PES UNIVERSITY

Electronic City Campus, 1 KM before Electronic City, Hosur Road,
Bangalore-100

PROJECT REPORT
on

"PAYROLL MANAGEMENT SYSTEM"

Submitted in partial fulfillment of the requirements for the V Semester
Database Management System course (UE19CS301)

Bachelor of Engineering
IN
COMPUTER SCIENCE AND ENGINEERING

For the Academic year
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Worked for : 28 hrs

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ASSIGNMENT 2

1. Choice of DBMS

The choice of DBMS is relational since

- Simple Model: A Relational Database system is the most simple model, as it does not require any complex structuring or querying processes.
- Data Accuracy: Multiple tables can be related using foreign keys making it duplicate free.
- Easy Access to Data: Using join queries and conditional statements one can combine all or any number of related tables in order to fetch the required data.
- Data Integrity: Relational reliability amongst the tables in the database helps in avoiding the records from being imperfect, isolated or unrelated.
- Flexibility: It possesses qualities for leveling up, expanding for bigger lengths, as it is endowed with a bendable structure to accommodate the constantly shifting requirements.
- Normalization: The methodical style is maintained for making sure a relational database structure is liberated of any variances that can make a difference in the integrity and accuracy of the tables in the database.
- High Security:As the data is divided amongst the tables of the relational database system, it is possible to make a few tables to be tagged as confidential and others not.

Relational database is implemented using PostgreSQL. This was chosen because

- It's the most popular format and also convenient to execute and use.
- It supports different types of data in the same data tables, at the same time.

- PostgreSQL's speed, security and robustness make it suitable for 99% of applications.

2..sql script files

a. Using CREATE statement to create the database

- CREATE TABLE users(
  user_id INT NOT NULL UNIQUE,
  username VARCHAR(30) NOT NULL,
  password VARCHAR(30),
  email_id VARCHAR(60) UNIQUE,
  user_type VARCHAR(30) DEFAULT 'ADMIN',

CONSTRAINT PK_users PRIMARY KEY(user_id)
);

- CREATE TABLE company(

  comp_id INT NOT NULL UNIQUE,
  comp_addr VARCHAR(50) NOT NULL,
  comp_name VARCHAR(50) NOT NULL unique,
  comp_number INT,

CONSTRAINT PK_company PRIMARY KEY(comp_id)
);

- CREATE TABLE department(

```
dept_id INT NOT NULL UNIQUE,
dept_name VARCHAR(30) NOT NULL UNIQUE,
comp_name varchar(30) not null,
dept_size int not null,
dept_roomno int not null,
dept_head varchar(30) not null,

CONSTRAINT PK_department PRIMARY KEY(dept_id),
CONSTRAINT FK_comp_name FOREIGN KEY(comp_name) references
company(comp_name)
);
```

- CREATE TABLE project(

```
project_id INT NOT NULL UNIQUE,
project_title VARCHAR NOT NULL UNIQUE,
due_date date,

CONSTRAINT PK_project PRIMARY KEY(project_id)
);
```

- CREATE TABLE employee(

```
employee_id INT NOT NULL UNIQUE,
fname VARCHAR(30) NOT NULL,
mname VARCHAR(30) NOT NULL,
lname VARCHAR(30) NOT NULL,
gender char(1) NOT NULL,
dob DATE CHECK ( DOB > '1975-01-01' and dob < '2000-01-01'),
doj DATE CHECK ( DOJ > DOB),
Age INT,
comp_name varchar(30),
dept_name VARCHAR(30),
job_title VARCHAR(30),
```

```
    ph_no INT NOT NULL UNIQUE,
    project_title VARCHAR(30),
    address VARCHAR(50),
    pincode INT,

CONSTRAINT PK_employee PRIMARY KEY(employee_id),
FOREIGN KEY(comp_name) references company(comp_name),
FOREIGN KEY(dept_name) references department(dept_name),
FOREIGN KEY(project_title) references project(project_title)
);
```

- CREATE TABLE bank_account(

```
    account_number INT NOT NULL UNIQUE,
    beneficiary_name VARCHAR(30)  NOT NULL,
    remitter_name VARCHAR(30)  NOT NULL,
    employee_id INT NOT NULL,
    transaction_id INT NOT NULL UNIQUE,
    date_of_transaction DATE NOT NULL,
    amount_transferred INT NOT NULL,

CONSTRAINT PK_bank_account PRIMARY KEY(account_number),
FOREIGN KEY(employee_id) references employee(employee_id)
);
```

- CREATE TABLE paygrade(

```
    paygrade_id INT NOT NULL UNIQUE,
    employee_id INT NOT NULL,
    job_title VARCHAR(30) NOT NULL,
    job_grade VARCHAR(10) NOT NULL,
    basic_salary INT CHECK ( basic_salary > 0),
    bonus INT,
    taxes INT,
```

penalties INT,
final_salary INT,
allowances INT,
total_amount INT NOT NULL,

CONSTRAINT PK_paygrade PRIMARY KEY(paygrade_id),
FOREIGN KEY(employee_id) references employee(employee_id)
);

