TT Holding Database

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- ER/EER Diagram

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5.List of Abbreviations

- **ERD:** Entity-Relationship Diagram
- **SQL:** Structured Query Language

6.Abstract

The TT Holding Database is designed to store and manage employee and organization data. A person can work for one or more organizations, and organizations can employ multiple people. The database tracks employment details, including positions, salaries, and jobs of different types The system uses an ER diagram, SQL tables, views, triggers, functions, and procedures to ensure accuracy and security.

7.Chapter 1: Introduction

1.1 Problem Statement

TT Holding needs a database system to manage employees and organizations. A person may work for multiple organizations and hold different positions over time. They must track employment details, salaries, job types, and positions properly.

1.2 Solution

The database will:

- Store a person and the organization details
- Record employment history
- Differentiate between permanent and part-time employees
- Use triggers and functions to manage data updates automatically

1.3 Objective

— Design a database
— Use SQL queries for data management
— Ensure data security

1.4 Scope and Limitations

— The system only stores employment records
— It does not process salaries
— Users will have different levels of access

8.Chapter 2: Literature and Review

2.1 Introduction

Relational databases use tables, relationships, and constraints to maintain accuracy and avoid redundancy**.**

2.2 Review

— Entity-Relationship Model: Helps design clear relationships between data entities.
— Normalization: Organizes data into tables**.**
— Triggers & Procedures: updates salaries or preventing errors automatically.

2.3 Discussion

— A structured database improves work.
— Triggers and functions reduce errors made by human.

9.Chapter 3: Methodology

3.1 Requirements

— Users: Admins, HR managers and employees.
— Data: Persons, organizations, employment records, positions, salaries.

3.2 System Design

The system uses a relational database model**.**

ER/EER DIAGRAM

— Entities: Person, Organization, Employment, Position.
— Relationships: A person can work for multiple organizations.

3.3 IMPLEMENTATION

— Tables are created using SQL.

- Triggers and functions manage automatic updates**.**

3.4 TESTING

- Unit Testing: Tests tables and relationships.
- Integration Testing: Makes sure that data flows correctly between tables.

10.Chapter 4: System Planning

4.1 Feasibility

- Technical: Uses SQL, relational database concepts**.**
- Operational: Easy for HR and employees to use.

4.2 Project Plan

- Design ER Diagram
- Create Tables & Relationships
- Add Advanced SQL Features
- Test and Finish the System

11.Chapter 5: System Analysis

5.1 System Requirements

- The system must store employee and organization details.
- It must track employment history and job positions.

5.2 Data Structure

- Normalization: The database is optimized to avoid duplicate data.
- Security: Different users have different permissions**.**

12.Chapter 6: Conclusion

6.1 Advantages

- Easy employee management
- Accurate tracking of job positions

6.2 Future Enhancement

- Add payroll processing
- Develop a web-based interface

6.3 Potential Benefit

— Less data redundancy
— Secure and well-structured data storage

6.4 Conclusion

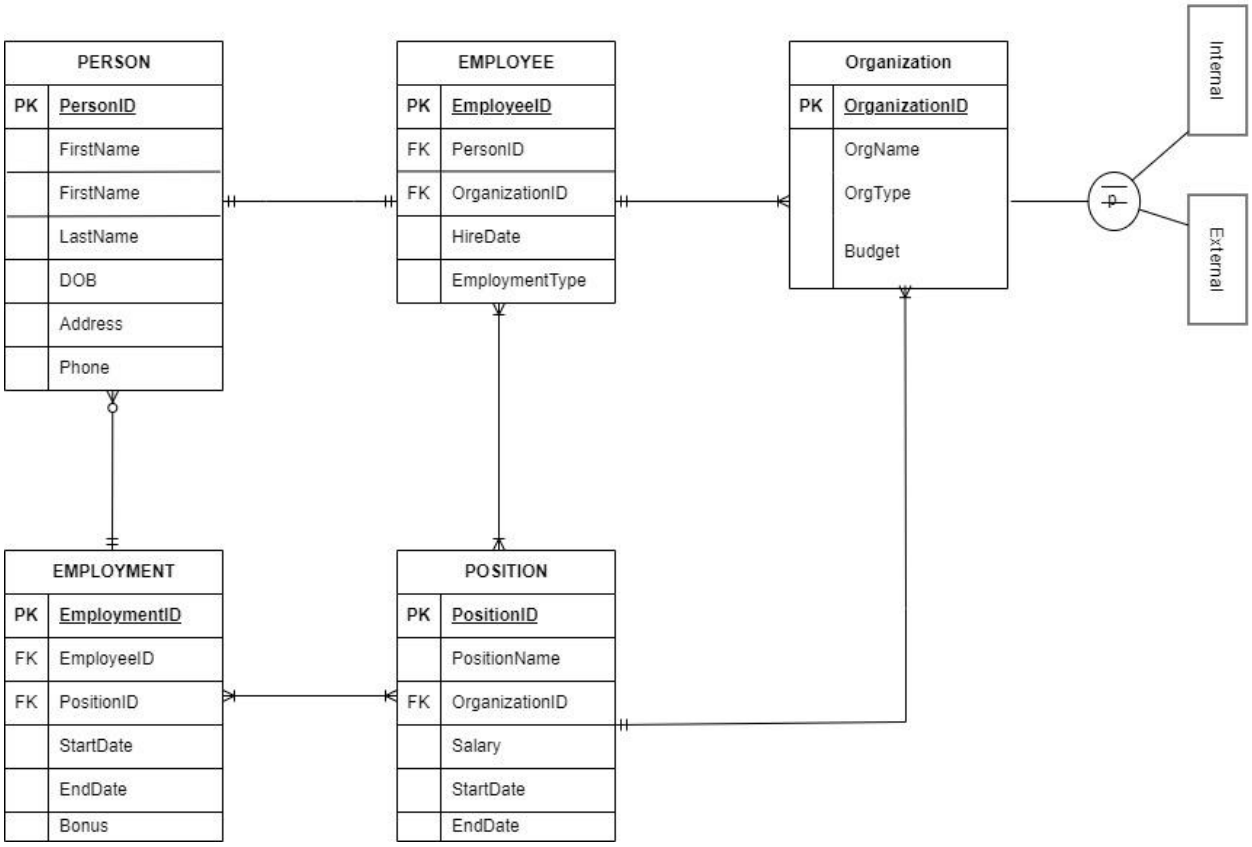
The TT Holding Database is a system for managing employees and organizations. The use of SQL and relational database concepts makes sure that there is efficiency**,** security, and accuracy.

13.References

1. Chen, P. (1976). "Entity-Relationship Model."
2. Elmasri & Navathe (2015). "Fundamentals of Database Systems."
3. Date, C. J. (2019). "Introduction to Database Systems."

