

A dark blue vertical bar on the left side of the page. A blue arrow points to the right from the bar, containing the date 7/15/2021.

7/15/2021

# DBMS Project

COMPANY DATABASE

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Rituparna Kundu & Arpita Banik

MSC. DATA SCIENCE

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ROLL NO:

96/DTS NO.200005 (Arpita Banik)

96/DTS NO.200012 (Rituparna Kundu)

UNIVERSITY OF KALYANI

# Introduction

We will use a simple COMPANY database to build an ER model. This database contains information about employees, branches and clients. Important points to note include:

- There are several branches in the company. Each branch has a unique identification, a name and a particular employee who manages the department and the starting date of management.
- There are several employees working for company branches. Each employee has a unique identification number, name containing first and last name, Birth date, sex, salary.
- An employee assigned to one branch, but one branch can include several employees. We also need to know the direct supervisor of each employee. There are many supervisees under one supervisor.
- Company includes several Clients. Each branch handles many clients. Each client has a unique client identification number and a name.
- Several employees can work with several clients to make the total sale for the company.

# Types of entities in Company Database

## 1. Independent Entities

*Independent entities*, also referred to as kernels, are the backbone of the database. They are what other tables are based on. *Kernels* have the following characteristics:

- They are the building blocks of a database.
- The primary key may be simple or composite.
- The primary key is not a foreign key.
- They do not depend on another entity for their existence.

In the company database:

- Employee
- Branch
- Client

## 2. Dependent Entities

*Dependent entities*, also referred to as *derived entities*, depend on other tables for their meaning. These entities have the following characteristics:

- Dependent entities are used to connect two kernels together.
- They are said to be existence dependent on two or more tables.
- Many to many relationships become associative tables with at least two foreign keys.
- They may contain other attributes.
- The foreign key identifies each associated table.

In the Company Database:

- Works for

# Relationships of Company Database

## 1. [One-One Relationship](#)

When a single instance of an entity is associated with a single instance of another entity then it is called one to one relationship.

In the Company Database:

1 Branch is managed by 1 employee.

## 2. [One-Many Relationship](#)

When a single instance of an entity is associated with more than one instances of another entity then it is called one to many relationship.

In the Company Database:

- Many employees can work for 1 branch.
- 1 branch can handle many clients.

## 3. [Many-Many Relationship](#)

When more than one instances of an entity is associated with more than one instances of another entity then it is called many to many relationship.

In the company database:

Many employees can work for many clients.

## 4. [Recursive Relationship](#)

It's a relationship with the same entity.

In the Company Database:

an employee may act as a *supervisor* for one or more employees, while an employee may be *supervised by* an employee (it's one-to-many relationship).

- [Participation](#)

In the Company Database:

- If an employee **must** work for a department, this is sketched by double lines, and called “total or mandatory participation”.
- And if an employee **may or may not** manage a department, this is sketched by a single line and called “partial or optional participation”.

## Attributes of a Company Database

### 1. [Simple Attributes](#)

*Simple attributes* are those drawn from the atomic value domains; they are also called *single-valued attributes*.

In the COMPANY database:

- Emp\_id
- Birth\_date
- Salary
- Sex
- Branch name
- Branch\_id
- Client\_id
- Client\_name
- Start\_date
- Sales

### 2. [Composite Attributes](#)

*Composite attributes* are those that consist of a hierarchy of attributes.

In the Company Database:

- Name consists of First\_Name + Last\_Name

# Keys of Company Database

## 1. Candidate Key

A *candidate key* is a simple or composite key that is unique and minimal. It is unique because no two rows in a table may have the same value at any time. It is minimal because every column is necessary in order to attain uniqueness.

In the COMPANY database :

**Employee** (Emp\_ID, First Name, Last Name, Birth\_Date, Sex, Salary), possible candidate keys are:

- EmpID
- First Name and Last Name – assuming there is no one else in the company with the same name

**Branch** (Branch\_ID, Branch\_Name)

- Branch\_ID , Branch\_Name

**Client**(Client\_ID, Client\_Name)

- Client\_ID
- Client\_Name assuming no two client have the same name.

## 2. Primary Key

The primary key is a candidate key that is selected by the database designer to be used as an identifying mechanism for the whole entity set. It must uniquely identify tuples in a table and not be null. The primary key is indicated in the ER model by underlining the attribute.

In the COMPANY database:

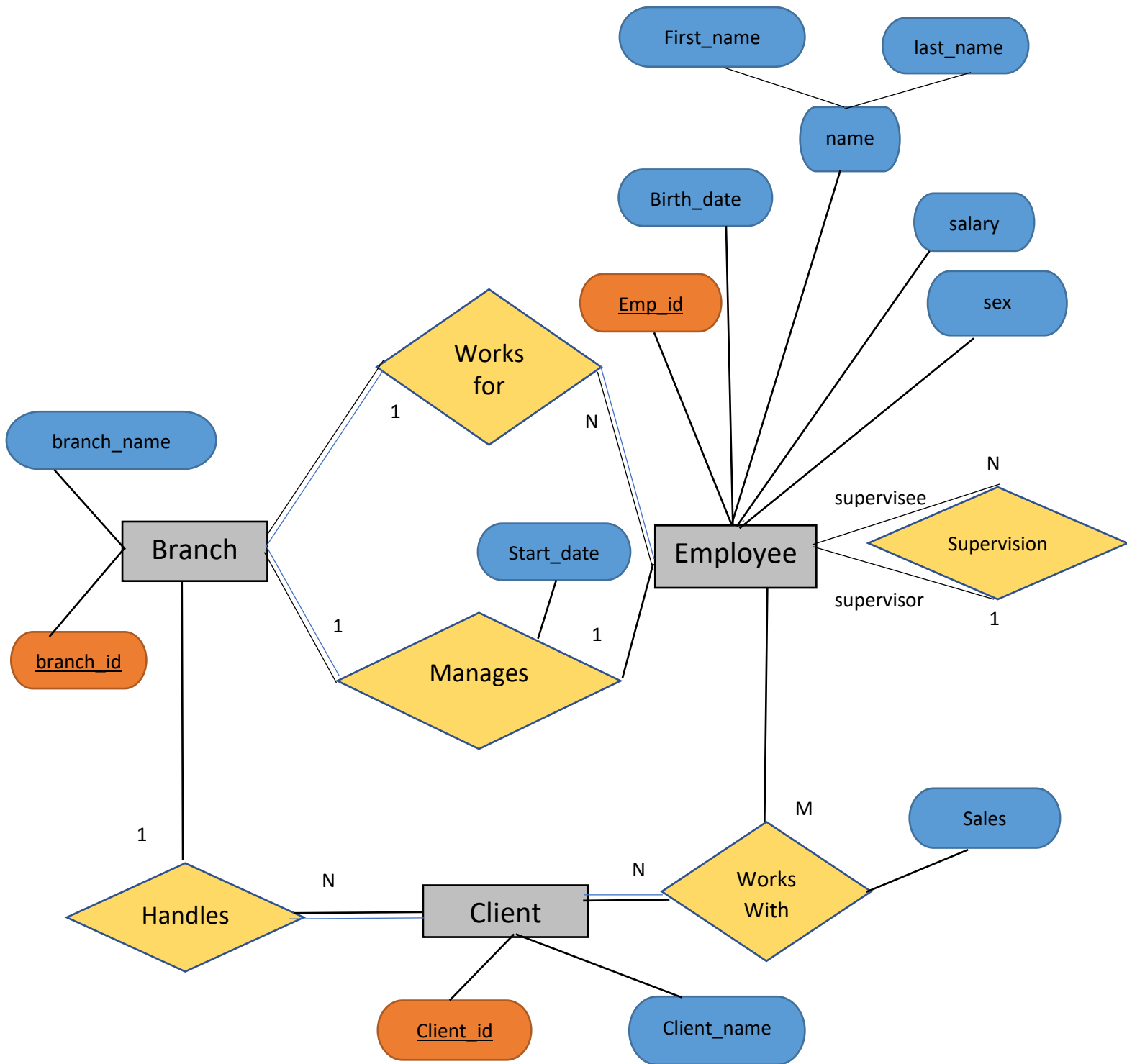
- Employee (Emp\_ID)
- Client (Client\_ID)
- Branch (Branch\_ID)