- CREATE TABLE payroll(

payroll_id INT NOT NULL UNIQUE,
employee_id INT NOT NULL UNIQUE,
transaction_id INT NOT NULL,
account_number INT NOT NULL,
date_of_transaction DATE NOT NULL,
payroll_report VARCHAR(100) NOT NULL,
total_amount INT NOT NULL,

CONSTRAINT PK_payroll PRIMARY KEY (payroll_id),
FOREIGN KEY(employee_id) references employee(employee_id),
FOREIGN KEY(transaction_id) references bank_account(transaction_id),
FOREIGN KEY(account_number) references
bank_account(account_number)
);

```
postgres=# \c payroll
You are now connected to database "payroll" as user "postgres".
payroll=# \d
           List of relations
 Schema |     Name     | Type  |  Owner
--------+--------------+-------+----------
 public | bank_account | table | postgres
 public | company      | table | postgres
 public | department   | table | postgres
 public | employee     | table | postgres
 public | paygrade     | table | postgres
 public | payroll      | table | postgres
 public | project      | table | postgres
 public | users        | table | postgres
(8 rows)
```

3. using INSERT statement to fill the database state

- USERS

INSERT INTO USERS(user_id,username,password,email_id) VALUES (9902,'steve01','324steg','steve01@gmail.com');

INSERT INTO USERS(user_id,username,password,email_id) VALUES (001,’Tejas’,’1fttt2’, 'tejas11@gmail.com’);

INSERT INTO USERS(user_id,username,password,email_id) VALUES (002,’Arjun’,’4vf4w’,’arjun09@gmail.com’);

INSERT INTO USERS(user_id,username,password,email_id) VALUES (003,’Karan’,’gt5ef’,’karan55@gmail.com’);

INSERT INTO USERS(user_id,username,password,email_id) VALUES (004,’Ram’,’fgt42’,’ram65@gmail.com’);

INSERT INTO USERS(user_id,username,password,email_id) VALUES (005,’Jacob ’,’14gtt’,’jacob76@gmail.com’);

INSERT INTO USERS(user_id,username,password,email_id) VALUES (006,’Sudeep’,’1fr6d’,’sudeep@gmail.com’);

INSERT INTOUSERS(user_id,username,password,email_id) VALUES (007,’Suhan’,’1tr5t’,’suhan@gmail.com’);

INSERT INTO USERS(user_id,username,password,email_id) VALUES (008,’Nancy’,’1gyu7’,’nancy@gmail.com’);

```
payroll=# select * from users;
 user_id | username | password |     email_id      | user_type
---------+----------+----------+-------------------+-----------
    9902 | steve01  | 324steg  | steve01@gmail.com | ADMIN
       1 | Tejas    | 1fttt2   | tejas11@gmail.com | ADMIN
       2 | Arjun    | 4vf4w    | arjun09@gmail.com | ADMIN
       3 | Karan    | gt5ef    | karan55@gmail.com | ADMIN
       4 | Ram      | fgt42    | ram65@gmail.com   | ADMIN
       5 | Jacob    | 14gtt    | jacob76@gmail.com | ADMIN
       6 | Sudeep   | 1fr6d    | sudeep@gmail.com  | ADMIN
       7 | Suhan    | 1tr5t    | suhan@gmail.com   | ADMIN
       8 | Nancy    | 1gyu7    | nancy@gmail.com   | ADMIN
(9 rows)
```

- COMPANY

INSERT INTO COMPANY(comp_id,comp_addr,comp_name,comp_number) VALUES (0123,'texas USA','TESLA',990021);

INSERT INTO COMPANY(comp_id,comp_addr,comp_name,comp_number) VALUES (13555,'Amritsar','Jio',45634745);

INSERT INTO COMPANY(comp_id,comp_addr,comp_name,comp_number) VALUES (74184,'TexasUSA','Google',45637547);

INSERT INTO COMPANY(comp_id,comp_addr,comp_name,comp_number) VALUES (13455,'Germany','Spacex',53464763);

INSERT INTO COMPANY(comp_id,comp_addr,comp_name,comp_number) VALUES (83455,'Maharastra','Relaince',45363464);

INSERT INTO COMPANY(comp_id,comp_addr,comp_name,comp_number) VALUES (74884,'Banglore','swiggy',43636633);

INSERT INTO COMPANY(comp_id,comp_addr,comp_name,comp_number) VALUES (93455,'France','Microsoft',36773346);

INSERT INTO COMPANY(comp_id,comp_addr,comp_name,comp_number) VALUES (17455,'Chennai','Zomato',364477344);

