

CS331-H01 Group06;
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Phase 2

NOTE: Assignment due date extension received from professor due to sickness

Write SQL statements to create database and tables

```
CREATE TABLE ACCOUNT (  
    Account_number CHAR(5) NOT NULL,  
    Balance INTEGER NOT NULL,  
    Date_accessed DATE NOT NULL,  
    PRIMARY KEY (Account_number)  
);  
  
CREATE TABLE BRANCH (  
    Branch_id CHAR(3) NOT NULL,  
    Name VARCHAR(20) NOT NULL,  
    Street_address VARCHAR(50) NOT NULL,  
    City VARCHAR(20) NOT NULL,  
    State CHAR(2) NOT NULL,  
    Zip_code CHAR(5) NOT NULL,  
    Manager_SSN CHAR(9),  
    Assistant_manager_SSN CHAR(9),  
    PRIMARY KEY (Branch_id)  
);  
  
CREATE TABLE EMPLOYEE (  
    SSN CHAR(9) NOT NULL,  
    First VARCHAR(15) NOT NULL,  
    Minit CHAR(1),  
    Last VARCHAR(15) NOT NULL,  
    Telephone_number CHAR(10) NOT NULL,  
    Start_date DATE NOT NULL,  
    Super_SSN CHAR(9),  
    Branch_id CHAR(3),  
    PRIMARY KEY (SSN)  
);  
  
CREATE TABLE DEPENDENT (  
    Employee_SSN CHAR(9) NOT NULL,  
    Name VARCHAR(25) NOT NULL,  
    PRIMARY KEY (Employee_SSN, Name),  
    FOREIGN KEY (Employee_SSN) REFERENCES EMPLOYEE (SSN)  
    ON DELETE CASCADE  
);
```

```

CREATE TABLE CUSTOMER (
    SSN CHAR(9) NOT NULL,
    First VARCHAR(15) NOT NULL,
    Minit CHAR(1),
    Last VARCHAR(15) NOT NULL,
    Apartment_number VARCHAR(7),
    Street_number VARCHAR(4) NOT NULL,
    Street VARCHAR(50) NOT NULL,
    City VARCHAR(20) NOT NULL,
    State CHAR(2) NOT NULL,
    Zip_code CHAR(5) NOT NULL,
    Personal_banker_SSN CHAR(9),
    PRIMARY KEY (SSN),
    FOREIGN KEY (Personal_banker_SSN) REFERENCES EMPLOYEE (SSN)
    ON DELETE SET NULL
);

CREATE TABLE TRANSACT (
    Transaction_id CHAR(5) NOT NULL,
    Code CHAR(2) NOT NULL,
    Datetime TIMESTAMP NOT NULL,
    Amount INTEGER NOT NULL,
    Account_number CHAR(5) NOT NULL,
    PRIMARY KEY (Transaction_id),
    FOREIGN KEY (Account_number) REFERENCES ACCOUNT (Account_number)
    ON DELETE CASCADE
);

CREATE TABLE HOLDS (
    Customer_SSN CHAR(9),
    Acct_number CHAR(5),
    PRIMARY KEY (Customer_SSN, Acct_number),
    FOREIGN KEY (Customer_SSN) REFERENCES CUSTOMER (SSN)
    ON DELETE CASCADE,
    FOREIGN KEY (Acct_number) REFERENCES ACCOUNT (Account_number)
    ON DELETE CASCADE
);