### 3. Foreign Key

A *foreign key (FK)* is an attribute in a table that references the primary key in another table OR it can be null.

In the COMPANY database:

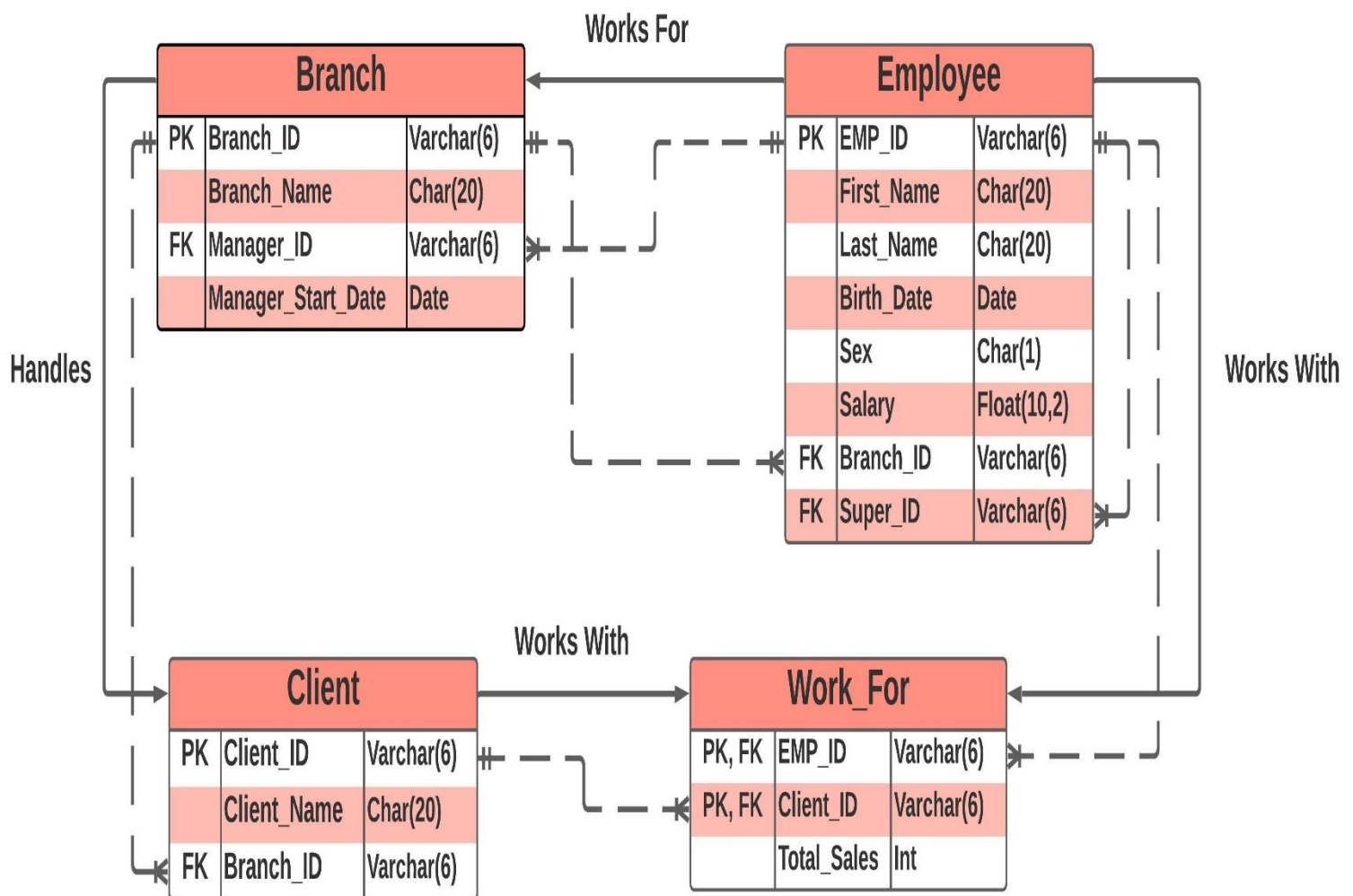
- Super\_id
- Branch\_id
- Manager\_id



**ER Diagram of a Company Database**



# Relational Model drawn from the ER diagram of COMPANY Database



# Table descriptions

Tables in Company Database
Employee
Branch
Client
Work_For

- **EMPLOYEE table**

Field	Type	NULL	Key	Default	Description
EMP_ID	VARCHAR(6)	NO	PRI	NULL	Primary key of Employee
First_Name	CHAR(20)	YES		NULL	
Last_Name	CHAR(20)	YES		NULL	
Birth_Date	DATE	YES		NULL	
Sex	CHAR(1)	YES		NULL	
Salary	FLOAT(10,2)	YES		NULL	
Branch_ID	VARCHAR(6)	YES	MUL	NULL	Foreign key refer to Branch_ID of Branch
Super_ID	VARCHAR(6)	YES	MUL	NULL	Foreign key refer to EMP_ID of Employee

