DEBT MANAGEMENT DATABASE

Abstract

The debt management database is a project aimed at creating a debt management database to be utilized by the SMEs. The main objective is to have a centralized place where all the information regarding debt is stored accurately and, in this way, the process of managing debts will be more efficient.

By Mercy Ogero

ogeromerci@gmail.com

# **DEBT MANAGEMENT DATABASE PROJECT**

## **1.0 INTRODUCTION**

## **1.1 Defining the Problem**

Micro, Small, and Medium Enterprises (MSMEs) are important drivers of the economy by providing employment, reducing poverty, and generating income. However, these enterprises face a huge challenge, especially in debt management. Most of these businesses use traditional methods to record debtors, like the paper-based system, ledgers, and even physical books. Such traditional methods come with their limitations in that it is easy to lose such records. The following are the reasons that have prompted this initiative:

* Lack of a centralized tracking place where all the data regarding debts including the debt defaulters and the bad debts are recorded.
* Poor tracking of debts has led to inefficiency and errors.
* Limited reporting on debt-related matters in the SMEs due to unorganized information.
* Discrepancies in the current data recorded have led to poor decision-making and financial planning.
* Increased security risks lead to a possibility of a data breach with the traditional methods of recording data.

## **1.2 Defining the Solution**

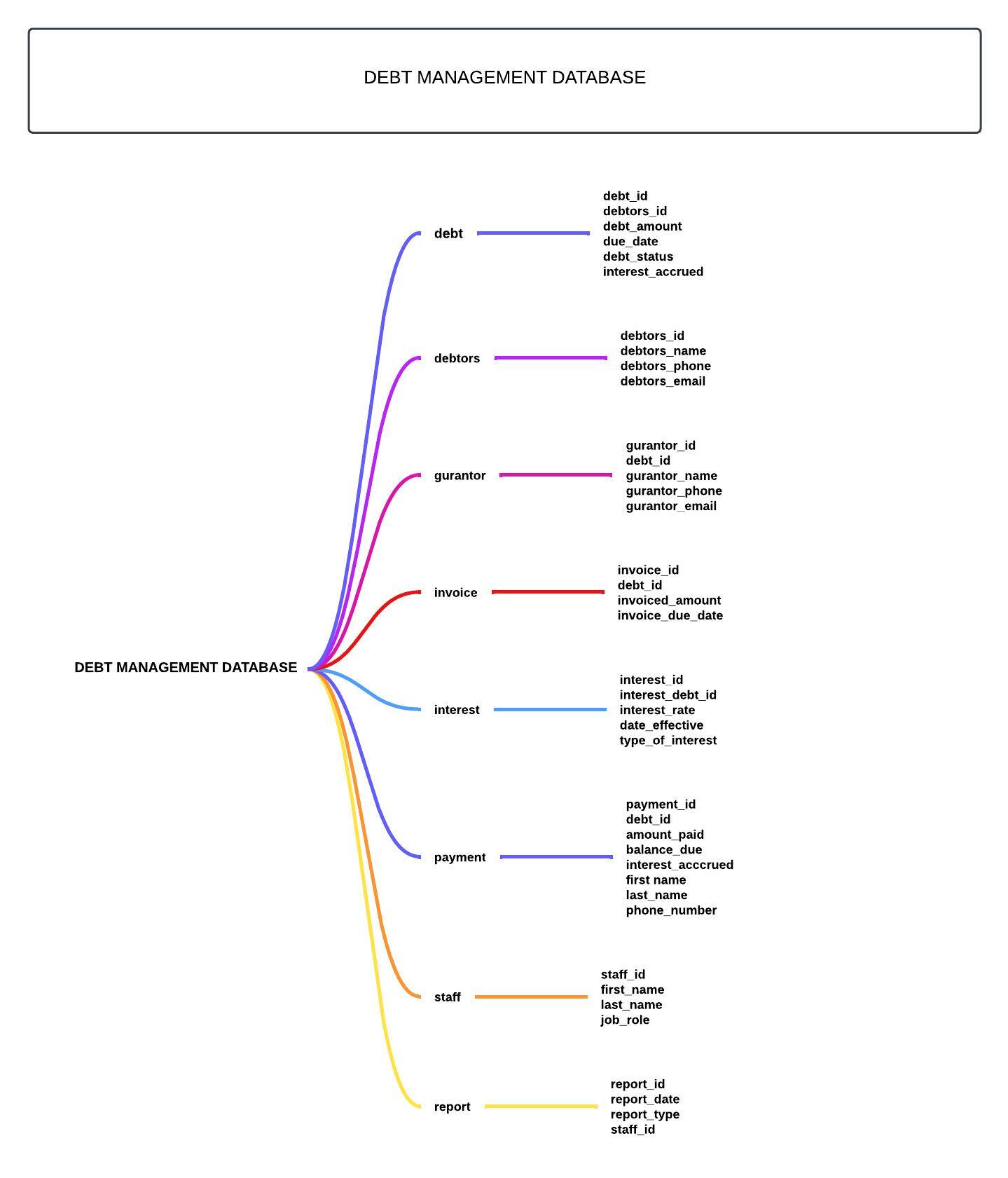
Inspired by the Central Bank of Kenya (CBK) listings of all the debt defaulters, the proposed database will also work in an almost similar manner. With these records in place, clients who have a habit of taking goods on credit and failing to pay can be avoided. The solution given will serve the SMEs by creating a central database where all the information regarding bad debts is stored. The following are the solutions that will be implemented:

* Implementing a centralized tracking place where all the data regarding bad debts are stored
* Proper tracking of debts and related information thereby eliminating errors
* Enhanced reporting on debt-related matters in the SMEs due to organized information.
* Eliminating discrepancies in the debt related data thereby leading to better decision-making and financial planning.
* Scalability in the database as the SME continues to grow.

