IS 443 Group 3

Online Bank Database

Nicole Jacobo

Paul Lombard

Folly Adamazan Teko

Mohamed Abdi

Dego Mohamed

Claude Lee

Business Rules

A bank has many departments. Each department belongs to one bank.

A department has many employees. Each employee belongs to one department.

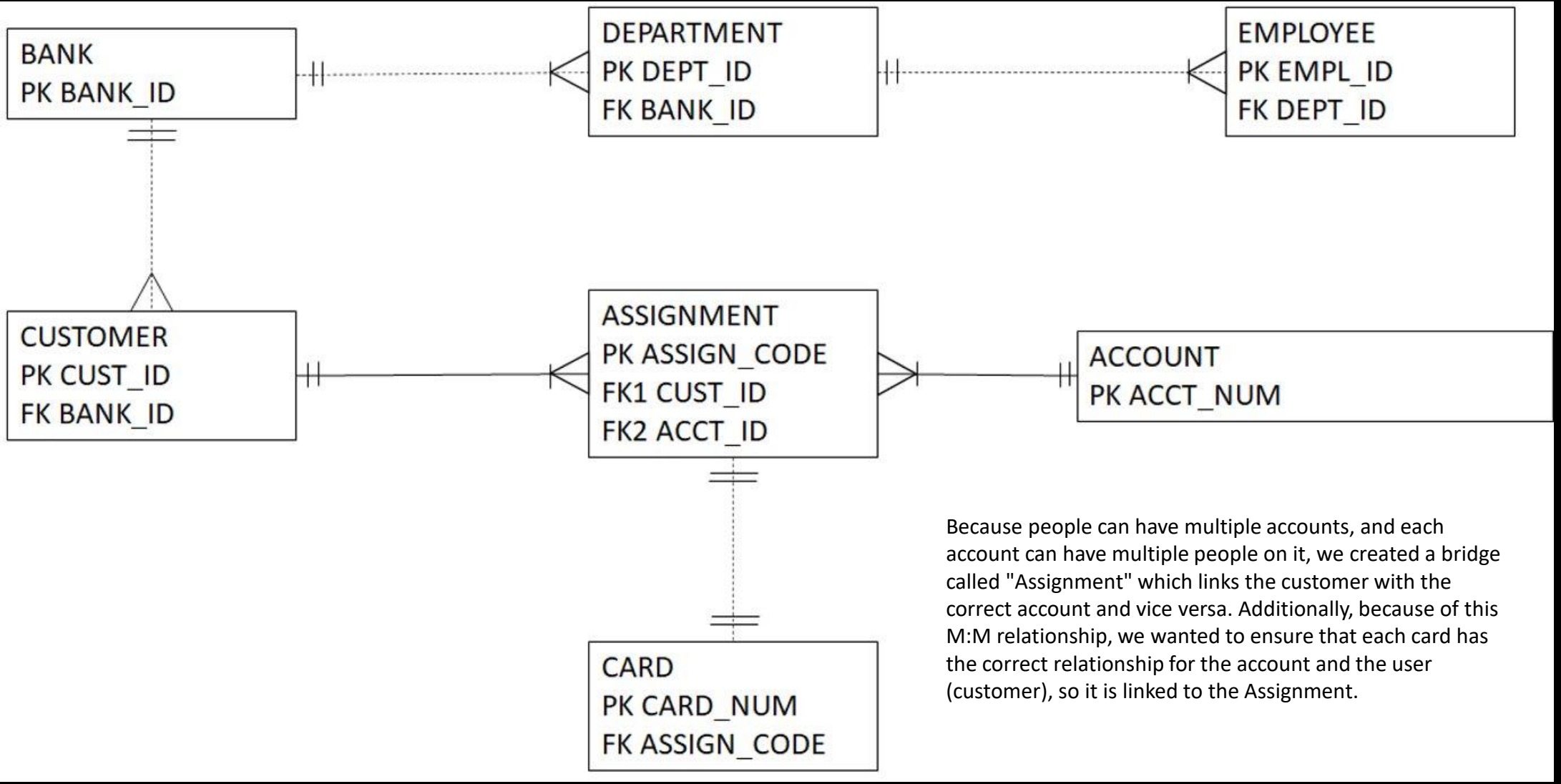
A bank has many customers. Each customer belongs to one bank.