- **BRANCH table**

Field	Type	NULL	Key	Default	Description
Branch_ID	VARCHAR(6)	NO	PRI	NULL	Primary key of Branch
Branch_Name	CHAR(20)	YES		NULL	
Manager_ID	VARCHAR(6)	YES	MUL	NULL	Foreign key refer to EMP_ID of Employee
Manager_Start_Date	DATE	YES		NULL	

- **CLIENT table**

Field	Type	NULL	Key	Default	Description
Client_ID	VARCHAR(10)	NO	PRI	NULL	Primary Key of Client
Client_Name	CHAR(20)	YES		NULL	
Branch_ID	VARCHAR(6)	YES	MUL	NULL	Foreign Key refer to Branch_ID of Branch

- **WORK\_FOR table**

Field	Type	NULL	Key	Default	Description
EMP_ID	VARCHAR(6)	NO	PRI	NULL	Primary key of Sales, Foreign key refer to EMP_ID of Employee
Client_ID	VARCHAR(10)	NO	PRI	NULL	Primary key of Sales, Foreign key refer to EMP_ID of Client
Total_Sale	INT	YES		NULL	

# Table Entries

## Employee

mysql> select \* from employee;

EMP_ID	First_Name	Last_Name	Birth_Date	Sex	Salary	Branch_ID	Super_ID
Emp100	Aksha	Merchant	1990-01-13	F	100000.00	BR1BAN	Emp100
Emp101	Arzu	Nazreen	1993-08-24	F	50000.00	BR5DEL	Emp132
Emp102	Bhumi	Sharma	1976-05-02	F	40000.00	BR4HYD	Emp164
Emp103	Bhuvan	Banerjee	1989-02-26	M	40000.00	BR4HYD	Emp164
Emp104	Srinivas	Yadav	1987-04-05	M	50000.00	BR2MUM	Emp132
Emp105	Arati	Mishra	1982-04-21	F	50000.00	BR3KOL	Emp132
Emp106	Huma	Qureshi	1991-05-08	F	30000.00	BR1BAN	Emp172
Emp107	Shanu	Das	1975-05-10	M	30000.00	BR1BAN	Emp172
Emp108	Atish	Goswami	1988-07-07	M	50000.00	BR4HYD	Emp132
Emp109	Krishanu	Paul	1987-03-04	M	40000.00	BR2MUM	Emp164
Emp110	Pallavi	Singh	1989-05-20	F	30000.00	BR4HYD	Emp172
Emp111	Kapil	Sharma	1979-10-22	M	50000.00	BR3KOL	Emp132
Emp112	Kalpana	Chawla	1975-06-03	F	25000.00	BR1BAN	Emp173
Emp113	Kripa	Karmaker	1975-08-25	F	30000.00	BR1BAN	Emp172
Emp114	Nimmy	Mishra	1976-09-04	F	40000.00	BR4HYD	Emp164
Emp115	Priya	Roy	1989-06-02	F	50000.00	BR4HYD	Emp132
Emp116	Vanhi	Verma	1989-08-29	F	40000.00	BR4HYD	Emp164
Emp117	Anil	Karmaker	1977-10-01	M	50000.00	BR4HYD	Emp132
Emp118	Pawan	Ray	1975-11-20	M	40000.00	BR4HYD	Emp164
Emp119	Pravin	Mishra	1982-08-26	M	50000.00	BR3KOL	Emp132
Emp120	Prakash	Sharma	1983-08-04	M	40000.00	BR3KOL	Emp164
Emp121	Armaan	Malik	1981-03-27	M	25000.00	BR3KOL	Emp174
Emp122	Akaram	Chawla	1993-12-16	M	50000.00	BR5DEL	Emp132
Emp123	Bibhas	Roy	1985-10-02	M	40000.00	BR2MUM	Emp164

Emp124	Chetan	Jindal	1990-08-31	M	30000.00	BR1BAN	Emp172
Emp125	Pallavi	Paul	1990-08-15	F	40000.00	BR1BAN	Emp164
Emp126	Mausam	Sharma	1994-12-06	M	25000.00	BR5DEL	Emp175

Emp127	Sejal	Sharma	1985-04-07	F	40000.00	BR2MUM	Emp164
Emp128	Paroo	Karmaker	1978-01-10	F	50000.00	BR4HYD	Emp132
Emp129	Salil	Majhi	1976-06-25	M	30000.00	BR4HYD	Emp172
Emp130	Sunil	Das	1983-03-19	M	30000.00	BR3KOL	Emp172
Emp131	Ahana	Das	1981-05-13	F	30000.00	BR3KOL	Emp172
Emp132	Arushi	Das	1992-01-01	F	70000.00	BR5DEL	Emp100
Emp133	Aditi	Das	1978-04-04	F	25000.00	BR4HYD	Emp176
Emp134	Aysha	Karmaker	1980-03-14	F	50000.00	BR3KOL	Emp132
Emp135	Brinda	Karmaker	1984-04-03	F	50000.00	BR2MUM	Emp132
Emp136	Dona	Karmaker	1988-01-08	F	25000.00	BR4HYD	Emp177
Emp137	Divya	Sharma	1995-09-30	F	30000.00	BR5DEL	Emp172
Emp138	Diya	Sharma	1987-10-11	F	30000.00	BR4HYD	Emp172
Emp139	Harmeet	Sharma	1981-04-14	F	40000.00	BR3KOL	Emp164
Emp140	Indira	Sharma	1976-07-16	F	30000.00	BR4HYD	Emp172
Emp141	Ishani	Roy	1982-12-21	F	25000.00	BR3KOL	Emp178
Emp142	Ishita	Roy	1994-02-28	F	50000.00	BR5DEL	Emp132
Emp143	Ishika	Roy	1994-08-20	F	40000.00	BR5DEL	Emp164
Emp144	Kamala	Roy	1991-04-02	F	25000.00	BR1BAN	Emp179
Emp145	Kaviya	Verma	1995-03-23	F	40000.00	BR5DEL	Emp164
Emp146	Krishna	Verma	1977-04-22	F	50000.00	BR4HYD	Emp132
Emp147	Leela	Verma	1991-04-18	F	50000.00	BR1BAN	Emp132