## **1.1 THE CONCEPT (Conceptual modeling)**

The following is the conceptual model for the Debt Management Database project

* Each debtor has a debt
* Each debtor has a guarantor
* The debts have interest accrued
* Each debt has an invoice linked to it
* Report on the debt status are generated monthly
* Interest is charged for debtors who fail to pay their debts on time
* Staff information on the staff who issued the debt



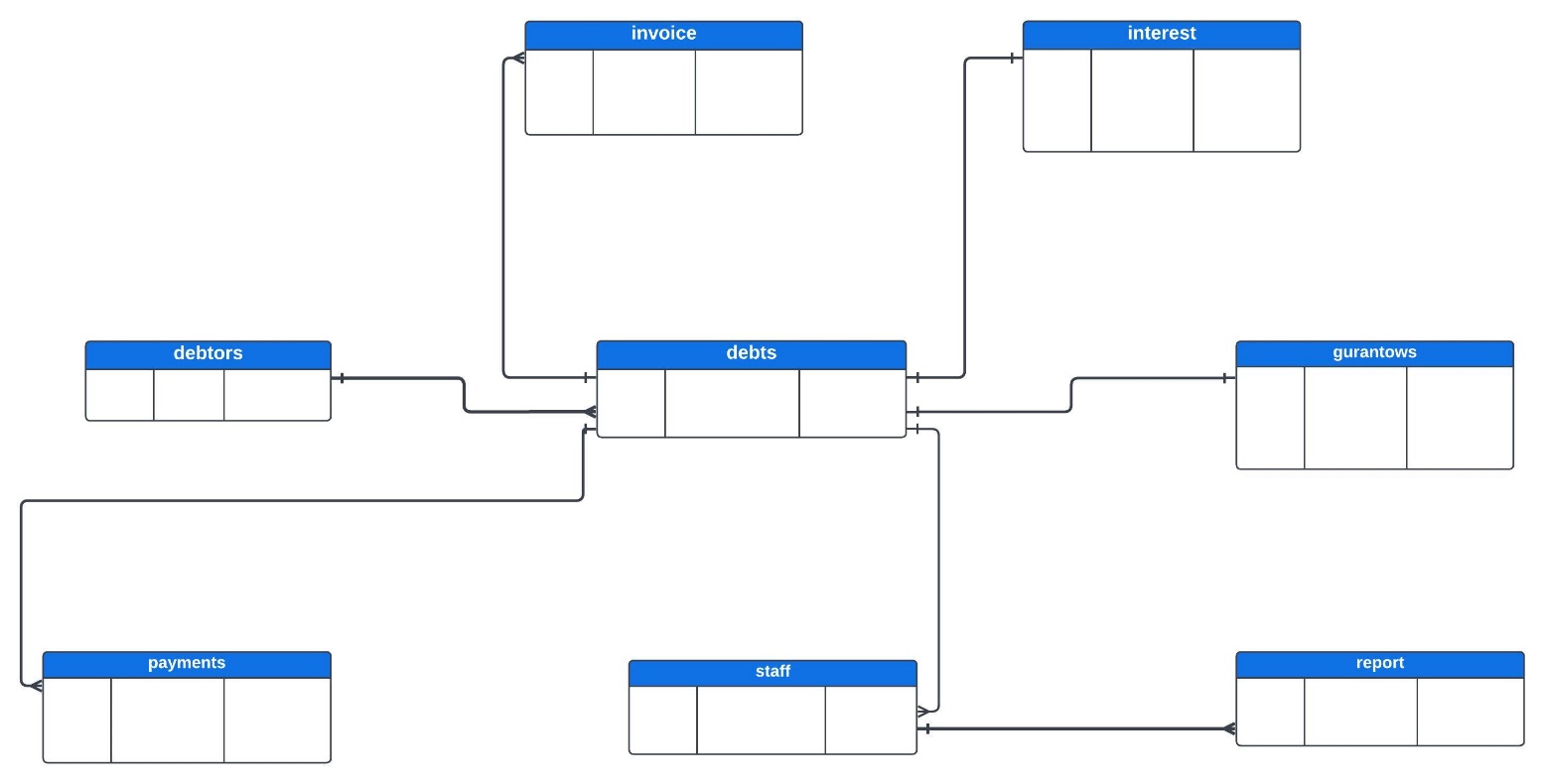
**Processes**

**Step 1: Identifying the Entities**

* Debt
* Debtors
* Guarantor
* Invoice
* Interest
* Payment
* Staff
* Report

**Step 2: Identifying connections within the entities**

* Each debtor has a debt
* Each invoice is linked to a debt
* Each debt has a guarantor
* Interests have accrued on the debts
* Payments are made on the debts
* Reports would be generated on the debt status each month
* Each debt has a staff who issued the loan

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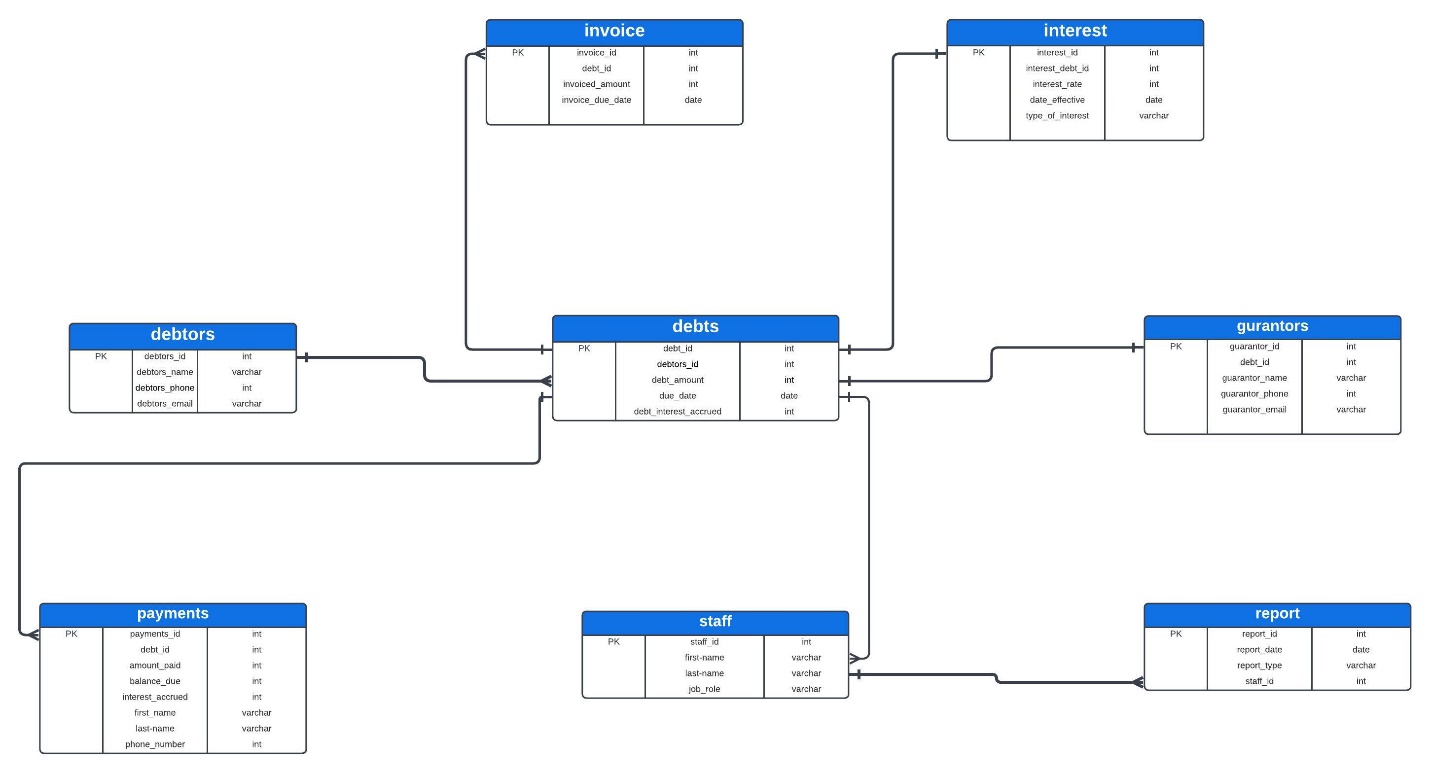
## **1.2 LOGICAL MODEL**