14.APPENDICES

Appendix A: ER/EER Diagram



MAPPING

PERSON (PersonID, FirstName, LastName, DOB, Address, Phone)

- PersonID Primary Key (PK)

ORGANIZATION (OrganizationID, OrgName, OrgType, Budget)

- OrganizationID Primary Key (PK)

EMPLOYEE (EmployeeID, PersonID, OrganizationID, HireDate, EmploymentType)

- EmployeeID Primary Key (PK)

- PersonID Foreign Key (FK) references PERSON(PersonID) (1:1 Relationship)

- OrganizationID Foreign Key (FK) references ORGANIZATION(OrganizationID) (N:1 Relationship)

POSITION (PositionID, PositionName, OrganizationID, Salary, StartDate, EndDate)

- PositionID Primary Key (PK)

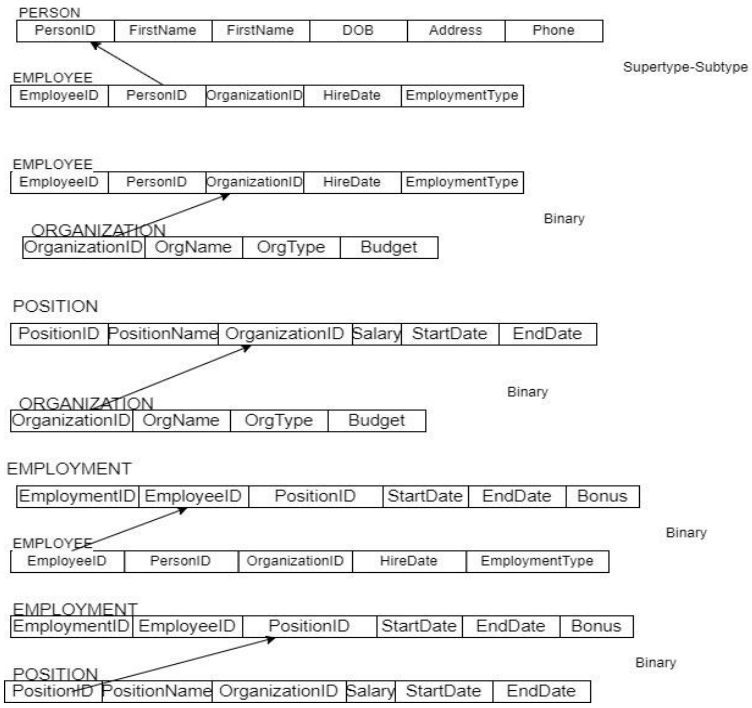
- OrganizationID Foreign Key (FK) references ORGANIZATION(OrganizationID) (N:1 Relationship)

EMPLOYMENT (EmploymentID, EmployeeID, PositionID, StartDate, EndDate, Bonus)

- EmploymentID Primary Key (PK)

- EmployeeID Foreign Key (FK) references EMPLOYEE(EmployeeID) (N:M Relationship)

- PositionID Foreign Key (FK) references POSITION(PositionID) (N:M Relationship)



Appendix B: SQL Code (Tables, Views, Triggers, Functions, Procedures)

1.DATABASE CREATION

Create Database

```
mysql> CREATE DATABASE TT_Holding;
Query OK, 1 row affected (0.00 sec)

mysql> USE TT_Holding;
Database changed
mysql>
```

CREATE TABLE PERSON

```
mysql> CREATE TABLE PERSON (
    ->     PersonID INT AUTO_INCREMENT PRIMARY KEY,
    ->     FirstName VARCHAR(50),
    ->     LastName VARCHAR(50),
    ->     DOB DATE,
    ->     Address VARCHAR(255),
    ->     Phone VARCHAR(20)
    -> );
Query OK, 0 rows affected (0.02 sec)
```

CREATE TABLE ORGANIZATION

```
mysql> CREATE TABLE ORGANIZATION (
    ->     OrganizationID INT PRIMARY KEY,
    ->     OrgName VARCHAR(100),
    ->     OrgType ENUM('Internal', 'External'),
    ->     Budget DECIMAL(15,2)
    -> );
Query OK, 0 rows affected (0.01 sec)
```

CREATE TABLE EMPLOYEE

```
mysql> CREATE TABLE EMPLOYEE (
    ->     EmployeeID INT PRIMARY KEY,
    ->     PersonID INT,
    ->     OrganizationID INT,
    ->     HireDate DATE,
    ->     EmploymentType ENUM('Full-Time', 'Part-Time', 'Contract'),
    ->     FOREIGN KEY (PersonID) REFERENCES PERSON(PersonID),
    ->     FOREIGN KEY (OrganizationID) REFERENCES ORGANIZATION(OrganizationID)
    -> );
Query OK, 0 rows affected (0.02 sec)
```

CREATE TABLE POSITION

```
mysql> CREATE TABLE POSITION (
    ->     PositionID INT KEY,
    ->     PositionName VARCHAR(100),
    ->     OrganizationID INT,
    ->     StartDate DATE,
    ->     EndDate DATE NULL,
    ->     Salary DECIMAL(10,2),
    ->     FOREIGN KEY (OrganizationID) REFERENCES ORGANIZATION(OrganizationID)
    -> );
Query OK, 0 rows affected (0.02 sec)
```

CREATE TABLE EMPLOYMENT

```
mysql> CREATE TABLE EMPLOYMENT (
    ->     EmploymentID INT AUTO_INCREMENT PRIMARY KEY,
    ->     EmployeeID INT,
    ->     PositionID INT,
    ->     StartDate DATE,
    ->     EndDate DATE NULL,
    ->     Bonus DECIMAL(10,2),
    ->     FOREIGN KEY (EmployeeID) REFERENCES EMPLOYEE(EmployeeID),
    ->     FOREIGN KEY (PositionID) REFERENCES `POSITION`(PositionID)
    -> );
Query OK, 0 rows affected (0.02 sec)
```