A customer can have many account assignments. Each account assignment can belong to one customer.

An account can have many account assignments. Each account assignment can belong to one account.

An account assignment can have one card. Each card belongs to one account assignment.

ERD



Because people can have multiple accounts, and each account can have multiple people on it, we created a bridge called "Assignment" which links the customer with the correct account and vice versa. Additionally, because of this M:M relationship, we wanted to ensure that each card has the correct relationship for the account and the user (customer), so it is linked to the Assignment.

Attributes

Entity	Primary Key	Foreign Key	Other Attributes
BANK	BANK_ID	NONE	BANK_NAME, BANK_ADDR, BANK_ZIP, BANK_AREACODE, BANK_PHONE
DEPARTMENT	DEPART_ID	BANK_ID	DEPART_NAME
EMPLOYEE	EMP_ID	DEPART_ID	EMP_FNAME, EMP_LNAME, EMP_INITIAL, EMP_HIREDATE, JOB_TITLE
CUSTOMER	CUS_ID	BANK_ID	CUS_LNAME, CUS_FNAME, CUS_INITIAL, CUS_AREACODE, CUS_PHONE
BANK_ACCOUNT	ACCT_NUM	NONE	ACCT_TYPE, ACCT_BAL, OPEN_DATE, ACTIV_STATUS
ASSIGNMENT	ASSIGN_CODE	CUS_ID, ACCT_NUM	
CARD	CARD_NUM	ASSIGN_CODE	CARD_TYPE, ISSUE_DATE, EXPIR_DATE, CARD_PIN

Bank Table

```
CREATE TABLE BANK (
BANK_ID    NUMBER     PRIMARY KEY NOT NULL,
BANK_NAME      VARCHAR(15) NOT NULL,
BANK_ADDR      VARCHAR(35) NOT NULL,
BANK_ZIP       NUMBER(5)     NOT NULL,
BANK_AREACODE   CHAR(3)     NOT NULL,
BANK_PHONE      CHAR(8)     NOT NULL);
```

Attribute Name	Format	Description
BANK_ID (PK)	Number	Bank ID Number
BANK_NAME	Up to 15 Chars	Bank Name
BANK_ADDR	Up to 35 Chars	Bank Street Address
BANK_ZIP	5 Numbers	Bank Zip Code
BANK_AREACODE	3 Chars	Bank Area Code
BANK_PHONE	8 Chars	Bank Phone Number

Department Table

```
CREATE TABLE DEPARTMENT (
DEPART_ID       NUMBER  PRIMARY KEY NOT NULL,
DEPART_NAME     VARCHAR(15)     NOT NULL,
BANK_ID         NUMBER          NOT NULL,
FOREIGN KEY (BANK_ID) REFERENCES BANK);
```

Attribute Name	Format	Description
DEPART_ID (PK)	Number	Department ID Number
BANK_ID (FK)	Number	Bank ID Number
DEPART_NAME	Up to 15 Chars	Name of Department

Employee Table

```
CREATE TABLE EMPLOYEE (
EMP_ID     NUMBER    PRIMARY KEY NOT NULL,
EMP_FNAME   VARCHAR(15) NOT NULL,
EMP_LNAME   VARCHAR(15) NOT NULL,
EMP_INITIAL CHAR(1),
EMP_HIREDATE DATE,
JOB_TITLE    VARCHAR(25),
DEPART_ID   NUMBER,
FOREIGN KEY (DEPART_ID) REFERENCES DEPARTMENT);
```

Attribute Name	Format	Description
EMP_ID (PK)	Number	Employee ID Number
DEPART_ID (FK)	Number	Department ID Number
EMP_FNAME	Up to 15 Chars	Employee's First Name
EMP_LNAME	Up to 15 Chars	Employee's Last Name
EMP_INITIAL	1 Char	Employee's Middle Initial
EMP_HIREDATE	Date	Employee’s Hiring Date
JOB_TITLE	Up to 25 Chars	Employee's Job Title