The logical model will involve identifying the attributes

|  |  |
| --- | --- |
| Entity | Attributes |
| Debt | debt\_id  debtors\_id  debt\_amount  due\_date  debt\_interest\_accrued |
| Debtors | debtors\_id  debtors\_name  debtors\_phone  debtors\_email |
| Guarantor | gurantor\_id  debt\_id  gurantor\_name  gurantor\_phone  gurantor\_email |
| Invoice | invoice\_id  debt\_id  invoiced\_amount  invoice\_due\_date |
| Interest | interest\_id  interest\_debt\_id  interest\_rate  date\_effective  type\_of\_interest |
| Payment | payment\_id  debt\_id  amount\_paid  balance\_due  interest\_acccrued  first\_name  last\_name  phone\_number |
| Staff | staff\_id  first\_name  last\_name  job\_role |
| Report | report\_id  report\_date  report\_type  staff\_id |

1.3 PHYSICAL MODEL

This step involves deciding attribute’s specific data types.



**Creating Tables in the Database**

--CREATING TABLES IN THE DATABASE---

--1. Creating under debt\_management\_database

--report (report\_id, report\_date, report\_type, staff\_id)

**CREATE** **TABLE** report (

report\_id INTERGER **PRIMARY** **KEY**,

report\_date **DATE**,

report\_type **VARCHAR** (50),

staff\_id INTERGER);

**SELECT** \* **FROM** report;

-- Creating under debt\_management\_database

-- debt (debt\_id, debtors\_id, debt\_amount, due\_date, debt\_interest\_accrued)

**CREATE** **TABLE** **IF** **NOT** **EXISTS** debt(

debt\_id **INTEGER** **PRIMARY** **KEY**,

debtors\_id **INTEGER**,

debt\_amount INTERGER,

due\_date **DATE**,

debt\_interest\_accrued INTERGER);

**SELECT** \* **FROM** debt;

-- Creating under debt\_management\_database

-- debtors (debtors\_id, debtors\_name, debtors\_phone, debtors\_email)

**CREATE** **TABLE** **IF** **NOT** **EXISTS** debtors(

debtors\_id **INTEGER** **PRIMARY** **KEY**,

debtors\_name **VARCHAR**(100),

debtors\_phone INTERGER,

debtors\_email **VARCHAR**(50));

**SELECT** \* **FROM** ***debtors***;

-- Creating under debt\_management\_database

-- guarantors (guarantor\_id, debt\_id, guarantor\_name, guarantor\_phone, guarantor\_email)

**CREATE** **TABLE** **IF** **NOT** **EXISTS** guarantors(

guarantor\_id **INTEGER** **PRIMARY** **KEY**,

debt\_id **INTEGER**,

guarantor\_name **VARCHAR**(100),

guarantor\_phone INTERGER,

guarantor\_email **VARCHAR**(50));

**SELECT** \* **FROM** ***guarantors***;

-- Creating under debt\_management\_database

-- invoice (invoice\_id, debt\_id, invoiced\_amount, invoice\_due\_date)

**CREATE** **TABLE** **IF** **NOT** **EXISTS** invoice(

invoice\_id **INTEGER** **PRIMARY** **KEY**,

debt\_id **INTEGER**,

invoiced\_amount INTERGER,

invoice\_due\_date **DATE**);

**SELECT** \* **FROM** ***invoice***;

-- Creating under debt\_management\_database

-- interest (interest\_id, interest\_debt\_id, interest\_rate, date\_effective, type\_of\_interest)

**CREATE** **TABLE** **IF** **NOT** **EXISTS** interest(

interest\_id **INTEGER** **PRIMARY** **KEY**,

interest\_debt\_id **INTEGER**,

interest\_rate **FLOAT**,

date\_effective **DATE**,

type\_of\_interest **VARCHAR**(50));

**SELECT** \* **FROM** ***interest***;

-- Creating under debt\_management\_database

-- payments (payment\_id, debt\_id, amount\_paid, balance\_due, interest\_accrued, first\_name, last\_name, phone\_number)

**CREATE** **TABLE** **IF** **NOT** **EXISTS** payments(

payment\_id **INTEGER** **PRIMARY** **KEY**,

debt\_id **INTEGER**,

amount\_paid INTERGER,

balance\_due INTERGER,

interest\_accrued INTERGER,

first\_name **VARCHAR**(50),

last\_name **VARCHAR**(50),

phone\_number INTERGER);

**SELECT** \* **FROM** ***payments***;

-- Creating under debt\_management\_database

-- staff (staff\_id, first\_name, last\_name, job\_role)