DATA INSERTIONS INTO EACH TABLE

TABLE PERSON

```
mysql> INSERT INTO PERSON (FirstName, LastName, DOB, Address, Phone) VALUES
    -> ('Thaabe', 'Lekopa', '1988-07-12', 'Maseru, Lesotho', '22334455'),
    -> ('Makara', 'Matooane', '1992-05-24', 'Teyateyaneng, Lesotho', '22111222'),
    -> ('Lerato', 'Mokoena', '1995-03-15', 'Hlotse, Lesotho', '22556677'),
    -> ('Posholi', 'Thamae', '1990-08-05', 'Mohale\'s Hoek, Lesotho', '22778899'),
    -> ('Palesa', 'Ntlama', '1987-02-17', 'Quthing, Lesotho', '22445566'),
    -> ('Mosiuoa', 'Mphuthing', '1991-10-10', 'Berea, Lesotho', '22335544'),
    -> ('Nthabiseng', 'Ramakatsa', '1993-08-25', 'Mafeteng, Lesotho', '22119988'),
    -> ('Teboho', 'Sello', '1985-06-30', 'Mokhotlong, Lesotho', '22667788'),
    -> ('Neo', 'Khoabane', '1997-12-01', 'Leribe, Lesotho', '22991122'),
    -> ('Kopano', 'Tsepo', '1996-04-22', 'Butha-Buthe, Lesotho', '22558899'),
    -> ('Mpho', 'Tlohang', '1994-09-14', 'Qacha\'s Nek, Lesotho', '22889977');  --
Query OK, 11 rows affected (0.01 sec)
```

```
mysql> SELECT * FROM PERSON;
+----------+------------+-----------+------------+------------------------+----------+
| PersonID | FirstName  | LastName  | DOB        | Address                | Phone    |
+----------+------------+-----------+------------+------------------------+----------+
|        1 | Thaabe     | Lekopa    | 1988-07-12 | Maseru, Lesotho        | 22334455 |
|        2 | Makara     | Matooane  | 1992-05-24 | Teyateyaneng, Lesotho  | 22111222 |
|        3 | Lerato     | Mokoena   | 1995-03-15 | Hlotse, Lesotho        | 22556677 |
|        4 | Posholi    | Thamae    | 1990-08-05 | Mohale's Hoek, Lesotho | 22778899 |
|        5 | Palesa     | Ntlama    | 1987-02-17 | Quthing, Lesotho       | 22445566 |
|        6 | Mosiuoa    | Mphuthing | 1991-10-10 | Berea, Lesotho         | 22335544 |
|        7 | Nthabiseng | Ramakatsa | 1993-08-25 | Mafeteng, Lesotho      | 22119988 |
|        8 | Teboho     | Sello     | 1985-06-30 | Mokhotlong, Lesotho    | 22667788 |
|        9 | Neo        | Khoabane  | 1997-12-01 | Leribe, Lesotho        | 22991122 |
|       10 | Kopano     | Tsepo     | 1996-04-22 | Butha-Buthe, Lesotho   | 22558899 |
|       11 | Mpho       | Tlohang   | 1994-09-14 | Qacha's Nek, Lesotho   | 22889977 |
+----------+------------+-----------+------------+------------------------+----------+
11 rows in set (0.00 sec)
```

TABLE ORGANIZATION

```
mysql> INSERT INTO ORGANIZATION (OrganizationID, OrgName, OrgType, Budget) VALUES
    -> (1, 'TT Solutions', 'Internal', 500000.00),
    -> (2, 'Lesotho Tech Hub', 'External', 300000.00),
    -> (3, 'CloudWare Inc.', 'Internal', 450000.00),
    -> (4, 'NextGen IT', 'External', 200000.00),
    -> (5, 'CyberSec Labs', 'Internal', 600000.00),
    -> (6, 'Smart Systems', 'External', 350000.00),
    -> (7, 'AI Innovators', 'Internal', 550000.00),
    -> (8, 'Blockchain Africa', 'External', 250000.00),
    -> (9, 'DataForce Ltd.', 'Internal', 400000.00),
    -> (10, 'SoftTech Global', 'External', 320000.00),
    -> (11, 'Innovate Digital', 'Internal', 480000.00);
Query OK, 11 rows affected (0.01 sec)
Records: 11  Duplicates: 0  Warnings: 0
```

```
mysql> SELECT * FROM ORGANIZATION;
+----------------+-------------------+----------+-----------+
| OrganizationID | OrgName           | OrgType  | Budget    |
+----------------+-------------------+----------+-----------+
|              1 | TT Solutions      | Internal | 500000.00 |
|              2 | Lesotho Tech Hub  | External | 300000.00 |
|              3 | CloudWare Inc.    | Internal | 450000.00 |
|              4 | NextGen IT        | External | 200000.00 |
|              5 | CyberSec Labs     | Internal | 600000.00 |
|              6 | Smart Systems     | External | 350000.00 |
|              7 | AI Innovators     | Internal | 550000.00 |
|              8 | Blockchain Africa | External | 250000.00 |
|              9 | DataForce Ltd.    | Internal | 400000.00 |
|             10 | SoftTech Global   | External | 320000.00 |
|             11 | Innovate Digital  | Internal | 480000.00 |
+----------------+-------------------+----------+-----------+
11 rows in set (0.00 sec)
```

TABLE EMPLOYEE

```
mysql> INSERT INTO EMPLOYEE (EmployeeID, PersonID, OrganizationID, HireDate, EmploymentType) VALUES
    -> (1, 1, 1, '2023-01-10', 'Full-Time'),
    -> (2, 2, 2, '2022-05-21', 'Part-Time'),
    -> (3, 3, 3, '2021-07-30', 'Contract'),
    -> (4, 4, 4, '2020-10-15', 'Full-Time'),
    -> (5, 5, 5, '2019-12-01', 'Part-Time'),
    -> (6, 6, 6, '2018-03-25', 'Full-Time'),
    -> (7, 7, 7, '2017-06-18', 'Contract'),
    -> (8, 8, 8, '2016-11-22', 'Full-Time'),
    -> (9, 9, 9, '2015-08-19', 'Part-Time'),
    -> (10, 10, 10, '2014-09-05', 'Contract'),
    -> (11, 11, 11, '2013-04-30', 'Full-Time');
Query OK, 11 rows affected (0.01 sec)
Records: 11  Duplicates: 0  Warnings: 0
```

```
mysql> SELECT * FROM EMPLOYEE;
+------------+----------+----------------+------------+----------------+
| EmployeeID | PersonID | OrganizationID | HireDate   | EmploymentType |
+------------+----------+----------------+------------+----------------+
|          1 |        1 |              1 | 2023-01-10 | Full-Time      |
|          2 |        2 |              2 | 2022-05-21 | Part-Time      |
|          3 |        3 |              3 | 2021-07-30 | Contract       |
|          4 |        4 |              4 | 2020-10-15 | Full-Time      |
|          5 |        5 |              5 | 2019-12-01 | Part-Time      |
|          6 |        6 |              6 | 2018-03-25 | Full-Time      |
|          7 |        7 |              7 | 2017-06-18 | Contract       |
|          8 |        8 |              8 | 2016-11-22 | Full-Time      |
|          9 |        9 |              9 | 2015-08-19 | Part-Time      |
|         10 |       10 |             10 | 2014-09-05 | Contract       |
|         11 |       11 |             11 | 2013-04-30 | Full-Time      |
+------------+----------+----------------+------------+----------------+
11 rows in set (0.00 sec)
```

