. The data is as follows:

deptno	name	location
211	DIGITAL MARKET	TOWER HILL
1304	SALES	BARKING
2507	TECHNICAL	ILFORD
3503	ACADEMICS	EASTHAM

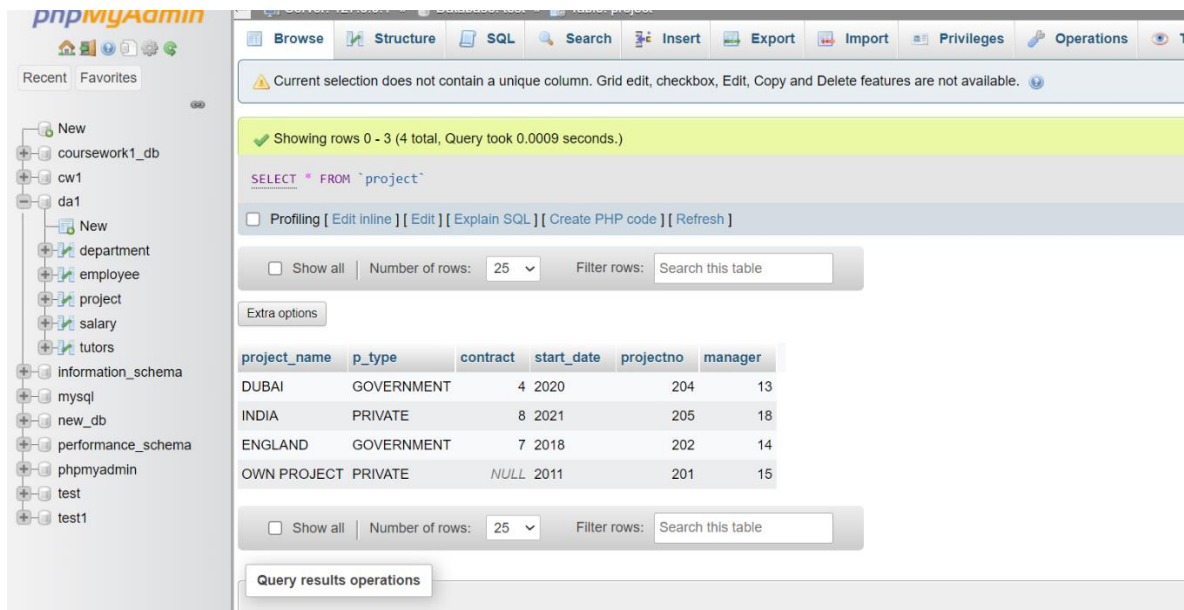
## Structural Representation of “Project” table:



The screenshot shows the phpMyAdmin interface with the 'Table structure' tab selected for the 'project' table. The table has 6 columns: project\_name, p\_type, contract, start\_date, projectno, and manager. The 'projectno' column is marked as the primary key.

#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra	Action
1	project_name	varchar(20)	latin1_swedish_ci		Yes	NULL			Change Drop More
2	p_type	varchar(20)	latin1_swedish_ci		Yes	NULL			Change Drop More
3	contract	int(11)			Yes	NULL			Change Drop More
4	start_date	varchar(12)	latin1_swedish_ci		Yes	NULL			Change Drop More
5	projectno	int(11)			No	None		Primary	Change Drop More
6	manager	int(11)			No	None			Change Drop More

## Representation of “Project” table (with Data):



The screenshot shows the phpMyAdmin interface with the 'SQL' tab selected. A query has been executed: `SELECT * FROM `project``. The results show 4 rows of data.

project_name	p_type	contract	start_date	projectno	manager
DUBAI	GOVERNMENT	4	2020	204	13
INDIA	PRIVATE	8	2021	205	18
ENGLAND	GOVERNMENT	7	2018	202	14
OWN PROJECT	PRIVATE	NULL	2011	201	15



## Structural Representation of “Salary” table:

The screenshot shows the phpMyAdmin interface for the 'salary' table. The table structure is as follows:

#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra	Action
1	grade	int(11)			No	None			Change Drop More
2	category	varchar(10)	utf8mb4_general_ci		Yes	NULL			Change Drop More
3	yearly_hike	int(11)			No	None			Change Drop More
4	losal	int(11)			No	None			Change Drop More
5	hisal	int(11)			No	None			Change Drop More

The primary key is 'grade'. The 'category' column is a foreign key to the 'category' column in the 'department' table. The 'yearly\_hike' column is a foreign key to the 'yearly\_hike' column in the 'employee' table. The 'losal' and 'hisal' columns are foreign keys to the 'losal' and 'hisal' columns in the 'information\_schema' table.