**CREATE** **TABLE** **IF** **NOT** **EXISTS** staff(

staff\_id **INTEGER** **PRIMARY** **KEY**,

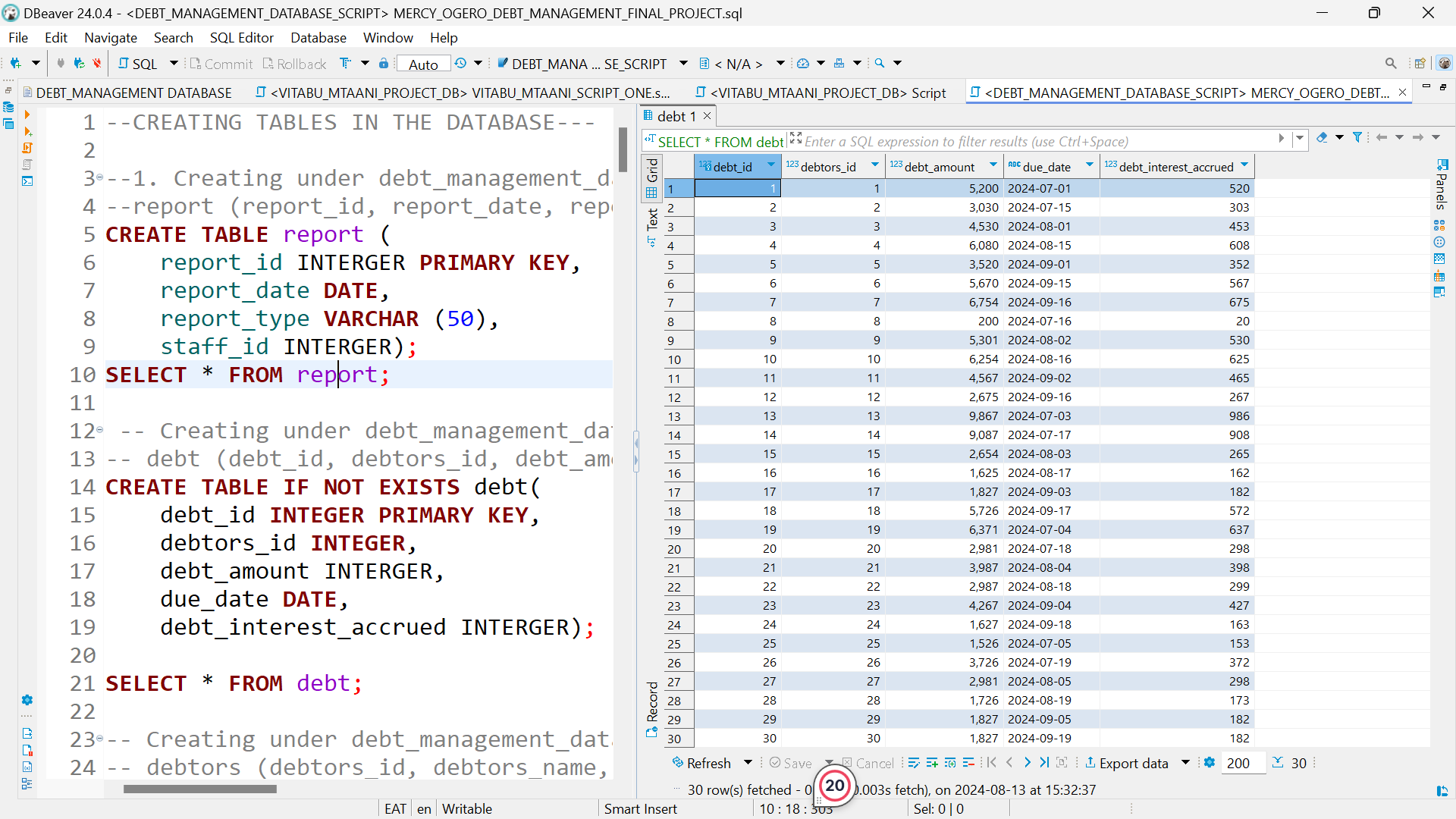
first\_name **VARCHAR**(50),

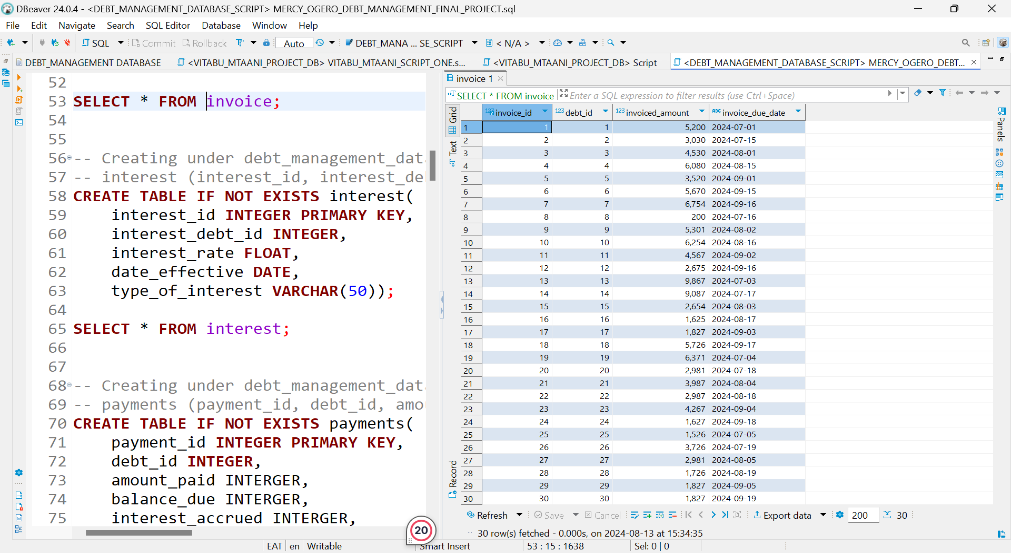
last\_name **VARCHAR**(50),

job\_role **VARCHAR**(50));