CREATE TABLE POSITION

```
mysql> INSERT INTO `POSITION` (PositionID, PositionName, OrganizationID, StartDate, EndDate, Salary) VALUES
    -> (1, 'Software Engineer', 1, '2023-01-10', NULL, 75000.00),
    -> (2, 'Network Administrator', 2, '2022-06-15', NULL, 65000.00),
    -> (3, 'Data Analyst', 3, '2021-07-01', NULL, 60000.00),
    -> (4, 'Cybersecurity Specialist', 4, '2020-03-10', NULL, 80000.00),
    -> (5, 'Project Manager', 5, '2019-12-05', NULL, 90000.00),
    -> (6, 'AI Developer', 6, '2018-10-20', NULL, 85000.00),
    -> (7, 'DevOps Engineer', 7, '2017-09-30', NULL, 70000.00),
    -> (8, 'Blockchain Developer', 8, '2016-08-25', NULL, 78000.00),
    -> (9, 'System Administrator', 9, '2015-05-11', NULL, 72000.00),
    -> (10, 'UX/UI Designer', 10, '2014-04-19', NULL, 68000.00),
    -> (11, 'Full Stack Developer', 11, '2013-02-10', NULL, 77000.00);
Query OK, 11 rows affected (0.01 sec)
Records: 11  Duplicates: 0  Warnings: 0

mysql> SELECT * FROM POSITION;
+------------+--------------------------+----------------+------------+---------+----------+
| PositionID | PositionName             | OrganizationID | StartDate  | EndDate | Salary   |
+------------+--------------------------+----------------+------------+---------+----------+
|          1 | Software Engineer        |              1 | 2023-01-10 | NULL    | 75000.00 |
|          2 | Network Administrator    |              2 | 2022-06-15 | NULL    | 65000.00 |
|          3 | Data Analyst             |              3 | 2021-07-01 | NULL    | 60000.00 |
|          4 | Cybersecurity Specialist |              4 | 2020-03-10 | NULL    | 80000.00 |
|          5 | Project Manager          |              5 | 2019-12-05 | NULL    | 90000.00 |
|          6 | AI Developer             |              6 | 2018-10-20 | NULL    | 85000.00 |
|          7 | DevOps Engineer          |              7 | 2017-09-30 | NULL    | 70000.00 |
|          8 | Blockchain Developer     |              8 | 2016-08-25 | NULL    | 78000.00 |
|          9 | System Administrator     |              9 | 2015-05-11 | NULL    | 72000.00 |
|         10 | UX/UI Designer           |             10 | 2014-04-19 | NULL    | 68000.00 |
|         11 | Full Stack Developer     |             11 | 2013-02-10 | NULL    | 77000.00 |
+------------+--------------------------+----------------+------------+---------+----------+
11 rows in set (0.00 sec)
```

CREATE TABLE EMPLOYMENT

```
mysql> INSERT INTO EMPLOYMENT (EmploymentID, EmployeeID, PositionID, StartDate, EndDate, Bonus) VALUES
    -> (1, 1, 1, '2023-01-10', NULL, 5000.00),
    -> (2, 2, 2, '2022-06-15', NULL, 4500.00),
    -> (3, 3, 3, '2021-07-01', NULL, 4000.00),
    -> (4, 4, 4, '2020-03-10', NULL, 6000.00),
    -> (5, 5, 5, '2019-12-05', NULL, 7000.00),
    -> (6, 6, 6, '2018-10-20', NULL, 6500.00),
    -> (7, 7, 7, '2017-09-30', NULL, 5500.00),
    -> (8, 8, 8, '2016-08-25', NULL, 6200.00),
    -> (9, 9, 9, '2015-05-11', NULL, 5800.00),
    -> (10, 10, 10, '2014-04-19', NULL, 5300.00),
    -> (11, 11, 11, '2013-02-10', NULL, 6000.00);
Query OK, 11 rows affected (0.01 sec)
Records: 11  Duplicates: 0  Warnings: 0

mysql> SELECT * FROM EMPLOYMENT;
+--------------+------------+------------+------------+---------+---------+
| EmploymentID | EmployeeID | PositionID | StartDate  | EndDate | Bonus   |
+--------------+------------+------------+------------+---------+---------+
|            1 |          1 |          1 | 2023-01-10 | NULL    | 5000.00 |
|            2 |          2 |          2 | 2022-06-15 | NULL    | 4500.00 |
|            3 |          3 |          3 | 2021-07-01 | NULL    | 4000.00 |
|            4 |          4 |          4 | 2020-03-10 | NULL    | 6000.00 |
|            5 |          5 |          5 | 2019-12-05 | NULL    | 7000.00 |
|            6 |          6 |          6 | 2018-10-20 | NULL    | 6500.00 |
|            7 |          7 |          7 | 2017-09-30 | NULL    | 5500.00 |
|            8 |          8 |          8 | 2016-08-25 | NULL    | 6200.00 |
|            9 |          9 |          9 | 2015-05-11 | NULL    | 5800.00 |
|           10 |         10 |         10 | 2014-04-19 | NULL    | 5300.00 |
|           11 |         11 |         11 | 2013-02-10 | NULL    | 6000.00 |
+--------------+------------+------------+------------+---------+---------+
11 rows in set (0.00 sec)
```

2.CREATION OF VIEWS 2 EACH TABLE

TABLE PERSON VIEWS

1.Views all person’s details

```
mysql> CREATE VIEW PersonDetails AS
    -> SELECT * FROM PERSON;
Query OK, 0 rows affected (0.01 sec)
```

```
mysql> SELECT * FROM PersonDetails;
+----------+-----------+-----------+------------+------------------------+----------+
| PersonID | FirstName | LastName  | DOB        | Address                | Phone    |
+----------+-----------+-----------+------------+------------------------+----------+
|        1 | Thaabe    | Lekopa    | 1988-07-12 | Maseru, Lesotho        | 22334455 |
|        2 | Makara    | Matooane  | 1992-05-24 | Teyateyaneng, Lesotho  | 22111222 |
|        3 | Lerato    | Mokoena   | 1995-03-15 | Hlotse, Lesotho        | 22556677 |
|        4 | Posholi   | Thamae    | 1990-08-05 | Mohale's Hoek, Lesotho | 22778899 |
|        5 | Palesa    | Ntlama    | 1987-02-17 | Quthing, Lesotho       | 22445566 |
|        6 | Mosiuoa   | Mphuthing | 1991-10-10 | Berea, Lesotho         | 22335544 |
|        7 | Nthabiseng| Ramakatsa | 1993-08-25 | Mafeteng, Lesotho      | 22119988 |
|        8 | Teboho    | Sello     | 1985-06-30 | Mokhotlong, Lesotho    | 22667788 |
|        9 | Neo       | Khoabane  | 1997-12-01 | Leribe, Lesotho        | 22991122 |
|       10 | Kopano    | Tsepo     | 1996-04-22 | Butha-Buthe, Lesotho   | 22558899 |
|       11 | Mpho      | Tlohang   | 1994-09-14 | Qacha's Nek, Lesotho   | 22889977 |
+----------+-----------+-----------+------------+------------------------+----------+
11 rows in set (0.00 sec)
```