Emp148	Mahi	Verma	1983-06-05	F	40000.00	BR3KOL	Emp164
Emp149	Nidhi	Malik	1991-11-21	F	40000.00	BR1BAN	Emp164
Emp150	Priya	Goswami	1979-04-19	F	50000.00	BR2MUM	Emp132
Emp151	Pooja	Acharya	1982-08-06	F	25000.00	BR3KOL	Emp180
Emp152	Priyanka	Ghosh	1990-08-17	F	30000.00	BR1BAN	Emp172
Emp153	Puja	Saha	1994-05-02	F	40000.00	BR5DEL	Emp164
Emp154	Raima	Mukherjee	1995-10-07	F	30000.00	BR5DEL	Emp172
Emp155	Raina	Mukherjee	1979-12-26	F	40000.00	BR3KOL	Emp164
Emp156	Rani	Mukherjee	1988-07-19	F	25000.00	BR4HYD	Emp181
Emp157	Riya	Saha	1979-03-21	F	50000.00	BR2MUM	Emp132

Emp158	Rosy	Saha	1978-01-21	F	25000.00	BR4HYD	Emp182
Emp159	Sheena	Saha	1993-07-07	F	50000.00	BR5DEL	Emp132
Emp160	Shivani	Ghosh	1987-11-11	F	50000.00	BR4HYD	Emp132
Emp161	Sita	Ghosh	1982-02-27	F	30000.00	BR3KOL	Emp172
Emp162	Sutirtha	Nandi	1980-06-21	F	25000.00	BR3KOL	Emp183
Emp163	Aditya	Dutta	1993-07-31	M	40000.00	BR5DEL	Emp164
Emp164	Akash	Dutta	1978-04-25	M	70000.00	BR2MUM	Emp100
Emp165	Arnav	Dutta	1985-01-12	M	50000.00	BR2MUM	Emp132
Emp166	Sudhakar	Dutta	1978-08-17	M	30000.00	BR2MUM	Emp172
Emp167	Ayush	Banerjee	1980-04-10	M	30000.00	BR3KOL	Emp172
Emp168	Adarsh	Banerjee	1989-10-16	M	25000.00	BR4HYD	Emp184
Emp169	Ali	Banerjee	1991-11-09	M	40000.00	BR1BAN	Emp164
Emp170	Amir	Banerjee	1995-09-04	M	50000.00	BR5DEL	Emp132
Emp171	Anirudh	Banerjee	1981-02-22	M	50000.00	BR3KOL	Emp132

Emp172	Ankush	Mishra	1975-09-11	M	70000.00	BR4HYD	Emp100
Emp173	Anish	Mishra	1979-05-30	M	70000.00	BR3KOL	Emp100
Emp174	Anshul	Mishra	1992-01-19	M	25000.00	BR5DEL	Emp185
Emp175	Arnav	Mishra	1979-02-15	M	50000.00	BR2MUM	Emp132
Emp176	Arvind	Mishra	1992-06-14	M	40000.00	BR5DEL	Emp164
Emp177	Barshan	Mishra	1980-06-25	M	50000.00	BR3KOL	Emp132
Emp178	Varun	Paul	1981-02-17	M	30000.00	BR3KOL	Emp172
Emp179	Daksh	Paul	1981-12-13	M	50000.00	BR3KOL	Emp132
Emp180	Deepak	Paul	1984-05-14	M	25000.00	BR2MUM	Emp186
Emp181	Ishani	Paul	1990-04-25	M	50000.00	BR1BAN	Emp132
Emp182	Karan	Kamra	1975-02-27	M	25000.00	BR1BAN	Emp187
Emp183	Kishan	Kamra	1983-11-14	M	40000.00	BR3KOL	Emp164
Emp184	Kunal	Kamra	1980-08-30	M	25000.00	BR3KOL	Emp188
Emp185	Manav	Kamra	1983-12-08	M	30000.00	BR3KOL	Emp172
Emp186	Nasir	Nawaz	1993-04-06	M	40000.00	BR5DEL	Emp164
Emp187	Pranav	Singh	1985-09-21	M	25000.00	BR2MUM	Emp189
Emp188	Pranay	Singh	1985-06-27	M	50000.00	BR2MUM	Emp132
Emp189	Rajesh	Singh	1979-01-08	M	50000.00	BR2MUM	Emp132
Emp190	Rajiv	Singh	1992-05-08	M	50000.00	BR5DEL	Emp132
Emp191	Rishav	Singh	1990-08-08	M	30000.00	BR1BAN	Emp172
Emp192	Ritwik	Singh	1993-04-09	M	25000.00	BR5DEL	Emp190
Emp193	Rohan	Malik	1982-02-16	M	40000.00	BR3KOL	Emp164
Emp194	Rohit	Malik	1986-07-25	M	50000.00	BR2MUM	Emp132
Emp195	Sachin	Malik	1989-07-10	M	30000.00	BR4HYD	Emp172
Emp196	Rudra	Malik	1988-09-30	M	30000.00	BR4HYD	Emp172

Emp197	Sandip	Malik	1984-05-04	M	40000.00	BR2MUM	Emp164
Emp198	Sayandip	Malik	1985-09-23	M	30000.00	BR2MUM	Emp172
Emp199	Shivan	Malik	1984-08-26	M	30000.00	BR2MUM	Emp172
Emp200	Shreyas	Malik	1977-04-19	M	40000.00	BR4HYD	Emp164
Emp201	Sutirtha	Naskar	1980-06-21	M	25000.00	BR5DEL	Emp173

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102 rows in set (0.00 sec)

## Branch

mysql> select \* from branch;

Branch_ID	Branch_Name	Manager_ID	Manager_Start_Date
BR1BAN	Bangalore	Emp100	2015-02-01
BR2MUM	Mumbai	Emp132	2017-05-06
BR3KOL	Kolkata	Emp164	2015-01-13
BR4HYD	Hyderabad	Emp172	2016-11-11
BR5DEL	Delhi	Emp173	2017-10-31

5 rows in set (0.00 sec)

## Client

mysql> select \* from client;

Client_ID	Client_Name	Branch_ID
CLT101	Adam	BR1BAN
CLT102	Andrew	BR1BAN
CLT103	Anthony	BR1BAN
CLT104	Arthur	BR1BAN
CLT105	Brandon	BR1BAN
CLT106	Benjamin	BR1BAN
CLT107	Charles	BR1BAN
CLT108	Christian	BR1BAN
CLT109	Daniel	BR1BAN
CLT110	Davud	BR1BAN
CLT111	Eric	BR2MUM
CLT112	Ethan	BR2MUM
CLT113	Frank	BR2MUM