**SELECT** \* **FROM** ***staff***;

**Sample Results**





**Inserting Records into the Tables**

--INSERTING RECORDS IN THE TABLES--

--Inserting records to the reports table

**INSERT** **INTO** report (report\_id, report\_date, report\_type, staff\_id)

**VALUES**

(1, **'2024-01-07'**, **'Debt Overview Report'**, 1),

(2, **'2024-01-14'**, **'Debt Overview Report'**, 2),

(3, **'2024-01-21'**, **'Interest Accrued Report'**, 3),

(4, **'2024-01-28'**, **'Payment Summary Report'**, 4),

(5, **'2024-02-04'**, **'Interest Accrued Report'**, 5),

(6, **'2024-02-11'**, **'Invoice Summary Report'**, 6),

(7, **'2024-02-18'**, **'Guarantor Status Summary report'**, 7),

(8, **'2024-02-25'**, **'Interest Accrued Report'**, 8),

(9, **'2024-03-03'**, **'Payment Summary Report'**, 9),

(10, **'2024-03-10'**, **'Guarantor Status Summary report'**, 10),

(11, **'2024-03-17'**, **'Invoice Summary Report'**, 11),

(12, **'2024-03-24'**, **'Interest Accrued Report'**, 12),

(13, **'2024-03-31'**, **'Payment Summary Report'**, 13),

(14, **'2024-04-07'**, **'Staff Performance Report'**, 14),

(15, **'2024-04-14'**, **'Staff Performance Report'**, 15),

(16, **'2024-04-21'**, **'Interest Accrued Report'**, 16),

(17, **'2024-04-28'**, **'Payment Summary Report'**, 17),

(18, **'2024-05-05'**, **'Invoice Summary Report'**, 18),

(19, **'2024-05-12'**, **'Interest Accrued Report'**, 19),

(20, **'2024-05-19'**, **'Guarantor Status Summary report'**, 20),

(21, **'2024-05-26'**, **'Guarantor Status Summary report'**, 21),

(22, **'2024-06-02'**, **'Interest Accrued Report'**, 22),

(23, **'2024-06-09'**, **'Payment Summary Report'**, 23),

(24, **'2024-06-16'**, **'Interest Accrued Report'**, 24),

(25, **'2024-06-23'**, **'Invoice Summary Report'**, 25),

(26, **'2024-06-30'**, **'Invoice Summary Report'**, 26),

(27, **'2024-07-07'**, **'Interest Accrued Report'**, 27),

(28, **'2024-07-14'**, **'Guarantor Status Summary report'**, 28),

(29, **'2024-07-21'**, **'Payment Summary Report'**, 29),

(30, **'2024-07-28'**, **'Invoice Summary Report'**, 30);

**SELECT** \* **FROM** report;

--Inserting records to the debts table

**INSERT** **INTO** debt (debt\_id, debtors\_id, debt\_amount, due\_date, debt\_interest\_accrued)

**VALUES**

(1, 1, 5200, **'2024-07-01'**, 520),

(2, 2, 3030, **'2024-07-15'**, 303),

(3, 3, 4530, **'2024-08-01'**, 453),

(4, 4, 6080, **'2024-08-15'**, 608),

(5, 5, 3520, **'2024-09-01'**, 352),

(6, 6, 5670, **'2024-09-15'**, 567),

(7, 7, 6754, **'2024-09-16'**, 675),

(8, 8, 200, **'2024-07-16'**, 20),

(9, 9, 5301, **'2024-08-02'**, 530),

(10, 10, 6254, **'2024-08-16'**, 625),

(11, 11, 4567, **'2024-09-02'**, 465),

(12, 12, 2675, **'2024-09-16'**, 267),

(13, 13, 9867, **'2024-07-03'**, 986),

(14, 14, 9087, **'2024-07-17'**, 908),

(15, 15, 2654, **'2024-08-03'**, 265),

(16, 16, 1625, **'2024-08-17'**, 162),

(17, 17, 1827, **'2024-09-03'**, 182),

(18, 18, 5726, **'2024-09-17'**, 572),

(19, 19, 6371, **'2024-07-04'**, 637),

(20, 20, 2981, **'2024-07-18'**, 298),

(21, 21, 3987, **'2024-08-04'**, 398),

(22, 22, 2987, **'2024-08-18'**, 299),

(23, 23, 4267, **'2024-09-04'**, 427),

(24, 24, 1627, **'2024-09-18'**, 163),

(25, 25, 1526, **'2024-07-05'**, 153),

(26, 26, 3726, **'2024-07-19'**, 372),

(27, 27, 2981, **'2024-08-05'**, 298),

(28, 28, 1726, **'2024-08-19'**, 173),

(29, 29, 1827, **'2024-09-05'**, 182),

(30, 30, 1827, **'2024-09-19'**, 182);