2. Views all person’s contacts

```
mysql> CREATE VIEW PersonContact AS
    -> SELECT FirstName, LastName, Phone FROM PERSON;
Query OK, 0 rows affected (0.01 sec)
```

```
mysql> SELECT * FROM PersonContact;
+------------+-----------+----------+
| FirstName  | LastName  | Phone    |
+------------+-----------+----------+
| Thaabe     | Lekopa    | 22334455 |
| Makara     | Matooane  | 22111222 |
| Lerato     | Mokoena   | 22556677 |
| Posholi    | Thamae    | 22778899 |
| Palesa     | Ntlama    | 22445566 |
| Mosiuoa    | Mphuthing | 22335544 |
| Nthabiseng | Ramakatsa | 22119988 |
| Teboho     | Sello     | 22667788 |
| Neo        | Khoabane  | 22991122 |
| Kopano     | Tsepo     | 22558899 |
| Mpho       | Tlohang   | 22889977 |
+------------+-----------+----------+
11 rows in set (0.01 sec)
```

TABLE ORGANIZATION VIEWS

1.view Organization where orgType = ‘Internal’

```
mysql> CREATE VIEW InternalOrganizations AS
    -> SELECT * FROM ORGANIZATION WHERE OrgType = 'Internal';
Query OK, 0 rows affected (0.01 sec)
```

```
mysql> SELECT * FROM InternalOrganizations;
+----------------+------------------+----------+-----------+
| OrganizationID | OrgName          | OrgType  | Budget    |
+----------------+------------------+----------+-----------+
|              1 | TT Solutions     | Internal | 500000.00 |
|              3 | CloudWare Inc.   | Internal | 450000.00 |
|              5 | CyberSec Labs    | Internal | 600000.00 |
|              7 | AI Innovators    | Internal | 550000.00 |
|              9 | DataForce Ltd.   | Internal | 400000.00 |
|             11 | Innovate Digital | Internal | 480000.00 |
+----------------+------------------+----------+-----------+
6 rows in set (0.00 sec)
```

2.view Organizations Budgets

```
mysql>
mysql> CREATE VIEW OrganizationBudgets AS
    -> SELECT OrgName, Budget FROM ORGANIZATION;
Query OK, 0 rows affected (0.01 sec)
```

```
mysql> SELECT * FROM OrganizationBudgets;
+------------------+-----------+
| OrgName          | Budget    |
+------------------+-----------+
| TT Solutions     | 500000.00 |
| Lesotho Tech Hub | 300000.00 |
| CloudWare Inc.   | 450000.00 |
| NextGen IT       | 200000.00 |
| CyberSec Labs    | 600000.00 |
| Smart Systems    | 350000.00 |
| AI Innovators    | 550000.00 |
| Blockchain Africa| 250000.00 |
| DataForce Ltd.   | 400000.00 |
| SoftTech Global  | 320000.00 |
| Innovate Digital | 480000.00 |
+------------------+-----------+
11 rows in set (0.00 sec)
```

TABLE EMPLOYEE VIEWS

1.views Employee where EmploymentType = 'Full-Time’

```
mysql> CREATE VIEW FullTimeEmployees AS
    -> SELECT * FROM EMPLOYEE WHERE EmploymentType = 'Full-Time';
Query OK, 0 rows affected (0.01 sec)
```

```
mysql> SELECT * FROM FullTimeEmployees;
+------------+----------+----------------+------------+----------------+
| EmployeeID | PersonID | OrganizationID | HireDate   | EmploymentType |
+------------+----------+----------------+------------+----------------+
|          1 |        1 |              1 | 2023-01-10 | Full-Time      |
|          4 |        4 |              4 | 2020-10-15 | Full-Time      |
|          6 |        6 |              6 | 2018-03-25 | Full-Time      |
|          8 |        8 |              8 | 2016-11-22 | Full-Time      |
|         11 |       11 |             11 | 2013-04-30 | Full-Time      |
+------------+----------+----------------+------------+----------------+
5 rows in set (0.00 sec)
```

2.views Employee where EmploymentType = 'Part-Time’

```
mysql>
mysql> CREATE VIEW PartTimeEmployees AS
    -> SELECT * FROM EMPLOYEE WHERE EmploymentType = 'Part-Time';
Query OK, 0 rows affected (0.01 sec)
```

```
mysql> SELECT * FROM PartTimeEmployees;
+------------+----------+----------------+------------+----------------+
| EmployeeID | PersonID | OrganizationID | HireDate   | EmploymentType |
+------------+----------+----------------+------------+----------------+
|          2 |        2 |              2 | 2022-05-21 | Part-Time      |
|          5 |        5 |              5 | 2019-12-01 | Part-Time      |
|          9 |        9 |              9 | 2015-08-19 | Part-Time      |
+------------+----------+----------------+------------+----------------+
3 rows in set (0.00 sec)
```

TABLE POSITION VIEWS

1.views from Position where Salary is > 60000

```
mysql> CREATE VIEW HighSalaryPositions AS
    -> SELECT * FROM POSITION WHERE Salary > 60000;
Query OK, 0 rows affected (0.01 sec)
```

```
mysql> SELECT * FROM HighSalaryPositions;
+------------+-------------------------+----------------+------------+---------+----------+
| PositionID | PositionName            | OrganizationID | StartDate  | EndDate | Salary   |
+------------+-------------------------+----------------+------------+---------+----------+
|          1 | Software Engineer       |              1 | 2023-01-10 | NULL    | 75000.00 |
|          2 | Network Administrator   |              2 | 2022-06-15 | NULL    | 65000.00 |
|          4 | Cybersecurity Specialist|              4 | 2020-03-10 | NULL    | 80000.00 |
|          5 | Project Manager         |              5 | 2019-12-05 | NULL    | 90000.00 |
|          6 | AI Developer            |              6 | 2018-10-20 | NULL    | 85000.00 |
|          7 | DevOps Engineer         |              7 | 2017-09-30 | NULL    | 70000.00 |
|          8 | Blockchain Developer    |              8 | 2016-08-25 | NULL    | 78000.00 |
|          9 | System Administrator    |              9 | 2015-05-11 | NULL    | 72000.00 |
|         10 | UX/UI Designer          |             10 | 2014-04-19 | NULL    | 68000.00 |
|         11 | Full Stack Developer    |             11 | 2013-02-10 | NULL    | 77000.00 |
+------------+-------------------------+----------------+------------+---------+----------+
10 rows in set (0.01 sec)
```