INSERT INTO COMPANY(comp_id,comp_addr,comp_name,comp_number) VALUES (76884,'Kolkata','Amazon',346737344);

```
payroll=# select * from company;
 comp_id | comp_addr  | comp_name | comp_number
---------+------------+-----------+-------------
     123 | texas USA  | TESLA     |      990021
   13555 | Amritsar   | Jio       |    45634745
   74184 | TexasUSA   | Google    |    45637547
   13455 | Germany    | Spacex    |    53464763
   83455 | Maharastra | Reliance  |    45363464
   74884 | Banglore   | swiggy    |    43636633
   93455 | France     | Microsoft |    36773346
   17455 | Chennai    | zomato    |   364477344
   76884 | Kolkata    | Amazon    |   346737344
(9 rows)
```

- DEPARTMENT

```
INSERT INTO
DEPARTMENT(dept_id,dept_name,comp_name,dept_size,dept_roomno,
dept_head) VALUES (0767,'Management','TESLA',20,34,'manak S
agarwal');

INSERT INTO
DEPARTMENT(dept_id,dept_name,comp_name,dept_size,dept_roomno,de
pt_head) VALUES (00012,’delivery’,’swiggy’,20,30,’Mayank s agarwal’);

INSERT INTO
DEPARTMENT(dept_id,dept_name,comp_name,dept_size,dept_roomno,de
pt_head) VALUES (00022,’development’,’Jio’,25,34,’Andrew’);

 INSERT INTO
DEPARTMENT(dept_id,dept_name,comp_name,dept_size,dept_roomno,de
pt_head) VALUES (00032,’research’,’Spacex’,18,28,’Mattew’);

 INSERT INTO
DEPARTMENT(dept_id,dept_name,comp_name,dept_size,dept_roomno,de
pt_head) VALUES (00012,’sales’,’zomato’,40,44,’Sundar pichai’);

 INSERT INTO
DEPARTMENT(dept_id,dept_name,comp_name,dept_size,dept_roomno,de
pt_head) VALUES (00234,’testing’,’Microsoft’,25,10,’Amith yadav’);

 INSERT INTO
DEPARTMENT(dept_id,dept_name,comp_name,dept_size,dept_roomno,de
pt_head) VALUES (03565,’inquiry’,’Goolge’,50,21,’Mohan r’);

 INSERT INTO
DEPARTMENT(dept_id,dept_name,comp_name,dept_size,dept_roomno,de
pt_head) VALUES (23425,’production’,’Amazon’,15,05,’Akshay r’);

 INSERT INTO
DEPARTMENT(dept_id,dept_name,comp_name,dept_size,dept_roomno,de
pt_head) VALUES (00893,’accounting’,’Reliance’,23,43,’Anirudh b mitta’);
```

```
payroll=# select * from department;
 dept_id |  dept_name  | comp_name | dept_size | dept_roomno |    dept_head
---------+-------------+-----------+-----------+-------------+------------------
     767 | Management  | TESLA     |        20 |          34 | manak S agarwal
      12 | delivery    | swiggy    |        20 |          30 | Mayank s agarwal
      22 | development | Jio       |        25 |          34 | Andrew
      32 | research    | Spacex    |        18 |          28 | Mattew
     112 | sales       | zomato    |        40 |          44 | Sundar pichai
     234 | testing     | Microsoft |        25 |          10 | Amith yadav
    3565 | inquiry     | Google    |        50 |          21 | Mohan r
   23425 | production  | Amazon    |        15 |           5 | Akshay r
     893 | accounting  | Reliance  |        23 |          43 | Anirudh b mitta
(9 rows)
```

- PROJECT

INSERT INTO PROJECT(project_id,project_title,due_date) VALUES (435,'Website management','2019-10-19');

INSERT INTO PROJECT(project_id,project_title,due_date) VALUES (2501,’app development’,"2020-12-10);

INSERT INTO PROJECT(project_id,project_title,due_date) VALUES (422,’food delivery’,"2021-02-08");

INSERT INTO PROJECT(project_id,project_title,due_date) VALUES (7124,’graphic designing’,"2023-12-23");

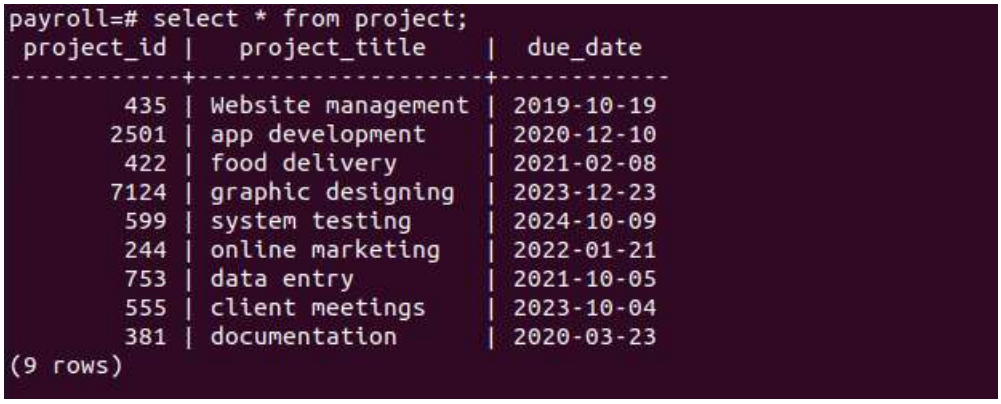
INSERT INTO PROJECT(project_id,project_title,due_date) VALUES (599,’system testing’,"2024-10-09");