Customer Table

```
CREATE TABLE CUSTOMER (
CUS_ID      NUMBER     PRIMARY KEY NOT NULL,
CUS_LNAME       VARCHAR(15) NOT NULL,
CUS_FNAME       VARCHAR(15) NOT NULL,
CUS_INITIAL     CHAR(1),
CUS_AREACODE    CHAR(3),
CUS_PHONE       CHAR(8),
BANK_ID         NUMBER,
FOREIGN KEY (BANK_ID) REFERENCES BANK);
```

Attribute Name	Format	Description
CUS_ID (PK)	Number	Customer ID Number
BANK_ID (FK)	Number	Bank ID Number
CUS_LNAME	Up to 15 Chars	Customer's Last Name
CUS_FNAME	Up to 15 Chars	Customer's First Name
CUS_INITIAL	1 Char	Customer's Middle Initial
CUS_AREACODE	3 Chars	Customer's Area Code
CUS_PHONE	8 Chars	Customer's Phone Number

Bank Account Table

```
CREATE TABLE BANK_ACCOUNT (
ACCT_NUM    NUMBER   PRIMARY KEY NOT NULL,
ACCT_TYPE      VARCHAR(10) NOT NULL,
ACCT_BAL       NUMBER(10,2) NOT NULL,
OPEN_DATE      DATE,
ACTIV_STATUS    VARCHAR(10) NOT NULL);
```

Attribute Name	Format	Description
ACCT_NUM (PK)	Number	Customer ID Number
ACCT_TYPE	Up to 10 Chars	Type of Account (ex. Checking, Savings, IRA)
ACCT_BAL	Up to 9999999.99	Account Balance
OPEN_DATE	Date	Date of Account Opening
ACTIV_STATUS	Up to 10 Chars	Account Activity Status (ex. Active, Inactive, Closed)

Assignment Table

```
CREATE TABLE ASSIGNMENT (
ASSIGN_CODE  NUMBER  PRIMARY KEY NOT NULL,
CUS_ID          NUMBER,
ACCT_NUM       NUMBER,
FOREIGN KEY      (CUS_ID) REFERENCES CUSTOMER,
FOREIGN KEY      (ACCT_NUM) REFERENCES
BANK_ACCOUNT);
```

Attribute Name	Format	Description
ASSIGN_CODE (PK)	Number	Account Assignment Code
CUS_ID (FK)	Number	Customer ID Number
ACCT_NUM (FK)	Number	Account ID Number

Card Table

```
CREATE TABLE CARD (
CARD_NUM    NUMBER(16)   PRIMARY KEY NOT NULL,
CARD_TYPE     VARCHAR(10) NOT NULL,
ISSUE_DATE    DATE,
EXPIR_DATE    DATE,
CARD_PIN      NUMBER(4)     NOT NULL,
ASSIGN_CODE       NUMBER,
FOREIGN KEY       (ASSIGN_CODE) REFERENCES
ASSIGNMENT);
```

Attribute Name	Format	Description
CARD_NUM (PK)	16 Digit Number	Card Number
ASSIGN_CODE (FK)	Number	Links Card to Assignment
CARD_TYPE	Up to 10 Chars	Type of Card (ex. Debit Card, Credit Card, ATM Card)
ISSUE_DATE	Date	Date of Issue
EXPIR_DATE	Date	Date of Expiration
CARD_PIN	4 Digit Number	Card PIN