**SELECT** \* **FROM** debt;

--Inserting records into the debtors table

**INSERT** **INTO** ***debtors*** (***debtors\_id***, ***debtors\_name***, ***debtors\_phone***, ***debtors\_email***)

**VALUES**

(1, **'Mercy'**, **'62084819'**, **'ogero@gmail.com'**),

(2, **'Teresa'**, **'47128843'**, **'Munuve@gmail.com'**),

(3, **'Michael'**, **'62920015'**, **'levin@gmail.com'**),

(4, **'Emily'**, **'57053674'**, **'masita@gmail.com'**),

(5, **'Teresa'**, **'7664413'**, **'ogero@gmail.com'**),

(6, **'Sophia'**, **'19936335'**, **'kerubo@gmail.com'**),

(7, **'James'**, **'66401543'**, **'Muiruris@gmail.com'**),

(8, **'Olivia'**, **'7221629'**, **'mbare@gmail.com'**),

(9, **'Alexander'**, **'24595077'**, **'wanjuki@gmail.com'**),

(10, **'Emma'**, **'16870671'**, **'kira@gmail.com'**),

(11, **'Daniel'**, **'13591739'**, **'wilele@gmail.com'**),

(12, **'Isabella'**, **'57797402'**, **'maore@gmail.com'**),

(13, **'Matthew'**, **'33839639'**, **'kamba@gmail.com'**),

(14, **'Mia'**, **'70042175'**, **'waru@gmail.com'**),

(15, **'Benjamin'**, **'77341808'**, **'timau@gmail.com'**),

(16, **'Ava'**, **'53474362'**, **'helsinki@gmail.com'**),

(17, **'Elijah'**, **'11097208'**, **'kauri@gmail.com'**),

(18, **'Charlotte'**, **'66152864'**, **'jambe@gmail.com'**),

(19, **'Logan'**, **'56528277'**, **'amber@gmail.com'**),

(20, **'Amelia'**, **'28776413'**, **'kiran@gmail.com'**),

(21, **'Lucas'**, **'31338183'**, **'warutere@gmail.com'**),

(22, **'Evelyn'**, **'25991772'**, **'adhiambo@gmail.com'**),

(23, **'Mary'**, **'75462294'**, **'mugure@gmail.com'**),

(24, **'William'**, **'55133569'**, **'kanyeki@gmail.com'**),

(25, **'Aiden'**, **'10506514'**, **'samba@gmail.com'**),

(26, **'Grace'**, **'25145998'**, **'waceke@gmail.com'**),

(27, **'Jackson'**, **'47448314'**, **'kilili@gmail.com'**),

(28, **'Scarlett'**, **'21622996'**, **'gachanja@gmail.com'**),

(29, **'David'**, **'22654498'**, **'kanyi@gmail.com'**),

(30, **'Victoria'**, **'23490043'**, **'rubadiri@gmail.com'**);

**SELECT** \* **FROM** debtors ;

-- Insert records into guarantors table

**INSERT** **INTO** ***guarantors*** (***guarantor\_id***, ***debt\_id***, ***guarantor\_name***, ***guarantor\_phone***, ***guarantor\_email***)

**VALUES**

(1, 12, **'Mercy'**, 7204766, **'mercy@gmail.com'**),

(2, 9, **'Nyamoita'**, 7339626, **'nyamoita@gmail.com'**),

(3, 5, **'Ogero'**, 7759360, **'ogero@gmail.com'**),

(4, 23, **'Bochaberi'**, 7513807, **'bochaberi@gmail.com'**),

(5, 18, **'Ombori'**, 7742616, **'ombori@gmail.com'**),

(6, 1, **'Tersae'**, 7927779, **'tersae@gmail.com'**),

(7, 8, **'Kemuntor'**, 7513953, **'kemuntor@gmail.com'**),

(8, 14, **'Ogreho'**, 7676761, **'ogreho@gmail.com'**),

(9, 27, **'Ivy'**, 7245284, **'ivy@gmail.com'**),

(10, 21, **'Mark'**, 7300502, **'mark@gmail.com'**),

(11, 20, **'Masara'**, 7859398, **'masara@gmail.com'**),

(12, 2, **'Ogerohk'**, 7961875, **'ogerohk@gmail.com'**),

(13, 15, **'Justine'**, 7744599, **'justine@gmail.com'**),

(14, 10, **'Noah'**, 7924932, **'noah@gmail.com'**),

(15, 4, **'Olivia'**, 7542787, **'olivia@gmail.com'**),

(16, 3, **'Paul'**, 7696923, **'paul@gmail.com'**),

(17, 30, **'John'**, 7368993, **'john@gmail.com'**),

(18, 28, **'Rachel'**, 7787823, **'rachel@gmail.com'**),

(19, 11, **'Samuel'**, 7330556, **'samuel@gmail.com'**),

(20, 13, **'Tina'**, 7585310, **'tina@gmail.com'**),

(21, 6, **'Victor'**, 7399459, **'victor@gmail.com'**),

(22, 19, **'Wendy'**, 7907058, **'wendy@gmail.com'**),

(23, 7, **'Menyd Maitah'**, 7100948, **'menyd@gmail.com'**),

(24, 25, **'Yvonne'**, 7499179, **'yvonne@gmail.com'**),

(25, 22, **'Zachary'**, 7566256, **'zachary@gmail.com'**),

(26, 17, **'Isabella'**, 7870831, **'isabella@gmail.com'**),

(27, 29, **'Ethan Garcia'**, 7857249, **'ethan@gmail.com'**),

(28, 26, **'Sophia'**, 7411628, **'sophia@gmail.com'**),

(29, 24, **'Jayons'**, 7737190, **'jayons@gmail.com'**),

(30, 16, **'Ruto'**, 7435445, **'ruto@gmail.com'**);

**SELECT** \* **FROM** ***guarantors***;

--Inserting records into invoice table

**INSERT** **INTO** ***invoice*** (***invoice\_id***, ***debt\_id***, ***invoiced\_amount***, ***invoice\_due\_date***)

**VALUES**

(1, 1, 5200, **'2024-07-01'**),

(2, 2, 3030, **'2024-07-15'**),

(3, 3, 4530, **'2024-08-01'**),

(4, 4, 6080, **'2024-08-15'**),

(5, 5, 3520, **'2024-09-01'**),

(6, 6, 5670, **'2024-09-15'**),

(7, 7, 6754, **'2024-09-16'**),

(8, 8, 200, **'2024-07-16'**),

(9, 9, 5301, **'2024-08-02'**),

(10, 10, 6254, **'2024-08-16'**),

(11, 11, 4567, **'2024-09-02'**),

(12, 12, 2675, **'2024-09-16'**),

(13, 13, 9867, **'2024-07-03'**),

(14, 14, 9087, **'2024-07-17'**),

(15, 15, 2654, **'2024-08-03'**),

(16, 16, 1625, **'2024-08-17'**),

(17, 17, 1827, **'2024-09-03'**),

(18, 18, 5726, **'2024-09-17'**),

(19, 19, 6371, **'2024-07-04'**),

(20, 20, 2981, **'2024-07-18'**),

(21, 21, 3987, **'2024-08-04'**),

(22, 22, 2987, **'2024-08-18'**),

(23, 23, 4267, **'2024-09-04'**),

(24, 24, 1627, **'2024-09-18'**),

(25, 25, 1526, **'2024-07-05'**),

(26, 26, 3726, **'2024-07-19'**),

(27, 27, 2981, **'2024-08-05'**),

(28, 28, 1726, **'2024-08-19'**),

(29, 29, 1827, **'2024-09-05'**),

(30, 30, 1827, **'2024-09-19'**);

**SELECT** \* **FROM** ***invoice***;

--Inserting records into the payment table

**INSERT** **INTO** ***payments*** (***payment\_id***, ***debt\_id***, ***amount\_paid***, ***balance\_due***, ***interest\_accrued***, ***first\_name***, ***last\_name***, ***phone\_number***)