INSERT INTO PROJECT(project_id,project_title,due_date) VALUES (244,’online marketing’,"2022-01-21");

INSERT INTO PROJECT(project_id,project_title,due_date) VALUES (753,’data entry’,"2021-10-05");

INSERT INTO PROJECT(project_id,project_title,due_date) VALUES (555,’client meetings’,"2023-10-04");

INSERT INTO PROJECT(project_id,project_title,due_date) VALUES (381,’documentation’,"2020-03-23");



```
payroll=# select * from project;
 project_id |   project_title    |  due_date
------------+--------------------+------------
        435 | Website management | 2019-10-19
       2501 | app development    | 2020-12-10
        422 | food delivery      | 2021-02-08
       7124 | graphic designing  | 2023-12-23
        599 | system testing     | 2024-10-09
        244 | online marketing   | 2022-01-21
        753 | data entry         | 2021-10-05
        555 | client meetings    | 2023-10-04
        381 | documentation      | 2020-03-23
(9 rows)
```

- EMPLOYEE

INSERT INTO EMPLOYEE(employee_id,fname,mname,lname,gender,dob,doj,age,comp_name,dept_name,job_title,ph_no,project_title,address,pincode) values (0104,'Manak','s','agarwal','M','1985-03-05','2003-05-12',36,'TESLA','Management','Manager',3534657,'Website management','attibele benagluru',345753);

INSERT INTO EMPLOYEE(employee_id,fname,mname,lname,gender,dob,doj,age,comp_name,dept_name,job_title,ph_no,project_title,address,pincode) values (2345,’Mohan’,’R ’,’nayak ’,’M ’,"1989-05-25","2010-11-12",32,’swiggy’,’delivery’,’vice president’,3534657,‘food delivery’,’kormangla’,945753);

INSERT INTO EMPLOYEE(employee_id,fname,mname,lname,gender,dob,doj,age,comp_name,dept_name,job_title,ph_no,project_title,address,pincode) values (3484,’ Shankar’,’G’,’singh’,’M ’,"1989-03-05","2010-11-12",32,’Jio’,’development’,’developer’,3534367,‘app development’,’mount olympus’,325853);

INSERT INTO EMPLOYEE(employee_id,fname,mname,lname,gender,dob,doj,age,comp_name,dept_name,job_title,ph_no,project_title,address,pincode) values (3548,’ Sudeep’,’n ’,’k ’,’F ’,"1998-03-05","2021-09-12",23,’Relaince’,’accounting’,’ceo’,8554657,‘data entry’,’washington dc’,340753);

INSERT INTO EMPLOYEE(employee_id,fname,mname,lname,gender,dob,doj,age,comp_n

ame,dept_name,job_title,ph_no,project_title,address,pincode) values
(3847,’ Yang’,’ su ’,’woo ’,’F ’,"1985-03-05","2007-05-
12",36,’Zomato’,’sales’,’supervisor’,42783557,’online marketing’,’beijing’,849223);

INSERT INTO
EMPLOYEE(employee_id,fname,mname,lname,gender,dob,doj,age,comp_n
ame,dept_name,job_title,ph_no,project_title,address,pincode) values
(3871,’ Siri’,’S ’,’nayak ’,’F ’,"1995-06-16","2019-04-
12",26,’Google’,’inquiry’,’manager’,3467357,‘client meetings’,’delhi’,245753);

INSERT
INTO
EMPLOYEE(employee_id,fname,mname,lname,gender,dob,doj,age,comp_n
ame,dept_name,job_title,ph_no,project_title,address,pincode) values
(4534,’ Elon’,’musk’,’S ’,’M’,"1985-04-27","2006-05-
18",36,’Amazon’,’production’,’employee’,7774657,‘online marketing’,’electronic
city’,345753);

INSERT INTO
EMPLOYEE(employee_id,fname,mname,lname,gender,dob,doj,age,comp_n
ame,dept_name,job_title,ph_no,project_title,address,pincode) values
(7364,’ Jeff’,’X ’,’bezoz ’,’M ’,"1994-09-05","2018-08-
21",25,’Spacex’,’research’,’managing director’,3537087,‘documentation’,’elctronic
city’,399553);