FULL CODE – Tables

```
CREATE TABLE BANK (
BANK_ID        NUMBER      PRIMARY KEY NOT NULL,
BANK_NAME      VARCHAR(15) NOT NULL,
BANK_ADDR      VARCHAR(35) NOT NULL,
BANK_ZIP       NUMBER(5)     NOT NULL,
BANK_AREACODE  CHAR(3)     NOT NULL,
BANK_PHONE     CHAR(8)     NOT NULL);

CREATE TABLE DEPARTMENT (
DEPART_ID      NUMBER  PRIMARY KEY NOT NULL,
DEPART_NAME    VARCHAR(15)     NOT NULL,
BANK_ID        NUMBER          NOT NULL,
FOREIGN KEY (BANK_ID) REFERENCES BANK);

CREATE TABLE EMPLOYEE (
EMP_ID     NUMBER      PRIMARY KEY NOT NULL,
EMP_FNAME  VARCHAR(15) NOT NULL,
EMP_LNAME  VARCHAR(15) NOT NULL,
EMP_INITIAL CHAR(1),
EMP_HIREDATE DATE,
JOB_TITLE   VARCHAR(25),
DEPART_ID   NUMBER,
FOREIGN KEY (DEPART_ID) REFERENCES DEPARTMENT);

CREATE TABLE CUSTOMER (
CUS_ID         NUMBER      PRIMARY KEY NOT NULL,
CUS_LNAME      VARCHAR(15) NOT NULL,
CUS_FNAME      VARCHAR(15) NOT NULL,
CUS_INITIAL    CHAR(1),
CUS_AREACODE   CHAR(3),
CUS_PHONE      CHAR(8),
BANK_ID        NUMBER,
FOREIGN KEY (BANK_ID) REFERENCES BANK);

CREATE TABLE BANK_ACCOUNT (
ACCT_NUM       NUMBER       PRIMARY KEY NOT NULL,
ACCT_TYPE      VARCHAR(10) NOT NULL,
ACCT_BAL       NUMBER(10,2) NOT NULL,
OPEN_DATE      DATE,
ACTIV_STATUS   VARCHAR(10) NOT NULL);

CREATE TABLE ASSIGNMENT (
ASSIGN_CODE       NUMBER       PRIMARY KEY NOT NULL,
CUS_ID         NUMBER,
ACCT_NUM       NUMBER,
FOREIGN KEY      (CUS_ID) REFERENCES CUSTOMER,
FOREIGN KEY      (ACCT_NUM) REFERENCES BANK_ACCOUNT);

CREATE TABLE CARD (
CARD_NUM       NUMBER(16)       PRIMARY KEY NOT NULL,
CARD_TYPE      VARCHAR(10) NOT NULL,
ISSUE_DATE     DATE,
EXPIR_DATE     DATE,
CARD_PIN       NUMBER(4)     NOT NULL,
ASSIGN_CODE       NUMBER,
FOREIGN KEY       (ASSIGN_CODE) REFERENCES ASSIGNMENT);
```

Bank Entries

INSERT INTO BANK VALUES (123, 'GROUP 3 BANK','720 4TH AVE S', 56301, '678','999-8212');

BANK_ID	BANK_NAME	BANK_ADDR	BANK_ZIP	BANK_AREACODE	BANK_PHONE
123	GROUP 3 BANK	720 4TH AVE S	56301	678	999-8212

Download CSV

Department Entries

```
INSERT INTO DEPARTMENT VALUES (001,'Retail',123);
INSERT INTO DEPARTMENT VALUES (002,'Lending',123);
INSERT INTO DEPARTMENT VALUES (003,'Loan Operations',123);
INSERT INTO DEPARTMENT VALUES (004,'Private Bank',123);
INSERT INTO DEPARTMENT VALUES (005,'Corporate Bank',123);
INSERT INTO DEPARTMENT VALUES (006,'Treasury',123);
INSERT INTO DEPARTMENT VALUES (007,'Credit Risk',123);
INSERT INTO DEPARTMENT VALUES (008,'Finance',123);
INSERT INTO DEPARTMENT VALUES (009,'HR',123);
INSERT INTO DEPARTMENT VALUES (010,'Adminisration',123);
```

DEPART_ID	DEPART_NAME	BANK_ID
1	Retail	123
2	Lending	123
3	Loan Operations	123
4	Private Bank	123
5	Corporate Bank	123
6	Treasury	123
7	Credit Risk	123
8	Finance	123
9	HR	123
10	Adminisration	123

Download CSV

10 rows selected.