## Representation of “Salary” table (Populated with Data):

The screenshot shows the phpMyAdmin interface for the 'salary' table, displaying the data. The data is as follows:

grade	category	yearly_hike	losal	hisal
1	INTERN	200	1400	1899
2	LEVEL_1	340	1900	2399
3	LEVEL_2	400	2400	2799
4	LEVEL_3	570	2800	3199
5	LEVEL_4	620	3200	3600

## Structural Representation of “Tutors” table:

phpMyAdmin

Server: 127.0.0.1 » Database: da1 » Table: tutors

Table structure

#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra	Action
1	tutor_id	int(11)			No	None			Change Drop More
2	tutorname	varchar(14)	utf8mb4_general_ci		Yes	NULL			Change Drop More
3	subject	varchar(13)	utf8mb4_general_ci		Yes	NULL			Change Drop More
4	country	varchar(12)	utf8mb4_general_ci		No	None			Change Drop More
5	availability	varchar(12)	utf8mb4_general_ci		Yes	NULL			Change Drop More
6	salary	int(11)			Yes	NULL			Change Drop More
7	head	int(11)			No	None			Change Drop More

Indexes

Action	Keyname	Type	Unique	Packed	Column	Cardinality	Collation	Null	Comment
Edit Rename Drop	PRIMARY	BTREE	Yes	No	tutor_id	8	A	No	
Edit Rename Drop	head	BTREE	No	No	head	8	A	No	

## Representation of “Tutors” table (with Data):

phpMyAdmin

Server: 127.0.0.1 » Database: da1 » Table: tutors

Structure

Profiling [ Edit inline ] [ Edit ] [ Explain SQL ] [ Create PHP code ] [ Refresh ]

Show all | Number of rows: 25 | Filter rows: Search this table | Sort by key: None

Extra options

	tutor_id	tutorname	subject	country	availability	salary	head
<input type="checkbox"/> Edit Copy Delete	511	USHA	SCIENCE	DUBAI	WEEKDAYS	10	16
<input type="checkbox"/> Edit Copy Delete	512	SUNDHARI	MATHS	INDIA	WEEKDAYS	9	13
<input type="checkbox"/> Edit Copy Delete	517	BLAZKA	MATHS	UK	WEEKENDS	14	15
<input type="checkbox"/> Edit Copy Delete	518	NIKOLETT	ENGLISH	UK	WEEKDAYS	12	16
<input type="checkbox"/> Edit Copy Delete	521	REKHA	SCIENCE	UK	WEEKENDS	9	14
<input type="checkbox"/> Edit Copy Delete	523	LUCY	ENGLISH	UK	WEEKDAYS	13	15
<input type="checkbox"/> Edit Copy Delete	527	LEKHA	ENGLISH	INDIA	WEEKDAYS	11	14
<input type="checkbox"/> Edit Copy Delete	532	SUJATHA	ENGLISH	INDIA	WEEKENDS	11	13

Check all | With selected: Edit Copy Delete Export

Show all | Number of rows: 25 | Filter rows: Search this table | Sort by key: None