INSERT INTO
EMPLOYEE(employee_id,fname,mname,lname,gender,dob,doj,age,comp_n
ame,dept_name,job_title,ph_no,project_title,address,pincode) values
(7556,’ Chandana’,’h ’,’ b’,’F ’,"1996-03-12","2021-06-
11",25,’Microsoft’,’testing’,’manager’,355565,’system testing’,’bombay’,378753);

```
payroll=# select * from employee;
 employee_id |  fname  | mname |  lname  | gender | age |    dob     |    doj     | comp_name | dept_name |     job_title     | ph_no  |  project_title   |      address      | pincode
-------------+---------+-------+---------+--------+-----+------------+------------+-----------+-----------+-------------------+--------+------------------+-------------------+---------
         104 | Manak   | s     | agarwal | M      |  36 | 1985-03-05 | 2003-05-12 | TESLA     | Management | Manager           |  3534657 | Website management | attibele benagluru |  345753
        2345 | Mohan   | R     | nayak   | M      |  32 | 1989-05-25 | 2010-11-12 | swiggy    | delivery   | vice president    | 35346027 | food delivery    | kormangla         |  945753
        3484 | Shankar | G     | singh   | M      |  32 | 1989-03-05 | 2010-11-12 | Jio       | development | developer         |  3534367 | app development  | mount olympus     |  325853
        3548 | Sudeep  | n     | k       | F      |  23 | 1998-03-05 | 2021-09-12 | Reliance  | accounting | ceo               |  8554657 | data entry       | washington dc     |  340753
        3847 | Yang    | su    | woo     | F      |  36 | 1985-03-05 | 2007-05-12 | zomato    | sales      | supervisor        | 42783557 | online marketing | beijing           |  849223
        3871 | Siri    | S     | nayak   | F      |  26 | 1995-06-16 | 2019-04-12 | Google    | inquiry    | manager           |  3467357 | client meetings  | delhi             |  245753
        4534 | Elon    | musk  | S       | M      |  36 | 1985-04-27 | 2006-05-18 | Amazon    | production | employee          |  7774657 | online marketing | electronic city   |  345753
        7364 | Jeff    | X     | bezoz   | M      |  25 | 1994-09-05 | 2018-08-21 | Spacex    | research   | managing director |  3537087 | documentation    | elctronic city    |  399553
        7556 | Chandana | h    | b       | F      |  25 | 1996-03-12 | 2021-06-11 | Microsoft | testing    | manager           |   355565 | system testing   | bombay            |  378753
(9 rows)
```

- BANK_ACCOUNT

```
INSERT INTO
bank_account(account_number,beneficiary_name,remitter_name,employee
_id,transaction_id,date_of_transaction,amount_transferred) VALUES
(123123123,'Manak S agarwal','TESLA',0104,26378,'2021-10-29',35000);

INSERT INTO  BANK
  ACCOUNT(account_number,beneficiary_name,remitter_name,employee_i
  d,transaction_id,date_of_transaction,amount_transferred) VALUES
  (423546565,"mohan r nayak","harry",3548,6968745,"2021-10-29",95000);

INSERT INTO  BANK
  ACCOUNT(account_number,beneficiary_name,remitter_name,employee_i
  d,transaction_id,date_of_transaction,amount_transferred) VALUES
  (436543766,"shankar g singh","lily
",7556,5685767,"2021-04-09",67000);

INSERT INTO  BANK
  ACCOUNT(account_number,beneficiary_name,remitter_name,employee_i
  d,transaction_id,date_of_transaction,amount_transferred) VALUES
  (465768954,"sudeep n k","julie",2345,1341546,"2021-08-02",100000);

INSERT INTO  BANK
  ACCOUNT(account_number,beneficiary_name,remitter_name,employee_i
  d,transaction_id,date_of_transaction,amount_transferred) VALUES
  (546576234,"yang su woo","kelvin",7364,2837656,"2021-09-12",26000);

INSERT INTO  BANK
  ACCOUNT(account_number,beneficiary_name,remitter_name,employee_i
  d,transaction_id,date_of_transaction,amount_transferred) VALUES
  (687546546,"siri s nayak","maria",3871,3564376,"2021-06-23",74000);

INSERT INTO  BANK
  ACCOUNT(account_number,beneficiary_name,remitter_name,employee_i
  d,transaction_id,date_of_transaction,amount_transferred) VALUES
  (726123453,"elon musk s","susan",3484,4826778,"2021-10-07",75000);
```

INSERT INTO BANK ACCOUNT(account_number,beneficiary_name,remitter_name,employee_id,transaction_id,date_of_transaction,amount_transferred) VALUES (745643651,"jeff x bezoz","eva",4534,3245746,"2021-10-22",45000);