**VALUES**

(1, 1, 1500, 3700, 520, **'Mercy'**, **'Ogero'**, 62084819),

(2, 2, 1000, 2030, 303, **'Teresa'**, **'Munuve'**, 47128843),

(3, 3, 2000, 2530, 453, **'Michael'**, **'Levin'**, 62920015),

(4, 4, 2500, 3580, 608, **'Emily'**, **'Masita'**, 57053674),

(5, 5, 1200, 2320, 352, **'Teresa'**, **'Ogero'**, 7664413),

(6, 6, 3000, 2670, 567, **'Sophia'**, **'Kerubo'**, 19936335),

(7, 7, 3500, 3254, 675, **'James'**, **'Muiruri'**, 66401543),

(8, 8, 50, 150, 20, **'Olivia'**, **'Mbare'**, 7221629),

(9, 9, 2500, 2801, 530, **'Alexander'**, **'Wanjuki'**, 24595077),

(10, 10, 3000, 3254, 625, **'Emma'**, **'Kira'**, 16870671),

(11, 11, 2000, 2567, 465, **'Daniel'**, **'Wilele'**, 13591739),

(12, 12, 1000, 1675, 267, **'Isabella'**, **'Maoore'**, 57797402),

(13, 13, 4000, 5867, 986, **'Matthew'**, **'Kambar'**, 33839639),

(14, 14, 4500, 4587, 908, **'Mia'**, **'Waru'**, 70042175),

(15, 15, 1300, 1354, 265, **'Benjamin'**, **'Timau'**, 77341808),

(16, 16, 800, 825, 162, **'Ava'**, **'Helsinki'**, 53474362),

(17, 17, 1000, 827, 182, **'Elijah'**, **'Kauri'**, 11097208),

(18, 18, 3000, 2726, 572, **'Charlotte'**, **'Jambe'**, 66152864),

(19, 19, 2000, 4371, 637, **'Logan'**, **'Amber'**, 56528277),

(20, 20, 1200, 1781, 298, **'Amelia'**, **'Kiran'**, 28776413),

(21, 21, 2000, 1987, 398, **'Lucas'**, **'Warutere'**, 31338183),

(22, 22, 1000, 1987, 299, **'Evelyn'**, **'Adhiambo'**, 25991772),

(23, 23, 2000, 2267, 427, **'Mary'**, **'Mugure'**, 75462294),

(24, 24, 800, 827, 163, **'William'**, **'Kanyeki'**, 55133569),

(25, 25, 600, 926, 153, **'Aiden'**, **'Samba'**, 10506514),

(26, 26, 1500, 2226, 372, **'Grace'**, **'Waceke'**, 25145998),

(27, 27, 1000, 1981, 298, **'Jackson'**, **'Kilili'**, 47448314),

(28, 28, 1000, 726, 173, **'Scarlett'**, **'Gachanja'**, 21622996),

(29, 29, 900, 927, 182, **'David'**, **'Kanyi'**, 22654498),

(30, 30, 1000, 827, 182, **'Victoria'**, **'Rubadiri'**, 23490043);

**SELECT** \* **FROM** ***payments***;

--Inserting records into the staff table

**INSERT** **INTO** ***staff*** (***staff\_id***, ***first\_name***, ***last\_name***, ***job\_role***)

**VALUES**

(1, **'Brianna'**, **'Wauche'**, **'Accountant'**),

(2, **'Talisha'**, **'Sinet'**, **'Accountant'**),

(3, **'Sironet'**, **'Chania'**, **'Accountant'**),

(4, **'Lehsan'**, **'Mangu'**, **'Accountant'**),

(5, **'Genesis'**, **'Mwangi'**, **'Accountant'**),

(6, **'Exidus'**, **'Ganjo'**, **'Accountant'**),

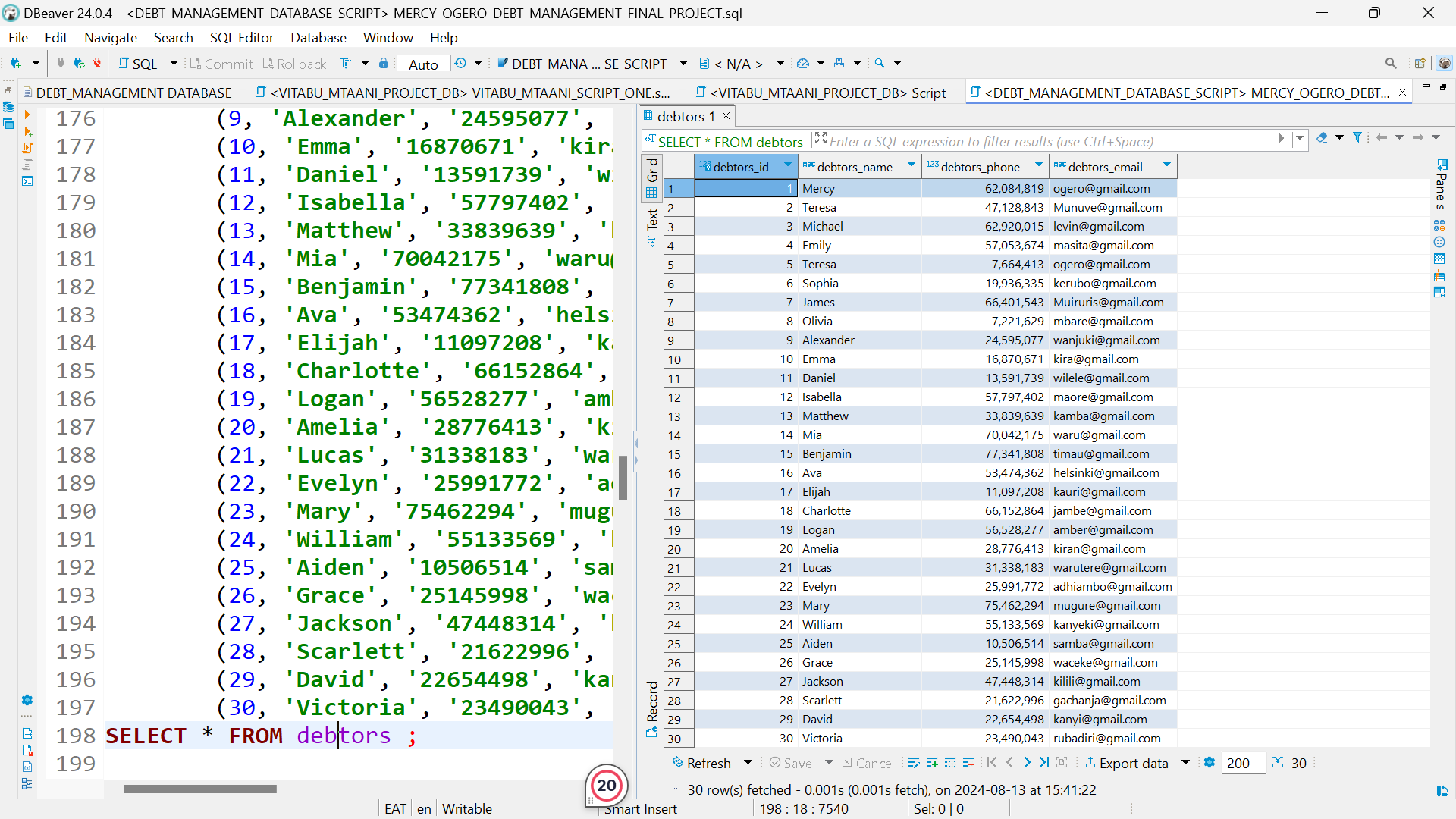
(7, **'Leviticus'**, **'Naarugu'**, **'Accountant'**),