Employee Entries

```
INSERT INTO EMPLOYEE VALUES (12345,'Adam','Thielen','J','20-JAN-2016','Teller',001);
INSERT INTO EMPLOYEE VALUES (23456,'Kirk','Cousins','A','20-FEB-2018','Loan Officer',002);
INSERT INTO EMPLOYEE VALUES (34567,'Joe','Mauer','J','20-JAN-2001','Loan Supervisor',003);
INSERT INTO EMPLOYEE VALUES (45678,'Justin','Jefferson','D','20-APR-2020','Financial Advisor',004);
INSERT INTO EMPLOYEE VALUES (56789,'Tom','Brady','P','20-JAN-2000','Business Lending',005);
INSERT INTO EMPLOYEE VALUES (67891,'Michael','Jordan','J','20-JAN-1984','Accounting',006);
```

EMP_ID	EMP_FNAME	EMP_LNAME	EMP_INITIAL	EMP_HIREDATE	JOB_TITLE	DEPART_ID
12345	Adam	Thielen	J	20-JAN-16	Teller	1
23456	Kirk	Cousins	A	20-FEB-18	Loan Officer	2
34567	Joe	Mauer	J	20-JAN-01	Loan Supervisor	3
45678	Justin	Jefferson	D	20-APR-20	Financial Advisor	4
56789	Tom	Brady	P	20-JAN-00	Business Lending	5
67891	Michael	Jordan	J	20-JAN-84	Accounting	6

Download CSV

6 rows selected.

Customer Entries

```
INSERT INTO CUSTOMER VALUES(1, 'Lombard', 'Paul', 'L', '320', '767-9575', 123);
INSERT INTO CUSTOMER VALUES(2, 'Lee', 'Claude', '', '320', '435-5978', 123);
INSERT INTO CUSTOMER VALUES(3, 'Mohamed', 'Dego', '', '507', '395-4893', 123);
INSERT INTO CUSTOMER VALUES(4, 'Mohamed', 'abdi', 'M', '789', '456-9803', 123);
INSERT INTO CUSTOMER VALUES(5, 'Adamazan teko', 'folly', '', '507', '375-9845', 123);
INSERT INTO CUSTOMER VALUES(6, 'Jacobo', 'Nicole', 'N', '320', '487-8946', 123);
INSERT INTO CUSTOMER VALUES(7, 'John', 'Doe', '', '750', '574-7909', 123);
INSERT INTO CUSTOMER VALUES(8, 'Jane', 'Doe', '', '869', '679-8943', 123);
INSERT INTO CUSTOMER VALUES(9, 'Ashey', 'Cole', 'C', '507', '689-7890',123);
INSERT INTO CUSTOMER VALUES(10, 'Abigail', 'Ayoko', '', '700', '345-8983', 123);
```

CUS_ID	CUS_LNAME	CUS_FNAME	CUS_INITIAL	CUS_AREACODE	CUS_PHONE	BANK_ID
1	Lombard	Paul	L	320	767-9575	123
2	Lee	Claude	-	320	435-5978	123
3	Mohamed	Dego	-	507	395-4893	123
4	Mohamed	abdi	M	789	456-9803	123
5	Adamazan teko	folly	-	507	375-9845	123
6	Jacobo	Nicole	N	320	487-8946	123
7	John	Doe	-	750	574-7909	123
8	Jane	Doe	-	869	679-8943	123
9	Ashey	Cole	C	507	689-7890	123
10	Abigail	Ayoko	-	700	345-8983	123

Download CSV

10 rows selected.

Bank Account Entries

```
INSERT INTO BANK_ACCOUNT VALUES(922404,'TRADIRA',86336.41,'24-JAN-1996','ACTIVE');
INSERT INTO BANK_ACCOUNT VALUES(599364,'SAVINGS',165.54,'14-OCT-2018','ACTIVE');
INSERT INTO BANK_ACCOUNT VALUES(260080,'SAVINGS',6393.48,'4-JAN-2006','ACTIVE');
INSERT INTO BANK_ACCOUNT VALUES(169609,'CHECKING',1303.82,'30-MAR-1995','ACTIVE');
INSERT INTO BANK_ACCOUNT VALUES(742833,'CHECKING',-359.65,'18-FEB-2014','OVERDRAWN');
INSERT INTO BANK_ACCOUNT VALUES(333390,'SAVINGS',49.32,'11-MAR-2002','INACTIVE');
INSERT INTO BANK_ACCOUNT VALUES(755869,'HSA',741.05,'29-NOV-2014','ACTIVE');
INSERT INTO BANK_ACCOUNT VALUES(551836,'SAVINGS',121620.68,'21-AUG-2006','ACTIVE');
INSERT INTO BANK_ACCOUNT VALUES(795894,'CHECKING',-12.92,'19-DEC-2018','OVERDRAWN');
INSERT INTO BANK_ACCOUNT VALUES(181260,'CHECKING',439.81,'25-FEB-2019','ACTIVE');
```