INSERT INTO BANK ACCOUNT(account_number,beneficiary_name,remitter_name,employee_id,transaction_id,date_of_transaction,amount_transferred) VALUES (983756313,"chandana h b","olivia",3847,3786535,"2021-10-29",33000);

```
payroll=# select * from bank_account;
 account_number | beneficiary_name | remitter_name | employee_id | transaction_id | date_of_transaction | amount_transferred
----------------+------------------+---------------+-------------+----------------+---------------------+--------------------
      123123123 | Manak S agarwal  | TESLA         |         104 |          26378 | 2021-10-29          |              35000
      423546565 | mohan r nayak    | harry         |        3548 |        6968745 | 2021-10-29          |              95000
      436543766 | shankar g singh  | lily\r       +|        7556 |        5685767 | 2021-04-09          |              67000
                |                  |               |             |                |                     |
      465768954 | sudeep n k       | julie         |        2345 |        1341546 | 2021-08-02          |             100000
      546576234 | yang su woo      | kelvin        |        7364 |        2837656 | 2021-09-12          |              26000
      687546546 | siri s nayak     | maria         |        3871 |        3564376 | 2021-06-23          |              74000
      726123453 | elon musk s      | susan         |        3484 |        4826778 | 2021-10-07          |              75000
      745643651 | jeff x bezoz     | eva           |        4534 |        3245746 | 2021-10-22          |              45000
      983756313 | chandana h b     | olivia        |        3847 |        3786535 | 2021-10-29          |              33000
(9 rows)
```

- PAYGRADE

INSERT INTO PAYGRADE(paygrade_id,employee_id,job_title,job_grade,basic_salary,bonus,taxes,penalties,final_salary,allowances,total_amount) VALUES (6537,0104,'Manager','A',32000,3000,1000,1000,33000,2000,35000);

INSERT INTO PAYGRADE(paygrade_id,employee_id,job_title,job_grade,basic_salary,bonus,taxes,penalties,final_salary,allowances,total_amount) VALUES (2200,2345,"vice-president","B",45000,3000,7000,800,40200,600,40800);

INSERT INTO PAYGRADE(paygrade_id,employee_id,job_title,job_grade,basic_salary,bonus,taxes,penalties,final_salary,allowances,total_amount) VALUES (2205,3484,"developer","S",80000,10000,11000,200,78800,600,79400);

INSERT INTO PAYGRADE(paygrade_id,employee_id,job_title,job_grade,basic_salary,bonus,taxes,penalties,final_salary,allowances,total_amount) VALUES (2564,3847,"supervisor","A",50000,6000,9000,500,46500,600,471000);

INSERT INTO PAYGRADE(paygrade_id,employee_id,job_title,job_grade,basic_salary,bo

nus,taxes,penalties,final_salary,allowances,total_amount) VALUES (6065,3871,"manager","A",55000,10000,10000,800,54500,800,55500);

INSERT INTO PAYGRADE(paygrade_id,employee_id,job_title,job_grade,basic_salary,bonus,taxes,penalties,final_salary,allowances,total_amount) VALUES (6537,4534,"employee","A",32000,3000,1000,1000,33000,2000,35000);

INSERT INTO PAYGRADE(paygrade_id,employee_id,job_title,job_grade,basic_salary,bonus,taxes,penalties,final_salary,allowances,total_amount) VALUES (6789,7364,"managing director","d",10000,600,300,200,10100,600,10700);

INSERT INTO PAYGRADE(paygrade_id,employee_id,job_title,job_grade,basic_salary,bonus,taxes,penalties,final_salary,allowances,total_amount) VALUES (7045,7556,"manager","A",50000,15000,9000,500,55500,600,56100
);

INSERT INTO PAYGRADE(paygrade_id,employee_id,job_title,job_grade,basic_salary,bonus,taxes,penalties,final_salary,allowances,total_amount) VALUES (2056,3548,"ceo","A",30000,8000,4000,100,34900,600,35500);

```
payroll=# select * from paygrade;
 paygrade_id | employee_id |     job_title     | job_grade | basic_salary | bonus | taxes | penalties | final_salary | allowances | total_amount
-------------+-------------+-------------------+-----------+--------------+-------+-------+-----------+--------------+------------+--------------
        6537 |         104 | Manager           | A         |        32000 |  3000 |  1000 |      1000 |        33000 |       2000 |        35000
        2200 |        2345 | vice-president    | B         |        45000 |  3000 |  7000 |       800 |        40200 |        600 |        40800
        2205 |        3484 | developer         | S         |        80000 | 10000 | 11000 |       200 |        78800 |        600 |        79400
        2564 |        3847 | supervisor        | A         |        50000 |  6000 |  9000 |       500 |        46500 |        600 |       471000
        6065 |        3871 | manager           | A         |        55000 | 10000 | 10000 |       800 |        54500 |        800 |        55500
        6547 |        4534 | employee          | A         |        32000 |  3000 |  1000 |      1000 |        33000 |       2000 |        35000
        6789 |        7364 | managing director | d         |        10000 |   600 |   300 |       200 |        10100 |        600 |        10700
        7045 |        7556 | manager           | A         |        50000 | 15000 |  9000 |       500 |        55500 |        600 |        56100
        2056 |        3548 | ceo               | A         |        30000 |  8000 |  4000 |       100 |        34900 |        600 |        35500
(9 rows)
```

- PAYROLL

INSERT INTO PAYROLL(payroll_id,employee_id,transaction_id,account_number,date_of_transaction,payroll_report,total_amount) VALUES (3267,0104,26378,123123123,'2021-10-29','employee has done a great job!!',35000);