2.views from Position where EndDate is NULL

```
mysql>
mysql> CREATE VIEW OpenPositions AS
    -> SELECT * FROM POSITION WHERE EndDate IS NULL;
Query OK, 0 rows affected (0.01 sec)
```

```
mysql> SELECT * FROM OpenPositions;
+------------+-------------------------+----------------+------------+---------+----------+
| PositionID | PositionName            | OrganizationID | StartDate  | EndDate | Salary   |
+------------+-------------------------+----------------+------------+---------+----------+
|          1 | Software Engineer       |              1 | 2023-01-10 | NULL    | 75000.00 |
|          2 | Network Administrator   |              2 | 2022-06-15 | NULL    | 65000.00 |
|          3 | Data Analyst            |              3 | 2021-07-01 | NULL    | 60000.00 |
|          4 | Cybersecurity Specialist |              4 | 2020-03-10 | NULL    | 80000.00 |
|          5 | Project Manager         |              5 | 2019-12-05 | NULL    | 90000.00 |
|          6 | AI Developer            |              6 | 2018-10-20 | NULL    | 85000.00 |
|          7 | DevOps Engineer         |              7 | 2017-09-30 | NULL    | 70000.00 |
|          8 | Blockchain Developer    |              8 | 2016-08-25 | NULL    | 78000.00 |
|          9 | System Administrator    |              9 | 2015-05-11 | NULL    | 72000.00 |
|         10 | UX/UI Designer          |             10 | 2014-04-19 | NULL    | 68000.00 |
|         11 | Full Stack Developer    |             11 | 2013-02-10 | NULL    | 77000.00 |
+------------+-------------------------+----------------+------------+---------+----------+
11 rows in set (0.00 sec)
```

TABLE EMPLOYMENT VIEWS

1.views from Employment where EndDate is NULL

```
mysql> CREATE VIEW OngoingEmployment AS
    -> SELECT * FROM EMPLOYMENT WHERE EndDate IS NULL;
Query OK, 0 rows affected (0.01 sec)
```

```
mysql> SELECT * FROM OngoingEmployment;
+--------------+------------+------------+------------+---------+---------+
| EmploymentID | EmployeeID | PositionID | StartDate  | EndDate | Bonus   |
+--------------+------------+------------+------------+---------+---------+
|            1 |          1 |          1 | 2023-01-10 | NULL    | 5000.00 |
|            2 |          2 |          2 | 2022-06-15 | NULL    | 4500.00 |
|            3 |          3 |          3 | 2021-07-01 | NULL    | 4000.00 |
|            4 |          4 |          4 | 2020-03-10 | NULL    | 6000.00 |
|            5 |          5 |          5 | 2019-12-05 | NULL    | 7000.00 |
|            6 |          6 |          6 | 2018-10-20 | NULL    | 6500.00 |
|            7 |          7 |          7 | 2017-09-30 | NULL    | 5500.00 |
|            8 |          8 |          8 | 2016-08-25 | NULL    | 6200.00 |
|            9 |          9 |          9 | 2015-05-11 | NULL    | 5800.00 |
|           10 |         10 |         10 | 2014-04-19 | NULL    | 5300.00 |
|           11 |         11 |         11 | 2013-02-10 | NULL    | 6000.00 |
+--------------+------------+------------+------------+---------+---------+
11 rows in set (0.01 sec)
```

2.views from Employment where Bonus is >0

```
mysql>
mysql> CREATE VIEW BonusEligible AS
    -> SELECT * FROM EMPLOYMENT WHERE Bonus > 0;
Query OK, 0 rows affected (0.01 sec)
```

```
mysql> SELECT * FROM BonusEligible;
+--------------+------------+------------+------------+---------+---------+
| EmploymentID | EmployeeID | PositionID | StartDate  | EndDate | Bonus   |
+--------------+------------+------------+------------+---------+---------+
|            1 |          1 |          1 | 2023-01-10 | NULL    | 5000.00 |
|            2 |          2 |          2 | 2022-06-15 | NULL    | 4500.00 |
|            3 |          3 |          3 | 2021-07-01 | NULL    | 4000.00 |
|            4 |          4 |          4 | 2020-03-10 | NULL    | 6000.00 |
|            5 |          5 |          5 | 2019-12-05 | NULL    | 7000.00 |
|            6 |          6 |          6 | 2018-10-20 | NULL    | 6500.00 |
|            7 |          7 |          7 | 2017-09-30 | NULL    | 5500.00 |
|            8 |          8 |          8 | 2016-08-25 | NULL    | 6200.00 |
|            9 |          9 |          9 | 2015-05-11 | NULL    | 5800.00 |
|           10 |         10 |         10 | 2014-04-19 | NULL    | 5300.00 |
|           11 |         11 |         11 | 2013-02-10 | NULL    | 6000.00 |
+--------------+------------+------------+------------+---------+---------+
11 rows in set (0.00 sec)
```

3.CREATION OF TRIGGERS

INSERT TRIGGERS

1.CREATION OF PERSON INSERT TRIGGER (2)

```
mysql> DELIMITER //
mysql>
mysql> CREATE TRIGGER after_person_insert
    -> AFTER INSERT ON PERSON
    -> FOR EACH ROW
    -> BEGIN
    ->     INSERT INTO EMPLOYEE (PersonID, OrganizationID, HireDate, EmploymentType)
    ->     VALUES (NEW.PersonID, 1, CURDATE(), 'Full-Time');
    -> END;
    -> //
Query OK, 0 rows affected (0.02 sec)
```

```
mysql> SHOW TRIGGERS;
+---------------------+--------+--------+------------------------------------------------------------------------
----------------+--------+---------+---------------------------------------------------------------+----------------+----------------------+----------------------+--
------------------+
| Trigger             | Event  | Table  | Statement
                | Timing | Created | sql_mode                                                      | Definer        | character_set_client | collation_connection | D
atabase Collation |
+---------------------+--------+--------+------------------------------------------------------------------------
----------------+--------+---------+---------------------------------------------------------------+----------------+----------------------+----------------------+--
------------------+
| after_person_insert | INSERT | person | BEGIN
    INSERT INTO EMPLOYEE (PersonID, OrganizationID, HireDate, EmploymentType)
    VALUES (NEW.PersonID, 1, CURDATE(), 'Full-Time');
END | AFTER  | NULL    | STRICT_TRANS_TABLES,NO_AUTO_CREATE_USER,NO_ENGINE_SUBSTITUTION | root@localhost | latin1               | latin1_swedish_ci    | latin1_swedish
_ci  |
+---------------------+--------+--------+------------------------------------------------------------------------
----------------+--------+---------+---------------------------------------------------------------+----------------+----------------------+----------------------+--
------------------+
1 row in set (0.00 sec)
```