ACCT_NUM	ACCT_TYPE	ACCT_BAL	OPEN_DATE	ACTIV_STATUS
922404	TRADIRA	86336.41	24-JAN-96	ACTIVE
599364	SAVINGS	165.54	14-OCT-18	ACTIVE
260080	SAVINGS	6393.48	04-JAN-06	ACTIVE
169609	CHECKING	1303.82	30-MAR-95	ACTIVE
742833	CHECKING	-359.65	18-FEB-14	OVERDRAWN
333390	SAVINGS	49.32	11-MAR-02	INACTIVE
755869	HSA	741.05	29-NOV-14	ACTIVE
551836	SAVINGS	121620.68	21-AUG-06	ACTIVE
795894	CHECKING	-12.92	19-DEC-18	OVERDRAWN
181260	CHECKING	439.81	25-FEB-19	ACTIVE

Download CSV

10 rows selected.

Assignment Entries

```
INSERT INTO ASSIGNMENT VALUES(1, 1, 922404);
INSERT INTO ASSIGNMENT VALUES(2, 1, 599364);
INSERT INTO ASSIGNMENT VALUES(3, 2, 260080);
INSERT INTO ASSIGNMENT VALUES(4, 3, 169609);
INSERT INTO ASSIGNMENT VALUES(5, 4, 169609);
INSERT INTO ASSIGNMENT VALUES(6, 5, 169609);
INSERT INTO ASSIGNMENT VALUES(7, 6, 742833);
INSERT INTO ASSIGNMENT VALUES(8, 7, 742833);
INSERT INTO ASSIGNMENT VALUES(9, 8, 333390);
INSERT INTO ASSIGNMENT VALUES(10, 8, 181260);
INSERT INTO ASSIGNMENT VALUES(11, 9, 181260);
INSERT INTO ASSIGNMENT VALUES(12, 9, 755869);
INSERT INTO ASSIGNMENT VALUES(13, 10, 551836);
INSERT INTO ASSIGNMENT VALUES(14, 10, 795894);
```

ASSIGN_CODE	CUS_ID	ACCT_NUM
1	1	922404
2	1	599364
3	2	260080
4	3	169609
5	4	169609
6	5	169609
7	6	742833
8	7	742833
9	8	333390
10	8	181260
11	9	181260
12	9	755869
13	10	551836
14	10	795894

Download CSV

14 rows selected.

Card Entries

```
INSERT INTO CARD VALUES(4243507034864858, 'Debit', '22-OCT-2018', '23-OCT-2022', 1234, 1);
INSERT INTO CARD VALUES(4243507034863858, 'Debit', '22-OCT-2010', '23-OCT-2014', 1534, 2);
INSERT INTO CARD VALUES(4243507034862858, 'Credit', '22-OCT-2014', '23-OCT-2018', 1274, 3);
INSERT INTO CARD VALUES(4243507034865858, 'ATM', '22-OCT-2012', '22-OCT-2016', 2234, 4);
INSERT INTO CARD VALUES(4243407034864858, 'Credit', '22-OCT-2016', '23-OCT-2020', 6244, 5);
INSERT INTO CARD VALUES(4243507134865858, 'ATM', '22-OCT-2006', '23-OCT-2010', 4334, 6);
INSERT INTO CARD VALUES(4142507034864858, 'Debit', '22-JAN-2018', '23-JAN-2022', 8834, 7);
INSERT INTO CARD VALUES(4142507134865858, 'Credit', '2-FEB-2014', '3-FEB-2018', 6666, 8);
INSERT INTO CARD VALUES(4243570034864858, 'Debit', '06-JUN-2018', '07-JUN-2022', 1294, 9);
INSERT INTO CARD VALUES(4243507034864059, 'Credit', '22-OCT-2020', '23-OCT-2024', 1010, 10);
```