INSERT INTO

```
PAYROLL(payroll_id,employee_id,transaction_id,account_number,date_of
_transaction,payroll_report,total_amount) VALUES
(23,3548,6968745,423546565,"2021-10-29","Success",35500);

INSERT INTO
PAYROLL(payroll_id,employee_id,transaction_id,account_number,date_of
_transaction,payroll_report,total_amount) VALUES
(34,1347,1983475,346524354,"2021-04-03","Success",47100);

INSERT INTO
PAYROLL(payroll_id,employee_id,transaction_id,account_number,date_of
_transaction,payroll_report,total_amount) VALUES
(35,3847,3786535,983756313,"2021-10-29","Success",56100);

INSERT INTO
PAYROLL(payroll_id,employee_id,transaction_id,account_number,date_of
_transaction,payroll_report,total_amount) VALUES
(43,7556,5685767,436543766,"2021-04-09","Success",40800);

INSERT INTO
PAYROLL(payroll_id,employee_id,transaction_id,account_number,date_of
_transaction,payroll_report,total_amount) VALUES
(45,4534,3245746,745643651,"2021-10-22","Success",10700);

INSERT INTO
PAYROLL(payroll_id,employee_id,transaction_id,account_number,date_of
_transaction,payroll_report,total_amount) VALUES
(54,3871,3564376,687546546,"2021-06-23","Success",55500);

INSERT INTO
PAYROLL(payroll_id,employee_id,transaction_id,account_number,date_of
_transaction,payroll_report,total_amount) VALUES
(63,2345,1341546,465768954,"2021-08-02","Success",79400);

INSERT INTO
PAYROLL(payroll_id,employee_id,transaction_id,account_number,date_of
_transaction,payroll_report,total_amount) VALUES
(87,3484,4826778,726123453,"2021-10-07","Success",35000);
```

4. Using queries to manipulate data in the database

SIMPLE QUERIES

```
payroll=# SELECT * from employee WHERE comp_name = 'Microsoft';
 employee_id |   fname   | mname | lname | gender | age |    dob     |    doj     | comp_name | dept_name | job_title | ph_no  | project_title  | address | pincode
-------------+-----------+-------+-------+--------+-----+------------+------------+-----------+-----------+-----------+--------+----------------+---------+---------
        7556 |  Chandana | h     | b     | F      |  25 | 1996-03-12 | 2021-06-11 | Microsoft | testing   | manager   | 355565 | system testing | bombay  |  378753
(1 row)
```

```
payroll=# UPDATE department SET dept_size = 50 WHERE dept_name = 'sales' returning dept_size as department_size;
 department_size
-----------------
              50
(1 row)

UPDATE 1
```

```
payroll=# DELETE from users WHERE username = 'sufan';
DELETE 0
payroll=#
```

```
payroll=# ALTER TABLE company
ALTER COLUMN comp_number TYPE bigint;
ALTER TABLE
```

```
payroll=# DROP TABLE if exists Salary;
NOTICE:  table "salary" does not exist, skipping
DROP TABLE
```

COMPLEX QUERIES

```
payroll=# CREATE VIEW salary as SELECT * from paygrade WHERE final_salary>40000 and job_grade='A';
CREATE VIEW
payroll=# select * from salary;
 paygrade_id | employee_id | job_title  | job_grade | basic_salary | bonus | taxes | penalties | final_salary | allowances | total_amount
-------------+-------------+------------+-----------+--------------+-------+-------+-----------+--------------+------------+--------------
        2564 |        3847 | supervisor | A         |        50000 |  6000 |  9000 |       500 |        46500 |        600 |       471000
        6065 |        3871 | manager    | A         |        55000 | 10000 | 10000 |       800 |        54500 |        800 |        55500
        7045 |        7556 | manager    | A         |        50000 | 15000 |  9000 |       500 |        55500 |        600 |        56100
(3 rows)
```

```
payroll=# SELECT e.fname,p.project_title,p.due_date
payroll-# FROM project as p
payroll-# INNER join  employee as e ON
payroll-# e.project_title = p.project_title;
   fname   |   project_title     |  due_date
-----------+---------------------+------------
 Manak     | Website management  | 2019-10-19
  Shankar  | app development     | 2020-12-10
 Mohan     | food delivery       | 2021-02-08
  Chandana | system testing      | 2024-10-09
  Elon     | online marketing    | 2022-01-21
  Yang     | online marketing    | 2022-01-21
  Sudeep   | data entry          | 2021-10-05
  Siri     | client meetings     | 2023-10-04
  Jeff     | documentation       | 2020-03-23
(9 rows)
```

```
payroll=# SELECT dept_roomno,
payroll-# CASE WHEN dept_roomno < 26 THEN 'Groundfloor'
payroll-#      WHEN dept_roomno > 25 THEN 'Firstfloor'
payroll-# END
payroll-# FROM department;
 dept_roomno |    case
-------------+-------------
          34 | Firstfloor
          30 | Firstfloor
          34 | Firstfloor
          28 | Firstfloor
          10 | Groundfloor
          21 | Groundfloor
           5 | Groundfloor
          43 | Firstfloor
          44 | Firstfloor
(9 rows)
```

```
payroll=# CREATE FUNCTION get(int) RETURNS
payroll-# setof integer as
payroll-# $BODY$
payroll$# BEGIN
payroll$#     RETURN QUERY SELECT age
payroll$#                  FROM employee
payroll$#                  WHERE age>=30;
payroll$#     RETURN;
payroll$# END
payroll$# $BODY$
payroll-# LANGUAGE plpgsql; select * from get(8);
CREATE FUNCTION
 get
-----
  36
  32
  32
  36
  36
(5 rows)
```

```
payroll=# SELECT e.gender,
       sum(p.total_amount),
       avg(p.total_amount)
 FROM
employee as e,
 payroll as p
GROUP BY
  e.gender
ORDER BY
  e.gender;
 gender |   sum   |        avg
--------+---------+--------------------
 F      | 1496000 | 41555.555555555556
 M      | 1870000 | 41555.555555555556
(2 rows)
```