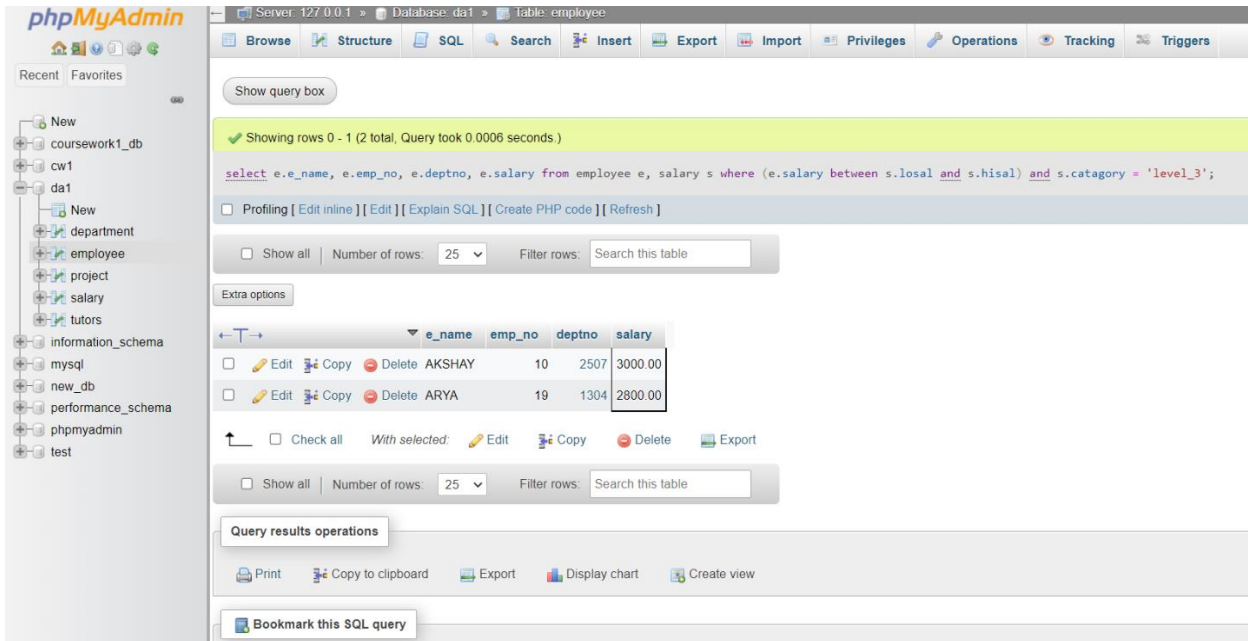
Query results operations

It represents the salary for an hour in tutors’ table.

## 4. Demonstration of Business Scenario and small Analysis:

### DQL:1

Find the name, employee number, department number and salary of Level 3 employees.



The screenshot shows the phpMyAdmin interface with the following details:

- Server:** 127.0.0.1
- Database:** da1
- Table:** employee
- Query:** `select e.e_name, e.emp_no, e.deptno, e.salary from employee e, salary s where (e.salary between s.losal and s.hisal) and s.catagory = 'level_3';`
- Results:** Showing rows 0 - 1 (2 total, Query took 0.0006 seconds.)
- Table Data:**

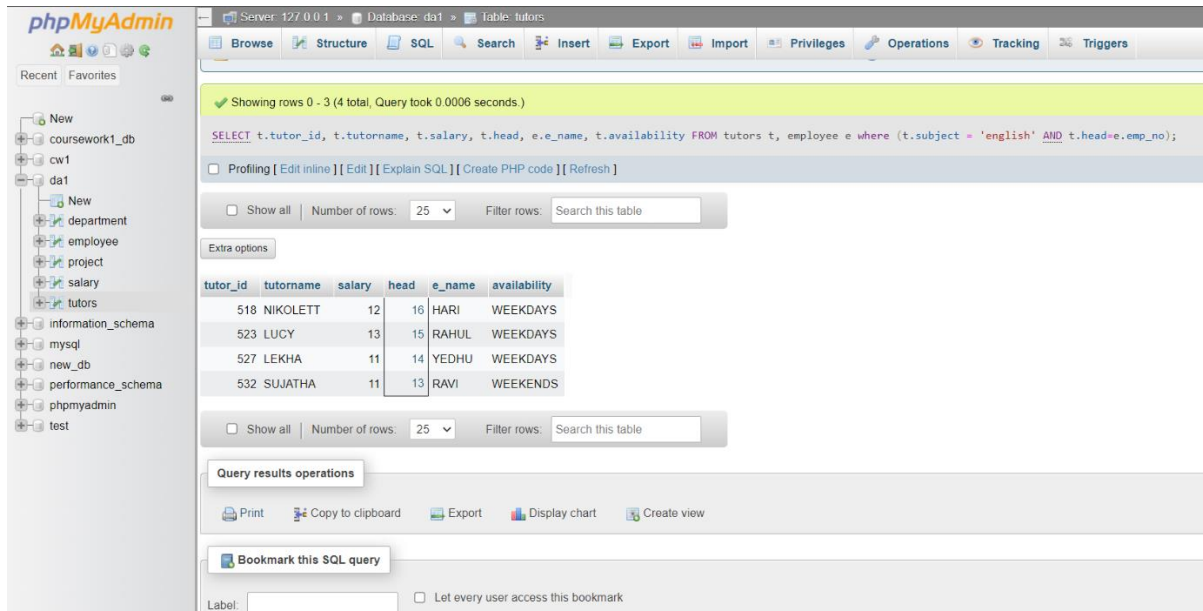
	e_name	emp_no	deptno	salary
<input type="checkbox"/>	AKSHAY	10	2507	3000.00
<input type="checkbox"/>	ARYA	19	1304	2800.00