CARD_NUM	CARD_TYPE	ISSUE_DATE	EXPIR_DATE	CARD_PIN	ASSIGN_CODE
4243507034864858	Debit	22-OCT-18	23-OCT-22	1234	1
4243507034863858	Debit	22-OCT-10	23-OCT-14	1534	2
4243507034862858	Credit	22-OCT-14	23-OCT-18	1274	3
4243507034865858	ATM	22-OCT-12	22-OCT-16	2234	4
4243407034864858	Credit	22-OCT-16	23-OCT-20	6244	5
4243507134865858	ATM	22-OCT-06	23-OCT-10	4334	6
4142507034864858	Debit	22-JAN-18	23-JAN-22	8834	7
4142507134865858	Credit	02-FEB-14	03-FEB-18	6666	8
4243570034864858	Debit	06-JUN-18	07-JUN-22	1294	9
4243507034864059	Credit	22-OCT-20	23-OCT-24	1010	10

Download CSV

10 rows selected.

Query 1

We would like to encourage customers to open Checking Accounts. In order to target marketing efforts, we need to find all Customers who do not have Checking Accounts.

```
SELECT CUS_LNAME, CUS_FNAME, ACCT_TYPE, BANK_ACCOUNT.ACCT_NUM
FROM CUSTOMER, ASSIGNMENT, BANK_ACCOUNT
WHERE CUSTOMER.CUS_ID = ASSIGNMENT.CUS_ID
AND BANK_ACCOUNT.ACCT_NUM = ASSIGNMENT.ACCT_NUM
AND BANK_ACCOUNT.ACCT_TYPE != 'CHECKING';
```

CUS_LNAME	CUS_FNAME	ACCT_TYPE	ACCT_NUM
Lombard	Paul	TRADIRA	922404
Lombard	Paul	SAVINGS	599364
Lee	Claude	SAVINGS	260080
Jane	Doe	SAVINGS	333390
Ashey	Cole	HSA	755869
Abigail	Ayoko	SAVINGS	551836

Query 2

We would like to inform customers whose cards have been expired. To be able to obtain the list of those customers, we need to find all cards that have been expired and pull the assigned customer information.

```
SELECT CUS_LNAME, CUS_FNAME, CUS_INITIAL, CUS_AREACODE, CUS_PHONE, CARD_NUM
FROM CUSTOMER, ASSIGNMENT, CARD
WHERE CUSTOMER.CUS_ID = ASSIGNMENT.CUS_ID
AND ASSIGNMENT.ASSIGN_CODE = CARD.ASSIGN_CODE
AND CARD.EXPIR_DATE >= '09-DEC-2020';
```

CUS_LNAME	CUS_FNAME	CUS_INITIAL	CUS_AREACODE	CUS_PHONE	CARD_NUM
Lombard	Paul	L	320	767-9575	4243507034864858
Jacobo	Nicole	N	320	487-8946	4142507034864858
Jane	Doe	-	869	679-8943	4243570034864858
Jane	Doe	-	869	679-8943	4243507034864059

Download CSV

4 rows selected.

Query 3

We would like to see accounts that are not active, and the customers associated with those accounts

```
SELECT CUS_LNAME, CUS_FNAME, CUS_PHONE, BANK_ACCOUNT.ACCT_NUM, ACTIV_STATUS
FROM CUSTOMER, BANK_ACCOUNT, ASSIGNMENT
WHERE CUSTOMER.CUS_ID = ASSIGNMENT.CUS_ID
AND BANK_ACCOUNT.ACCT_NUM = ASSIGNMENT.ACCT_NUM
AND BANK_ACCOUNT.ACTIV_STATUS != 'ACTIVE';
```

CUS_LNAME	CUS_FNAME	CUS_INITIAL	ACCT_NUM	ACTIV_STATUS
Jacobo	Nicole	N	742833	OVERDRAWN
John	Doe	-	742833	OVERDRAWN
Jane	Doe	-	333390	INACTIVE
Abigail	Ayoko	-	795894	OVERDRAWN

Download CSV

4 rows selected.