NESTED QUERIES

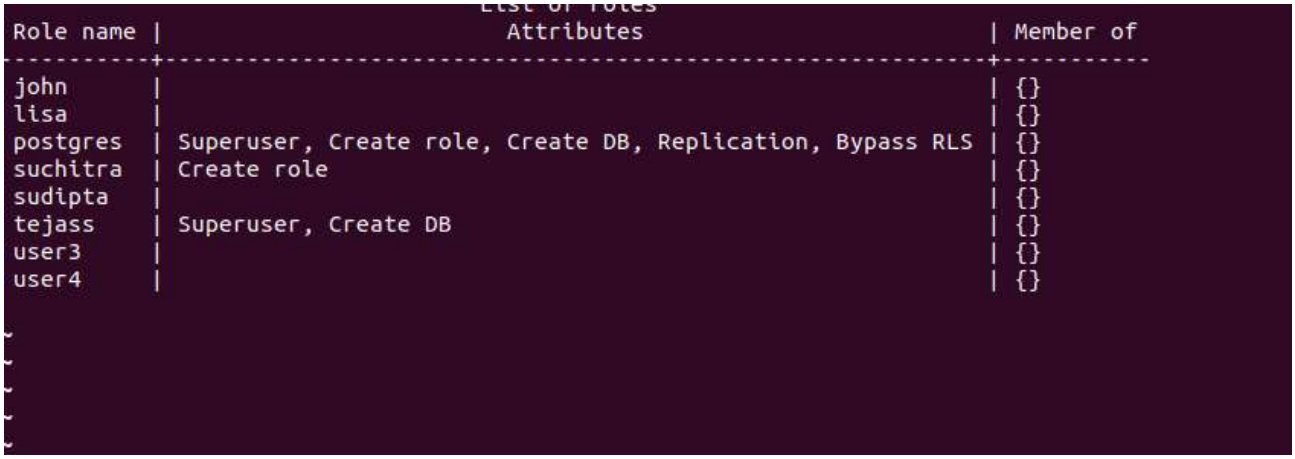
```
payroll=# UPDATE paygrade
payroll-#    SET basic_salary = basic_salary +( basic_salary * 0.10)
payroll-#    WHERE employee_id in (SELECT employee_id FROM employee) returning employee_id,basic_salary;
 employee_id | basic_salary
-------------+--------------
         104 |        35200
        2345 |        49500
        3484 |        88000
        3847 |        55000
        3871 |        60500
        4534 |        35200
        7364 |        11000
        7556 |        55000
        3548 |        33000
(9 rows)

UPDATE 9
```

5. Creating users and granting privileges

```
payroll=# create user suchitra with password 'suchitra123';
CREATE ROLE
payroll=# create user sudipta  with password 'sudipta123';
CREATE ROLE
payroll=# create user john  with password 'john123';
CREATE ROLE
payroll=# create user lisa with password 'lisa123';
CREATE ROLE
payroll=# grant all privileges on database payroll to suchitra;
GRANT
payroll=# alter user tejass createdb;
ALTER ROLE
payroll=# alter user tejass with superuser;
ALTER ROLE
```

```
payroll=# alter user sudipta login;
ALTER ROLE
payroll=# \du
payroll=#
payroll=# grant insert on all tables in schema public to john;
GRANT
payroll=# grant delete on all tables in schema public to john;
GRANT
```

```
payroll=# alter user suchitra createrole;
ALTER ROLE
```



```
                                List of roles
 Role name |                         Attributes                         | Member of
-----------+------------------------------------------------------------+-----------
 john      |                                                            | {}
 lisa      |                                                            | {}
 postgres  | Superuser, Create role, Create DB, Replication, Bypass RLS | {}
 suchitra  | Create role                                                | {}
 sudipta   |                                                            | {}
 tejass    | Superuser, Create DB                                       | {}
 user3     |                                                            | {}
 user4     |                                                            | {}

~
~
~
~
~
```

****