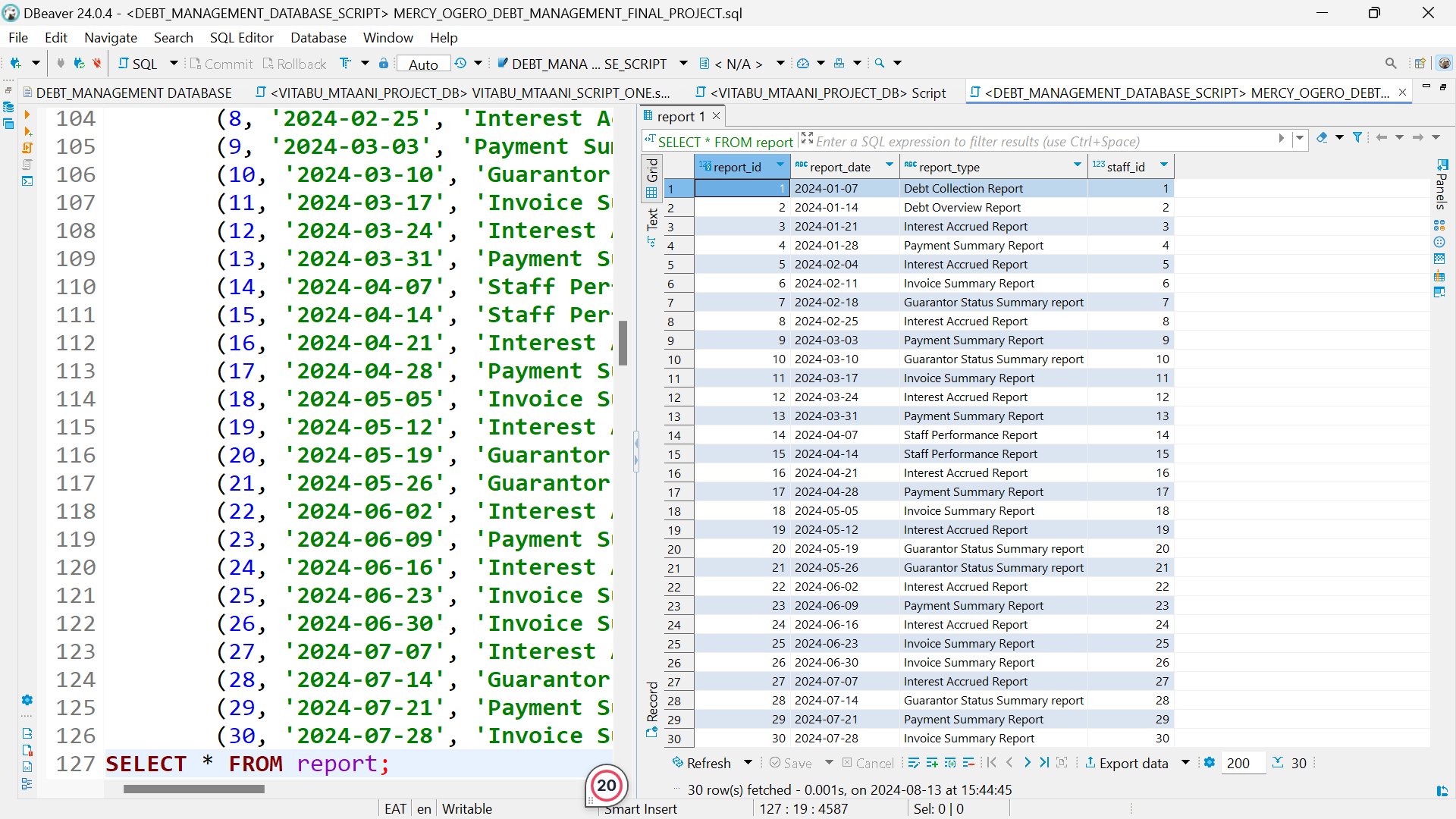
(8, **'Deutronomy'**, **'Ngenda'**, **'Accountant'**),

(9, **'Teresa'**, **'Murera'**, **'Accountant'**),

(10, **'Mary'**, **'Teta'**, **'Accountant'**);

**SELECT** \* **FROM** ***staff***;





--JOINS

--Joining the debts and the debtors tab;e

**SELECT** \*

**FROM** debt *d*

**INNER** **JOIN** ***debtors*** *db*

**ON** debt.***debtor\_id*** = ***debtors***.debtor\_id;

--Joining the debtors table and the guarantors table

**SELECT** \*

**FROM** debt *d*

**RIGHT** **JOIN** ***guarantors*** *g*

**ON** *d*.debt\_id = *g*.***debt\_id***;