### Justification of DQL:1

From the DQL operation generated above, the company can analyse and valueate the level of salary they are getting and the amount of contribution they are providing in their department. This analysis can help in maintaining the quality of work by each employee.

## DQL:2

Find the ID, name, salary and availability of the tutors who take English subject and their head employee's name and ID.



The screenshot shows the phpMyAdmin interface with the following details:

- Database:** da1
- Table:** tutors
- Query:** `SELECT t.tutor_id, t.tutorname, t.salary, t.head, e.e_name, t.availability FROM tutors t, employee e where (t.subject = 'english' AND t.head=e.emp_no);`
- Results:** Showing rows 0 - 3 (4 total). Query took 0.0006 seconds.
- Table Data:**

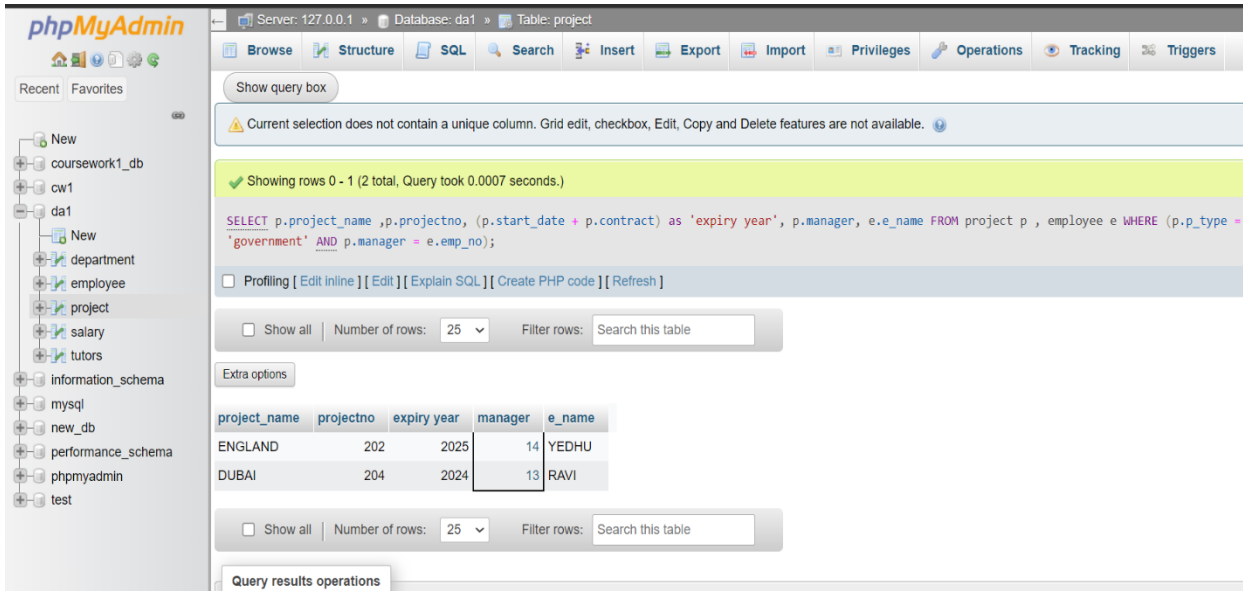
tutor_id	tutorname	salary	head	e_name	availability
518	NIKOLETT	12	16	HARI	WEEKDAYS
523	LUCY	13	15	RAHUL	WEEKDAYS
527	LEKHA	11	14	YEDHU	WEEKDAYS
532	SUJATHA	11	13	RAVI	WEEKENDS

## Justification of DQL:2

From the DQL operation generated above, the company can easily find the tutors who are taking a specific subject and employee who leads them. This can be used when a new student enrolls into a new course and also for evaluating the performance and responsibilities of academic head employees.