CLT114	Fred	BR2MUM
CLT115	George	BR2MUM
CLT116	Graham	BR2MUM
CLT117	Henry	BR2MUM
CLT118	Harry	BR2MUM
CLT119	Issac	BR2MUM
CLT120	James	BR2MUM
CLT121	Jonathan	BR3KOL
CLT122	Julian	BR3KOL
CLT123	Jack	BR3KOL
CLT124	Keith	BR3KOL
CLT125	Ken	BR3KOL
CLT126	Loise	BR3KOL
CLT127	Mike	BR3KOL
CLT128	Max	BR3KOL
CLT129	Nathan	BR3KOL
CLT130	Noah	BR3KOL
CLT131	Oliver	BR4HYD
CLT132	Olin	BR4HYD
CLT133	Patrick	BR4HYD
CLT134	Paul	BR4HYD
CLT135	Quinn	BR4HYD
CLT136	Ryan	BR4HYD
CLT137	Rchard	BR4HYD
CLT138	Sean	BR4HYD
CLT139	Stephan	BR4HYD
CLT140	Shane	BR4HYD
CLT141	Timothy	BR5DEL
CLT142	Thomas	BR5DEL
CLT143	Theodor	BR5DEL
CLT144	Ula	BR5DEL
CLT145	Uriel	BR5DEL
CLT146	Valentino	BR5DEL
CLT147	William	BR5DEL
CLT148	Yale	BR5DEL
CLT149	Yoel	BR5DEL
CLT150	Zack	BR5DEL

+-----+-----+-----+

50 rows in set (0.00 sec)

## Work For

mysql> select \* from work\_for;

EMP_ID	Client_ID	Total_Sales
Emp101	CLT106	159862
Emp101	CLT108	125618
Emp102	CLT134	141183
Emp102	CLT147	154697
Emp103	CLT135	95369
Emp103	CLT148	121625
Emp104	CLT130	137538
Emp104	CLT143	184532
Emp105	CLT103	188956
Emp105	CLT105	161868
Emp106	CLT122	94131
Emp106	CLT129	176568
Emp106	CLT145	188454
Emp107	CLT106	89887
Emp107	CLT134	105368
Emp108	CLT107	162748
Emp108	CLT109	185438
Emp109	CLT102	144305
Emp109	CLT141	54190
Emp110	CLT126	78138
Emp110	CLT133	134754
Emp110	CLT149	55167
Emp111	CLT116	69603
Emp111	CLT150	189146
Emp112	CLT104	110688
Emp112	CLT147	105981
Emp113	CLT124	148573
Emp113	CLT131	156567
Emp113	CLT147	97261
Emp114	CLT106	124481
Emp114	CLT145	118988
Emp115	CLT101	169974
Emp115	CLT106	117263
Emp115	CLT123	87058
Emp116	CLT107	181803
Emp116	CLT116	151304
Emp116	CLT139	133323
Emp117	CLT101	165049
Emp117	CLT103	62955
Emp118	CLT108	184117

Emp118	CLT147	199070
Emp119	CLT104	169051
Emp119	CLT121	135583
Emp119	CLT131	118659
Emp120	CLT109	102210
Emp120	CLT129	182165
Emp120	CLT148	68430
Emp121	CLT143	178181
Emp121	CLT148	136601
Emp122	CLT101	91325
Emp122	CLT131	155972
Emp123	CLT136	130315
Emp123	CLT149	138144
Emp124	CLT119	128339
Emp124	CLT126	74979
Emp124	CLT142	179371
Emp125	CLT107	90683
Emp125	CLT146	127840
Emp126	CLT103	192965
Emp126	CLT108	80749
Emp127	CLT105	70640
Emp127	CLT114	54730
Emp127	CLT137	75956
Emp128	CLT119	52219
Emp128	CLT129	133045
Emp128	CLT144	147160
Emp129	CLT104	168092
Emp129	CLT132	186642
Emp130	CLT138	148680
Emp130	CLT143	180090
Emp131	CLT108	60724
Emp131	CLT117	194156
Emp131	CLT140	67317
Emp133	CLT141	138174
Emp133	CLT146	83031
Emp134	CLT110	62067
Emp134	CLT141	154869
Emp135	CLT112	75717
Emp135	CLT143	77110
Emp136	CLT145	83652
Emp136	CLT150	166181
Emp137	CLT120	53806
Emp137	CLT127	181025
Emp137	CLT143	127597
Emp138	CLT121	198300
Emp138	CLT128	68807
Emp138	CLT144	144722
Emp139	CLT137	78586
Emp139	CLT150	141097

Emp140	CLT123	120850
Emp140	CLT130	91586
Emp140	CLT146	113212
Emp141	CLT103	144218
Emp141	CLT146	67382
Emp142	CLT115	195163
Emp143	CLT103	94767
Emp143	CLT138	106755
Emp144	CLT105	190476
Emp144	CLT148	72653
Emp145	CLT104	135516
Emp145	CLT139	75230
Emp146	CLT103	81639
Emp146	CLT117	116149
Emp147	CLT104	129122
Emp147	CLT118	171312
Emp148	CLT103	199377
Emp148	CLT142	135172
Emp149	CLT105	115276
Emp149	CLT144	194896
Emp150	CLT105	166523
Emp150	CLT122	74383
Emp150	CLT132	197977
Emp151	CLT104	157151
Emp151	CLT109	164241
Emp152	CLT127	110476
Emp152	CLT134	173784
Emp153	CLT110	159350
Emp153	CLT130	108715
Emp153	CLT149	106157
Emp154	CLT128	168785
Emp154	CLT135	134239
Emp155	CLT111	130414
Emp155	CLT131	66560
Emp155	CLT150	144159
Emp156	CLT106	94027
Emp156	CLT127	86033
Emp157	CLT109	180887
Emp157	CLT126	154591
Emp157	CLT139	173721
Emp158	CLT108	71910
Emp158	CLT129	169342
Emp159	CLT127	155477
Emp159	CLT128	71959
Emp159	CLT141	188585
Emp160	CLT128	85076
Emp160	CLT129	60056
Emp160	CLT142	73974
Emp161	CLT136	84621