2.

```
mysql> CREATE TRIGGER after_employee_insert
    -> AFTER INSERT ON EMPLOYEE
    -> FOR EACH ROW
    -> BEGIN
    ->     INSERT INTO EMPLOYMENT (EmploymentID, EmployeeID, PositionID, StartDate, Bonus)
    ->     VALUES (NULL, NEW.EmployeeID, 1, CURDATE(), 500.00);
    -> END;
    -> //
Query OK, 0 rows affected (0.02 sec)

mysql>
mysql> DELIMITER ;
mysql>
```

```
mysql> SHOW TRIGGERS;
+-----------------------+--------+----------+--------------------------------------------------------------------------------------------------
---------------------------+--------+---------+-----------------------------------------------------------------+----------------+----------------------+----------
---------+-------------------+
| Trigger               | Event  | Table    | Statement
                           | Timing | Created | sql_mode                                                          | Definer        | character_set_client | collation_c
onnection | Database Collation |
+-----------------------+--------+----------+--------------------------------------------------------------------------------------------------
---------------------------+--------+---------+-----------------------------------------------------------------+----------------+----------------------+----------
---------+-------------------+
| after_employee_insert | INSERT | employee | BEGIN
    INSERT INTO EMPLOYMENT (EmploymentID, EmployeeID, PositionID, StartDate, Bonus)
    VALUES (NULL, NEW.EmployeeID, 1, CURDATE(), 500.00);
END | AFTER  | NULL    | STRICT_TRANS_TABLES,NO_AUTO_CREATE_USER,NO_ENGINE_SUBSTITUTION | root@localhost | latin1               | latin1_swedish_ci    | latin1_swedish
_ci  |
| after_person_insert   | INSERT | person   | BEGIN
    INSERT INTO EMPLOYEE (PersonID, OrganizationID, HireDate, EmploymentType)
    VALUES (NEW.PersonID, 1, CURDATE(), 'Full-Time');
END          | AFTER  | NULL    | STRICT_TRANS_TABLES,NO_AUTO_CREATE_USER,NO_ENGINE_SUBSTITUTION | root@localhost | latin1               | latin1_swedish_ci    | latin
1_swedish_ci  |
+-----------------------+--------+----------+--------------------------------------------------------------------------------------------------
---------------------------+--------+---------+-----------------------------------------------------------------+----------------+----------------------+----------
---------+-------------------+
2 rows in set (0.01 sec)
```

UPDATE TRIGGERS

1.UPDATE TRIGGER ON POSITION TABLE

```
mysql> CREATE TRIGGER update_salary_bonus
    -> AFTER UPDATE ON POSITION
    -> FOR EACH ROW
    -> BEGIN
    ->     UPDATE EMPLOYMENT SET Bonus = Bonus + 1000 WHERE PositionID = NEW.PositionID;
    -> END;
    -> //
Query OK, 0 rows affected (0.01 sec)
```

2.UPDATE TRIGGER ON ORGANIZATION TABLE

```
mysql> CREATE TRIGGER update_organization_budget
    -> AFTER UPDATE ON ORGANIZATION
    -> FOR EACH ROW
    -> BEGIN
    ->     IF NEW.Budget < OLD.Budget THEN
    ->         UPDATE POSITION SET Salary = Salary * 0.95 WHERE OrganizationID = NEW.OrganizationID;
    ->     END IF;
    -> END;
    -> //
Query OK, 0 rows affected (0.01 sec)
```

DELETE TRIGGERS

1.DELETE TRIGGER ON PERSON TABLE

```
mysql> CREATE TRIGGER delete_employee
    -> AFTER DELETE ON PERSON
    -> FOR EACH ROW
    -> BEGIN
    ->     DELETE FROM EMPLOYEE WHERE PersonID = OLD.PersonID;
    -> END;
    -> //
Query OK, 0 rows affected (0.02 sec)
```

2. DELETE TRIGGER ON POSITION TABLE

```
mysql> CREATE TRIGGER delete_position
    -> AFTER DELETE ON POSITION
    -> FOR EACH ROW
    -> BEGIN
    ->     DELETE FROM EMPLOYMENT WHERE PositionID = OLD.PositionID;
    -> END;
    -> //
Query OK, 0 rows affected (0.03 sec)
```

4.FUNCTIONS

1. Function to Get Full Address

```
mysql> DELIMITER //
mysql> CREATE FUNCTION GetFullAddress(PersonID INT) RETURNS VARCHAR(255)
    -> DETERMINISTIC
    -> BEGIN
    ->     DECLARE full_address VARCHAR(255);
    ->     SELECT Address INTO full_address FROM PERSON WHERE PersonID = PersonID;
    ->     RETURN full_address;
    -> END;
    -> //
Query OK, 0 rows affected (0.00 sec)

mysql> DELIMITER ;
mysql>
```

```
mysql> SHOW CREATE FUNCTION GetFullAddress;
+----------------+-----------------------------------------------------------------+--------------------------------------------
---------------------------------------------------------------------------------------------------------------------------------
-------------------------+----------------------+----------------------+--------------------+
| Function       | sql_mode                                                        | Create Function

                         | character_set_client | collation_connection | Database Collation |
+----------------+-----------------------------------------------------------------+--------------------------------------------
---------------------------------------------------------------------------------------------------------------------------------
-------------------------+----------------------+----------------------+--------------------+
| GetFullAddress | STRICT_TRANS_TABLES,NO_AUTO_CREATE_USER,NO_ENGINE_SUBSTITUTION | CREATE DEFINER=`root`@`localhost` FUNCTION `GetFullAddress`(PersonID INT) RETURNS v
archar(255) CHARSET latin1
    DETERMINISTIC
BEGIN
    DECLARE full_address VARCHAR(255);
    SELECT Address INTO full_address FROM PERSON WHERE PersonID = PersonID;
    RETURN full_address;
END | latin1               | latin1_swedish_ci    | latin1_swedish_ci  |
+----------------+-----------------------------------------------------------------+--------------------------------------------
---------------------------------------------------------------------------------------------------------------------------------
-------------------------+----------------------+----------------------+--------------------+
1 row in set (0.00 sec)
```