## DQL:3

Find the project name, project number, contract expiry year and the name of the manager in charge for the government category projects.



The screenshot shows the phpMyAdmin interface with the following details:

- Server:** 127.0.0.1 » **Database:** da1 » **Table:** project
- Navigation Panel:** Shows a tree structure with databases like 'coursework1\_db', 'cw1', 'da1', and tables like 'department', 'employee', 'project', 'salary', 'tutors'.
- SQL Query:**

```
SELECT p.project_name ,p.projectno, (p.start_date + p.contract) as 'expiry year', p.manager, e.e_name FROM project p , employee e WHERE (p.p_type = 'government' AND p.manager = e.emp_no);
```
- Results:** Showing rows 0 - 1 (2 total, Query took 0.0007 seconds.)
- Table Data:**

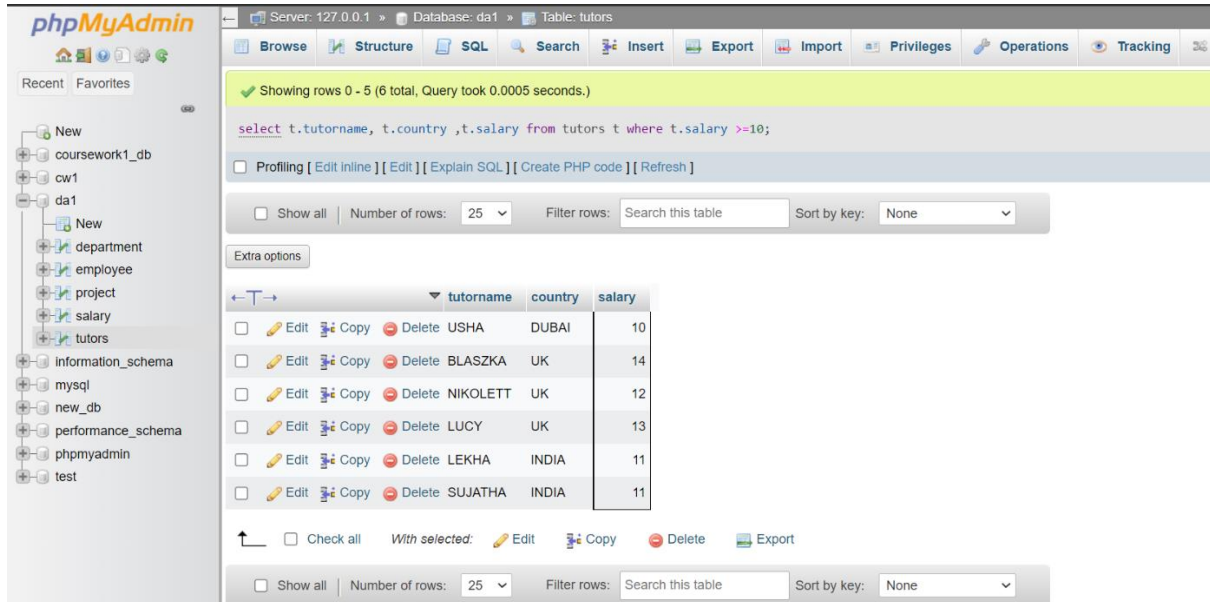
project_name	projectno	expiry year	manager	e_name
ENGLAND	202	2025	14	YEDHU
DUBAI	204	2024	13	RAVI

## Justification of DQL:3

From the DQL operation, we can find the expiry year of the contract that the company have with government or private projects. This will also give the name of the manager who will be knowing more information about the contract and studying more to maintain it by improving as per their requirements.

## DQL:4

Collect the name and country of the tutors who are getting paid greater than or equal to 10 pounds per hour.