Emp161	CLT141	88153
Emp162	CLT130	179796
Emp163	CLT131	131959
Emp163	CLT144	75058
Emp165	CLT105	146835
Emp165	CLT107	99824
Emp166	CLT137	113489
Emp166	CLT142	69005
Emp167	CLT109	69122
Emp167	CLT118	99821
Emp167	CLT141	181723
Emp168	CLT140	116077
Emp168	CLT145	124295
Emp169	CLT132	190252
Emp169	CLT145	199424
Emp170	CLT102	110729
Emp170	CLT132	148808
Emp171	CLT102	97026
Emp171	CLT104	171106
Emp174	CLT142	186127
Emp174	CLT147	192313
Emp175	CLT104	174058
Emp175	CLT106	139023
Emp176	CLT133	156416
Emp176	CLT146	69874
Emp177	CLT111	188638
Emp177	CLT142	98184
Emp178	CLT139	121222
Emp178	CLT144	136219
Emp179	CLT113	60698
Emp180	CLT144	120022
Emp180	CLT149	125060
Emp181	CLT114	171810
Emp182	CLT106	172521
Emp182	CLT149	100356
Emp183	CLT101	153514
Emp183	CLT140	157324
Emp184	CLT107	103796
Emp184	CLT150	86238
Emp185	CLT125	187940
Emp185	CLT132	121662
Emp185	CLT148	179736
Emp186	CLT104	80642
Emp186	CLT143	143931
Emp187	CLT105	82338
Emp187	CLT126	160370
Emp188	CLT120	157964
Emp188	CLT130	79874
Emp188	CLT145	94040

Emp189	CLT107	117133
Emp189	CLT124	127017
Emp189	CLT137	137128
Emp190	CLT108	194084
Emp190	CLT109	56990
Emp190	CLT125	193398
Emp190	CLT138	67466
Emp191	CLT101	72339
Emp191	CLT129	88712
Emp192	CLT107	175546
Emp192	CLT128	53291
Emp193	CLT103	182098
Emp193	CLT112	107395
Emp193	CLT132	157149
Emp194	CLT126	96613
Emp194	CLT127	196758
Emp194	CLT140	85826
Emp195	CLT103	162304
Emp195	CLT131	142350
Emp196	CLT102	162142
Emp196	CLT130	83040
Emp197	CLT101	61388
Emp197	CLT104	108372
Emp197	CLT113	71440
Emp198	CLT105	128740
Emp198	CLT133	80799
Emp199	CLT107	149012
Emp199	CLT135	161791
Emp200	CLT106	168720
Emp200	CLT115	124757
Emp200	CLT138	144553

+-----+-----+-----+

218 rows in set (0.00 sec)

# Queries

## **1. Count the number of male and female employees**

mysql> select count(sex) as Frequency, Sex from employee group by sex;

+-----+-----+

Frequency	Sex
46	F
56	M

+-----+-----+

2 rows in set (0.00 sec)

## **2. Show names of all the female employees**

mysql> select emp\_id, first\_name, last\_name from employee where sex='F';

+-----+-----+-----+

emp_id	first_name	last_name
Emp100	Aksha	Merchant
Emp101	Arzu	Nazreen
Emp102	Bhumi	Sharma
Emp105	Arati	Mishra
Emp106	Huma	Qureshi
Emp110	Pallavi	Singh
Emp112	Kalpana	Chawla
Emp113	Kripa	Karmaker
Emp114	Nimmy	Mishra
Emp115	Priya	Roy
Emp116	Vanhi	Verma
Emp125	Pallavi	Paul
Emp127	Sejal	Sharma
Emp128	Paroo	Karmaker
Emp131	Ahana	Das
Emp132	Arushi	Das
Emp133	Aditi	Das
Emp134	Aysha	Karmaker
Emp135	Brinda	Karmaker
Emp136	Dona	Karmaker
Emp137	Divya	Sharma
Emp138	Diya	Sharma
Emp139	Harmeet	Sharma
Emp140	Indira	Sharma

Emp141	Ishani	Roy
Emp142	Ishita	Roy
Emp143	Ishika	Roy
Emp144	Kamala	Roy
Emp145	Kaviya	Verma
Emp146	Krishna	Verma
Emp147	Leela	Verma
Emp148	Mahi	Verma
Emp149	Nidhi	Malik
Emp150	Priya	Goswami
Emp151	Pooja	Acharya
Emp152	Priyanka	Ghosh
Emp153	Puja	Saha
Emp154	Raima	Mukherjee
Emp155	Raina	Mukherjee
Emp156	Rani	Mukherjee
Emp157	Riya	Saha
Emp158	Rosy	Saha
Emp159	Sheena	Saha
Emp160	Shivani	Ghosh
Emp161	Sita	Ghosh
Emp162	Sutirtha	Nandi

+-----+-----+

46 rows in set (0.00 sec)

### 3. Name of the clients working with Branch\_id = 'BR2MUM'

mysql> select client\_id, client\_name from client where branch\_id='BR2MUM';

+-----+-----+

client_id	client_name
CLT111	Eric
CLT112	Ethan
CLT113	Frank
CLT114	Fred
CLT115	George
CLT116	Graham
CLT117	Henry
CLT118	Harry
CLT119	Issac
CLT120	James

+-----+-----+

10 rows in set (0.01 sec)



#### 4. Name of the employees working with Branch id = 'BR2MUM'

```
mysql> select emp_id, first_name, last_name from employee where  
branch_id='BR2MUM';
```

emp_id	first_name	last_name
Emp104	Srinivas	Yadav
Emp109	Krishanu	Paul
Emp123	Bibhas	Roy
Emp127	Sejal	Sharma
Emp135	Brinda	Karmaker
Emp150	Priya	Goswami
Emp157	Riya	Saha
Emp164	Akash	Dutta
Emp165	Arnav	Dutta
Emp166	Sudhakar	Dutta
Emp175	Arnav	Mishra
Emp180	Deepak	Paul
Emp187	Pranav	Singh
Emp188	Pranay	Singh
Emp189	Rajesh	Singh
Emp194	Rohit	Malik
Emp197	Sandip	Malik
Emp198	Sayandip	Malik
Emp199	Shivan	Malik

+-----+-----+-----+

19 rows in set (0.00 sec)

#### 5. Show Name of the Managers of all the Branch

```
mysql> select manager_id, first_name, last_name from employee E, branch B  
where E.emp_id=B.manager_id;
```

+-----+-----+-----+

manager_id	first_name	last_name
Emp100	Aksha	Merchant
Emp132	Arushi	Das
Emp164	Akash	Dutta
Emp172	Ankush	Mishra
Emp173	Anish	Mishra