2. Function to Calculate Organization Total Budget

```
mysql> DELIMITER //
mysql> CREATE FUNCTION GetTotalBudget()
    -> RETURNS DECIMAL(15,2) DETERMINISTIC
    -> BEGIN
    ->     DECLARE total DECIMAL(15,2);
    ->     SELECT SUM(Budget) INTO total FROM ORGANIZATION;
    ->     RETURN total;
    -> END;
    -> //
Query OK, 0 rows affected (0.01 sec)

mysql> DELIMITER ;
```

```
mysql> SHOW CREATE FUNCTION GetTotalBudget;
+----------------+----------+--------------------+----------------------+----------------------+
| Function       | sql_mode | Create Function    | character_set_client | collation_connection | Database Collation |
+----------------+----------+--------------------+----------------------+----------------------+
| GetTotalBudget | STRICT_TRANS_TABLES,NO_AUTO_CREATE_USER,NO_ENGINE_SUBSTITUTION | CREATE DEFINER=`root`@`localhost` FUNCTION `GetTotalBudget`() RETURNS decimal(15,2)
    DETERMINISTIC
BEGIN
    DECLARE total DECIMAL(15,2);
    SELECT SUM(Budget) INTO total FROM ORGANIZATION;
    RETURN total;
END | latin1 | latin1_swedish_ci | latin1_swedish_ci |
+----------------+----------+--------------------+----------------------+----------------------+
1 row in set (0.00 sec)
```

5.PROCEDURES

1.PROCEDURE TO INSERT DATA INTO EMPLOYEE TABLE

```
mysql> DELIMITER //
mysql> CREATE PROCEDURE InsertEmployee(IN pID INT, IN oID INT, IN hDate DATE, IN eType ENUM('Full-Time', 'Part-Time', 'Contract'))
    -> BEGIN
    ->     INSERT INTO EMPLOYEE (PersonID, OrganizationID, HireDate, EmploymentType)
    ->     VALUES (pID, oID, hDate, eType);
    -> END;
    -> //
Query OK, 0 rows affected (0.01 sec)

mysql> DELIMITER ;
mysql>
```

```
mysql> SHOW CREATE PROCEDURE InsertEmployee;
+----------------+----------+--------------------+----------------------+----------------------+
| Procedure      | sql_mode | Create Procedure   | character_set_client | collation_connection | Database Collation |
+----------------+----------+--------------------+----------------------+----------------------+
| InsertEmployee | STRICT_TRANS_TABLES,NO_AUTO_CREATE_USER,NO_ENGINE_SUBSTITUTION | CREATE DEFINER=`root`@`localhost` PROCEDURE `InsertEmployee`(IN pID INT, IN oID INT, IN hDate DATE, IN eType ENUM('Full-Time', 'Part-Time', 'Contract'))
BEGIN
    INSERT INTO EMPLOYEE (PersonID, OrganizationID, HireDate, EmploymentType)
    VALUES (pID, oID, hDate, eType);
END | latin1 | latin1_swedish_ci | latin1_swedish_ci |
+----------------+----------+--------------------+----------------------+----------------------+
1 row in set (0.00 sec)
```

2.PROCEDURE TO UPDATE SALARY OF EMPLOYEEs

```
mysql> DELIMITER //
mysql> CREATE PROCEDURE UpdateSalary(IN posID INT, IN newSalary DECIMAL(10,2))
    -> BEGIN
    ->     UPDATE POSITION SET Salary = newSalary WHERE PositionID = posID;
    -> END;
    -> //
Query OK, 0 rows affected (0.00 sec)

mysql> DELIMITER ;
```

```
mysql> SHOW CREATE PROCEDURE UpdateSalary;
+--------------+-------------------------------------------------------------+---------------------------------------------------------------------
-------------------------------------------------------------------------------+----------------------+----------------------+--------------------+
| Procedure    | sql_mode                                                    | Create Procedure
                                                                               | character_set_client | collation_connection | Database Collation |
+--------------+-------------------------------------------------------------+---------------------------------------------------------------------
-------------------------------------------------------------------------------+----------------------+----------------------+--------------------+
| UpdateSalary | STRICT_TRANS_TABLES,NO_AUTO_CREATE_USER,NO_ENGINE_SUBSTITUTION | CREATE DEFINER=`root`@`localhost` PROCEDURE `UpdateSalary`(IN posID INT, IN newSalary
 DECIMAL(10,2))
BEGIN
    UPDATE POSITION SET Salary = newSalary WHERE PositionID = posID;
END | latin1               | latin1_swedish_ci    | latin1_swedish_ci  |
+--------------+-------------------------------------------------------------+---------------------------------------------------------------------
-------------------------------------------------------------------------------+----------------------+----------------------+--------------------+
1 row in set (0.00 sec)
```

6.CREATING USERS

```
mysql> CREATE USER 'Thaabe Lekopa'@'localhost' IDENTIFIED BY '2456';
Query OK, 0 rows affected (0.01 sec)

mysql> CREATE USER 'Given Botle'@'localhost' IDENTIFIED BY '1234';
Query OK, 0 rows affected (0.00 sec)
```

Granting Privilages

```
mysql> GRANT SELECT, INSERT ON TT_Holding.* TO 'Thaabe Lekopa'@'localhost';
Query OK, 0 rows affected (0.00 sec)

mysql> GRANT SELECT ON TT_Holding.PERSON TO 'Given Botle'@'localhost';
Query OK, 0 rows affected (0.00 sec)
```

```
mysql> SHOW GRANTS FOR 'Thaabe Lekopa'@'localhost';
+----------------------------------------------------------------------------------------------------------------+
| Grants for Thaabe Lekopa@localhost                                                                             |
+----------------------------------------------------------------------------------------------------------------+
| GRANT USAGE ON *.* TO 'Thaabe Lekopa'@'localhost' IDENTIFIED BY PASSWORD '*FE4D28A32F3FBE86A9F1275E372AFB5ADCE3CB54' |
| GRANT SELECT, INSERT ON `tt_holding`.* TO 'Thaabe Lekopa'@'localhost'                                          |
+----------------------------------------------------------------------------------------------------------------+
2 rows in set (0.00 sec)
```

```
mysql> SHOW GRANTS FOR 'Given Botle'@'localhost';
+------------------------------------------------------------------------------------------------------------+
| Grants for Given Botle@localhost                                                                           |
+------------------------------------------------------------------------------------------------------------+
| GRANT USAGE ON *.* TO 'Given Botle'@'localhost' IDENTIFIED BY PASSWORD '*A4B6157319038724E3560894F7F932C8886EBFCF' |
| GRANT SELECT ON `tt_holding`.`person` TO 'Given Botle'@'localhost'                                         |
+------------------------------------------------------------------------------------------------------------+
2 rows in set (0.00 sec)
```