The screenshot shows the phpMyAdmin interface. The left sidebar displays a database structure with 'da1' selected, containing tables like 'department', 'employee', 'project', 'salary', and 'tutors'. The main panel shows the 'tutors' table with a SQL query: `select t.tutorname, t.country, t.salary from tutors t where t.salary >=10;`. The results show 6 rows of tutor data.

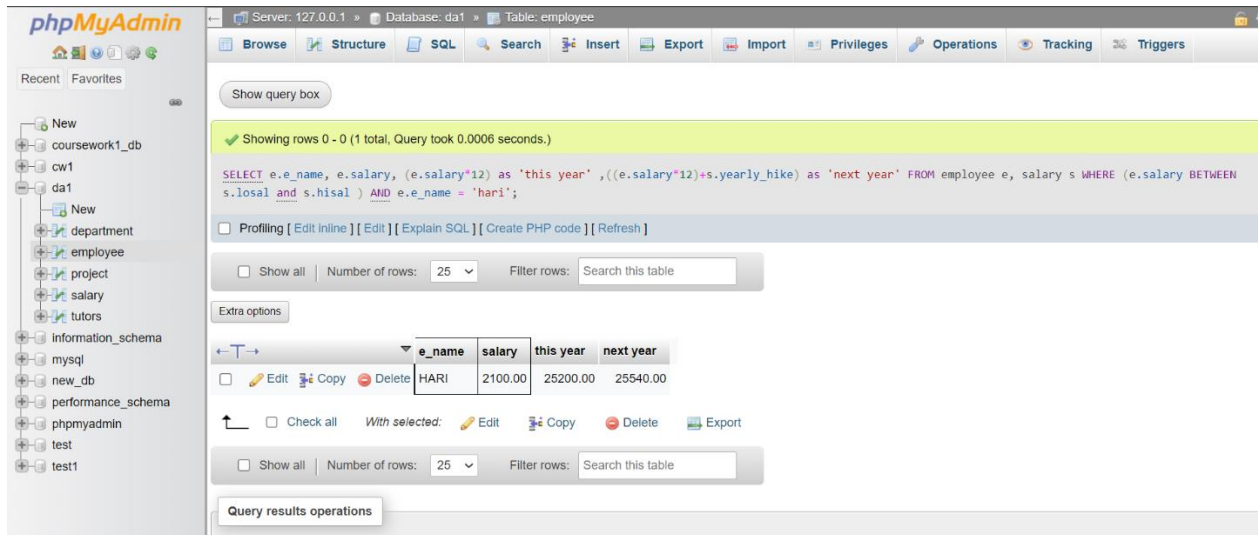
	tutorname	country	salary
<input type="checkbox"/>	USHA	DUBAI	10
<input type="checkbox"/>	BLASZKA	UK	14
<input type="checkbox"/>	NIKOLETT	UK	12
<input type="checkbox"/>	LUCY	UK	13
<input type="checkbox"/>	LEKHA	INDIA	11
<input type="checkbox"/>	SUJATHA	INDIA	11

## Justification of DQL:4

This analysis can help in filtering the payment of tutors from different part of the world. As all these tutors are teaching in every project, the profit that company is getting will be different because of the change in currency and Purchasing Power Parity (PPP). So, by filtering with the payment can help them to understand, which tutor can be provided for the classes in each project.

## DQL:5

Find the annual income of this year and with salary hike for the next year of Hari.



The screenshot shows the phpMyAdmin interface. The left sidebar displays a database structure with 'da1' selected, containing tables like 'department', 'employee', 'project', 'salary', and 'tutors'. The main panel shows the 'employee' table selected. A SQL query is entered in the 'SQL' tab:

```
SELECT e.e_name, e.salary, (e.salary*12) as 'this year' ,((e.salary*12)+s.yearly_hike) as 'next year' FROM employee e, salary s WHERE (e.salary BETWEEN s.losal and s.hisal ) AND e.e_name = 'hari';
```

The query results are displayed in a table with 4 columns: e\_name, salary, this year, and next year. The results show one row for the employee 'HARI'.

e_name	salary	this year	next year
HARI	2100.00	25200.00	25540.00

## Justification of DQL:5

With this query, we can find the annual income of an employ with salary hike. This can help us to calculate and adjust the yearly hike of an employee according to the growth of the company.