+-----+-----+-----+

5 rows in set (0.00 sec)

### 6.Show Name of the employees having age > 30

```
mysql> select First_Name, Last_Name, year(current_timestamp)-  
year(Birth_date) as Age from employee where TIMESTAMPDIFF(YEAR,  
Birth_Date, CURDATE()) > 30;
```

+-----+-----+-----+

First_Name	Last_Name	Age
Aksha	Merchant	31
Bhumi	Sharma	45
Bhuvan	Banerjee	32
Srinivas	Yadav	34
Arati	Mishra	39
Shanu	Das	46
Atish	Goswami	33
Krishanu	Paul	34
Pallavi	Singh	32
Kapil	Sharma	42
Kalpana	Chawla	46
Kripa	Karmaker	46
Nimmy	Mishra	45
Priya	Roy	32
Vanhi	Verma	32
Anil	Karmaker	44
Pawan	Ray	46
Pravin	Mishra	39
Prakash	Sharma	38
Armaan	Malik	40
Bibhas	Roy	36
Sejal	Sharma	36
Paroo	Karmaker	43
Salil	Majhi	45
Sunil	Das	38
Ahana	Das	40
Aditi	Das	43
Aysha	Karmaker	41
Brinda	Karmaker	37
Dona	Karmaker	33
Diya	Sharma	34
Harmeet	Sharma	40
Indira	Sharma	45
Ishani	Roy	39
Krishna	Verma	44
Mahi	Verma	38
Priya	Goswami	42
Pooja	Acharya	39
Raina	Mukherjee	42
Rani	Mukherjee	33

Riya	Saha	42
Rosy	Saha	43
Shivani	Ghosh	34
Sita	Ghosh	39
Sutirtha	Nandi	41
Akash	Dutta	43
Arnav	Dutta	36
Sudhakar	Dutta	43
Ayush	Banerjee	41
Adarsh	Banerjee	32
Anirudh	Banerjee	40
Ankush	Mishra	46
Anish	Mishra	42
Arnav	Mishra	42
Barshan	Mishra	41
Varun	Paul	40
Daksh	Paul	40
Deepak	Paul	37
Ishani	Paul	31
Karan	Kamra	46
Kishan	Kamra	38
Kunal	Kamra	41
Manav	Kamra	38
Pranav	Singh	36
Pranay	Singh	36
Rajesh	Singh	42
Rohan	Malik	39
Rohit	Malik	35
Sachin	Malik	32
Rudra	Malik	33
Sandip	Malik	37
Sayandip	Malik	36
Shivan	Malik	37
Shreyas	Malik	44
Sutirtha	Naskar	41

+-----+-----+-----+

75 rows in set (0.00 sec)

### 7. Show Name of the employees working in Branch Name = 'Kolkata'

```
mysql> select First_name, Last_name, branch_name from employee E, branch
B where E.Branch_Id=B.Branch_Id and branch_name = 'Kolkata';
```

+-----+-----+-----+

First_name	Last_name	branch_name
Arati	Mishra	Kolkata
Kapil	Sharma	Kolkata

Pravin	Mishra	Kolkata
Prakash	Sharma	Kolkata
Armaan	Malik	Kolkata
Sunil	Das	Kolkata
Ahana	Das	Kolkata
Aysa	Karmaker	Kolkata
Harmeet	Sharma	Kolkata
Ishani	Roy	Kolkata
Mahi	Verma	Kolkata
Pooja	Acharya	Kolkata
Raina	Mukherjee	Kolkata
Sita	Ghosh	Kolkata
Sutirtha	Nandi	Kolkata
Ayush	Banerjee	Kolkata
Anirudh	Banerjee	Kolkata
Anish	Mishra	Kolkata
Barshan	Mishra	Kolkata
Varun	Paul	Kolkata
Daksh	Paul	Kolkata
Kishan	Kamra	Kolkata
Kunal	Kamra	Kolkata
Manav	Kamra	Kolkata
Rohan	Malik	Kolkata

+-----+-----+-----+

25 rows in set (0.00 sec)

### 8. Show name of the clients working with emp id ='EMP104'

mysql> Select client\_name from client, work\_for where client.client\_Id = work\_for.client\_Id and emp\_Id = 'Emp104';

+-----+

client_name
Noah
Theodor

+-----+

2 rows in set (0.01 sec)

### 9. Count the total number of clients in the company

mysql> select count(\*) from client;

+-----+

count(*)
50

+-----+

1 row in set (0.01 sec)

**10. Show name, birthdate, sex of the employee having maximum salary**

```
mysql> select First_Name, Last_Name, Birth_Date, Sex from Employee where  
salary=(select max(salary) from employee);
```

+-----+-----+-----+-----+

First_Name	Last_Name	Birth_Date	Sex
Aksha	Merchant	1990-01-13	F

+-----+-----+-----+-----+

1 row in set (0.01 sec)

**11. Calculate Average Salary**

```
mysql> select avg(salary) from employee;
```

+-----+

avg(salary)
39656.862745

+-----+

1 row in set (0.00 sec)

**12. Display the employees' details who gets salary more than average salary**

```
mysql> select * from employee where salary>(select avg(salary) from  
employee);
```

+-----+-----+-----+-----+-----+-----+-----+

EMP_ID	First_Name	Last_Name	Birth_Date	Sex	Salary	Branch_ID	Super_ID
Emp100	Aksha	Merchant	1990-01-13	F	100000.00	BR1BAN	Emp100
Emp101	Arzu	Nazreen	1993-08-24	F	50000.00	BR5DEL	Emp132
Emp102	Bhumi	Sharma	1976-05-02	F	40000.00	BR4HYD	Emp164

Emp103	Bhuvan	Banerjee	1989-02-26	M	40000.00	BR4HYD	Emp164
Emp104	Srinivas	Yadav	1987-04-05	M	50000.00	BR2MUM	Emp132
Emp105	Arati	Mishra	1982-04-21	F	50000.00	BR3KOL	Emp132
Emp108	Atish	Goswami	1988-07-07	M	50000.00	BR4HYD	Emp132
Emp109	Krishanu	Paul	1987-03-04	M	40000.00	BR2MUM	Emp164
Emp111	Kapil	Sharma	1979-10-22	M	50000.00	BR3KOL	Emp132
Emp114	Nimmy	Mishra	1976-09-04	F	40000.00	BR4HYD	Emp164
Emp115	Priya	Roy	1989-06-02	F	50000.00	BR4HYD	Emp132
Emp116	Vanhi	Verma	1989-08-29	F	40000.00	BR4HYD	Emp164
Emp117	Anil	Karmaker	1977-10-01	M	50000.00	BR4HYD	Emp132
Emp118	Pawan	Ray	1975-11-20	M	40000.00	BR4HYD	Emp164
Emp119	Pravin	Mishra	1982-08-26	M	50000.00	BR3KOL	Emp132
Emp120	Prakash	Sharma	1983-08-04	M	40000.00	BR3KOL	Emp164
Emp122	Akaram	Chawla	1993-12-16	M	50000.00	BR5DEL	Emp132
Emp123	Bibhas	Roy	1985-10-02	M	40000.00	BR2MUM	Emp164
Emp125	Pallavi	Paul	1990-08-15	F	40000.00	BR1BAN	Emp164
Emp127	Sejal	Sharma	1985-04-07	F	40000.00	BR2MUM	Emp164
Emp128	Paroo	Karmaker	1978-01-10	F	50000.00	BR4HYD	Emp132
Emp132	Arushi	Das	1992-01-01	F	70000.00	BR5DEL	Emp100
Emp134	Aysha	Karmaker	1980-03-14	F	50000.00	BR3KOL	Emp132
Emp135	Brinda	Karmaker	1984-04-03	F	50000.00	BR2MUM	Emp132
Emp139	Harmeet	Sharma	1981-04-14	F	40000.00	BR3KOL	Emp164

Emp142	Ishita	Roy	1994-02-28	F	50000.00	BR5DEL	Emp132
Emp143	Ishika	Roy	1994-08-20	F	40000.00	BR5DEL	Emp164
Emp145	Kaviya	Verma	1995-03-23	F	40000.00	BR5DEL	Emp164
Emp146	Krishna	Verma	1977-04-22	F	50000.00	BR4HYD	Emp132
Emp147	Leela	Verma	1991-04-18	F	50000.00	BR1BAN	Emp132
Emp148	Mahi	Verma	1983-06-05	F	40000.00	BR3KOL	Emp164
Emp149	Nidhi	Malik	1991-11-21	F	40000.00	BR1BAN	Emp164
Emp150	Priya	Goswami	1979-04-19	F	50000.00	BR2MUM	Emp132
Emp153	Puja	Saha	1994-05-02	F	40000.00	BR5DEL	Emp164
Emp155	Raina	Mukherjee	1979-12-26	F	40000.00	BR3KOL	Emp164
Emp157	Riya	Saha	1979-03-21	F	50000.00	BR2MUM	Emp132
Emp159	Sheena	Saha	1993-07-07	F	50000.00	BR5DEL	Emp132
Emp160	Shivani	Ghosh	1987-11-11	F	50000.00	BR4HYD	Emp132
Emp163	Aditya	Dutta	1993-07-31	M	40000.00	BR5DEL	Emp164
Emp164	Akash	Dutta	1978-04-25	M	70000.00	BR2MUM	Emp100
Emp165	Arnav	Dutta	1985-01-12	M	50000.00	BR2MUM	Emp132
Emp169	Ali	Banerjee	1991-11-09	M	40000.00	BR1BAN	Emp164
Emp170	Amir	Banerjee	1995-09-04	M	50000.00	BR5DEL	Emp132
Emp171	Anirudh	Banerjee	1981-02-22	M	50000.00	BR3KOL	Emp132
Emp172	Ankush	Mishra	1975-09-11	M	70000.00	BR4HYD	Emp100
Emp173	Anish	Mishra	1979-05-30	M	70000.00	BR3KOL	Emp100
Emp175	Arnav	Mishra	1979-02-15	M	50000.00	BR2MUM	Emp132

Emp176	Arvind	Mishra	1992-06-14	M	40000.00	BR5DEL	Emp164
Emp177	Barshan	Mishra	1980-06-25	M	50000.00	BR3KOL	Emp132
Emp179	Daksh	Paul	1981-12-13	M	50000.00	BR3KOL	Emp132
Emp181	Ishani	Paul	1990-04-25	M	50000.00	BR1BAN	Emp132
Emp183	Kishan	Kamra	1983-11-14	M	40000.00	BR3KOL	Emp164
Emp186	Nasir	Nawaz	1993-04-06	M	40000.00	BR5DEL	Emp164
Emp188	Pranay	Singh	1985-06-27	M	50000.00	BR2MUM	Emp132
Emp189	Rajesh	Singh	1979-01-08	M	50000.00	BR2MUM	Emp132
Emp190	Rajiv	Singh	1992-05-08	M	50000.00	BR5DEL	Emp132
Emp193	Rohan	Malik	1982-02-16	M	40000.00	BR3KOL	Emp164
Emp194	Rohit	Malik	1986-07-25	M	50000.00	BR2MUM	Emp132
Emp197	Sandip	Malik	1984-05-04	M	40000.00	BR2MUM	Emp164
Emp200	Shreyas	Malik	1977-04-19	M	40000.00	BR4HYD	Emp164

+-----+-----+-----+-----+-----+-----+

60 rows in set (0.00 sec)

### 13. show Employee id and client id who has max Total\_sales.

```
mysql> select * from work_for where total_sales=(select max(total_sales)
from work_for);
```

+-----+-----+-----+

EMP_ID	Client_ID	Total_Sales
Emp169	CLT145	199424

+-----+-----+-----+

1 row in set (0.00 sec)



**14. Show names of employees who has salary > 200000.00**

```
mysql> select First_Name, Last_Name, Salary from employee where salary>200000.00;
```

Empty set (0.00 sec)

**15. Client name starts with X**

```
mysql> select client_name from client where client_name like 'X%';
```

Empty set (0.00 sec)

**16. Find employees working with more than 3 clients.**

```
mysql> select Emp_ID, count(Emp_ID) as No_Of_Clients from work_for group by Emp_Id having count(emp_id)>3;
```

Emp_ID	No_Of_Clients
Emp190	4

1 row in set (0.00 sec)

# **Importance of ER diagram**

The following states the importance of Entity-Relationship diagram –

## **Assist the Database Developer**

The ER Diagram assists the design even before the construction of tables begins.

## **Requirements Gathering**

This helps the users to plan how to organize data.

## **Documentation Tool**

ER Diagrams can work as a documentation to make others understand the core of the database.

## **Logic of the database**

It communicates the logical structure of the database to the users.

## **Blueprint**

An ER Diagram is considered as the blueprint of the database.

# **Acknowledgement**

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