```

```
CREATE TABLE LOAN (  
    Account_number CHAR(5) NOT NULL,  
    Interest_rate INTEGER NOT NULL,  
    Loan_number CHAR(5) NOT NULL UNIQUE,  
    Loan_amount INTEGER NOT NULL,  
    Monthly_payment_amount INTEGER NOT NULL,  
    Branch_id CHAR(3),  
    PRIMARY KEY (Account_number),  
    FOREIGN KEY (Account_number) REFERENCES ACCOUNT (Account_number)  
    ON DELETE CASCADE,  
    FOREIGN KEY (Branch_id) REFERENCES BRANCH (Branch_id)  
    ON DELETE SET NULL  
);  
  
CREATE TABLE SAVINGS (  
    Account_number CHAR(5) NOT NULL,  
    Interest_rate INTEGER NOT NULL,  
    PRIMARY KEY (Account_number),  
    FOREIGN KEY (Account_number) REFERENCES ACCOUNT (Account_number)  
    ON DELETE CASCADE  
);  
  
CREATE TABLE CHECKING (  
    Account_number CHAR(5) NOT NULL,  
    Overdrafts INTEGER NOT NULL,  
    PRIMARY KEY (Account_number),  
    FOREIGN KEY (Account_number) REFERENCES ACCOUNT (Account_number)  
    ON DELETE CASCADE  
);  
  
CREATE TABLE MONEY_MARKET (  
    Account_number CHAR(5) NOT NULL,  
    Interest_rate INTEGER NOT NULL,  
    PRIMARY KEY (Account_number),  
    FOREIGN KEY (Account_number) REFERENCES ACCOUNT (Account_number)  
    ON DELETE CASCADE  
);
```

```

ALTER TABLE BRANCH
ADD FOREIGN KEY (Manager_SSN) REFERENCES EMPLOYEE (SSN)
ON DELETE SET NULL;

ALTER TABLE BRANCH
ADD FOREIGN KEY (Assistant_manager_SSN) REFERENCES EMPLOYEE (SSN)
ON DELETE SET NULL;

ALTER TABLE EMPLOYEE
ADD FOREIGN KEY (Super_SSN) REFERENCES EMPLOYEE (SSN)
ON DELETE SET NULL;
ALTER TABLE EMPLOYEE
ADD FOREIGN KEY (Branch_id) REFERENCES BRANCH (Branch_id)
ON DELETE SET NULL;

```

Insert at least 5 rows of data in each table

```

ALTER SESSION SET NLS_DATE_FORMAT = 'DD-MON-YYYY';

INSERT INTO ACCOUNT VALUES ('00001', 1000, '18-JUN-2022');
INSERT INTO ACCOUNT VALUES ('00002', 2000, '20-JUN-2022');
INSERT INTO ACCOUNT VALUES ('00003', 3000, '27-JUN-2022');
INSERT INTO ACCOUNT VALUES ('00004', 4000, '17-JUL-2022');
INSERT INTO ACCOUNT VALUES ('00005', 5000, '18-JUL-2022');
INSERT INTO ACCOUNT VALUES ('00006', 6000, '19-JUL-2022');
INSERT INTO ACCOUNT VALUES ('00007', 7000, '24-JUL-2022');
INSERT INTO ACCOUNT VALUES ('00008', 8000, '25-JUL-2022');
INSERT INTO ACCOUNT VALUES ('00009', 9000, '29-JUL-2022');
INSERT INTO ACCOUNT VALUES ('00010', 10000, '01-AUG-2022');
INSERT INTO ACCOUNT VALUES ('00011', 11000, '26-SEP-2022');
INSERT INTO ACCOUNT VALUES ('00012', 12000, '03-OCT-2022');
INSERT INTO ACCOUNT VALUES ('00013', 13000, '04-OCT-2022');
INSERT INTO ACCOUNT VALUES ('00014', 14000, '09-OCT-2022');
INSERT INTO ACCOUNT VALUES ('00015', 15000, '12-OCT-2022');
INSERT INTO ACCOUNT VALUES ('00016', 16000, '18-OCT-2022');
INSERT INTO ACCOUNT VALUES ('00017', 17000, '20-OCT-2022');
INSERT INTO ACCOUNT VALUES ('00018', 18000, '21-OCT-2022');
INSERT INTO ACCOUNT VALUES ('00019', 19000, '22-OCT-2022');
INSERT INTO ACCOUNT VALUES ('00020', 20000, '3-NOV-2022');

SELECT * FROM ACCOUNT;

```

	ACCOUNT_NUMBER	BALANCE	DATE_ACCESSED
1	00001	1000	18-JUN-2022
2	00002	2000	20-JUN-2022
3	00003	3000	27-JUN-2022
4	00004	4000	17-JUL-2022
5	00005	5000	18-JUL-2022
6	00006	6000	19-JUL-2022
7	00007	7000	24-JUL-2022
8	00008	8000	25-JUL-2022
9	00009	9000	29-JUL-2022
10	00010	10000	01-AUG-2022
11	00011	11000	26-SEP-2022
12	00012	12000	03-OCT-2022
13	00013	13000	04-OCT-2022
14	00014	14000	09-OCT-2022
15	00015	15000	12-OCT-2022
16	00016	16000	18-OCT-2022
17	00017	17000	20-OCT-2022
18	00018	18000	21-OCT-2022
19	00019	19000	22-OCT-2022
20	00020	20000	03-NOV-2022

```

INSERT INTO BRANCH VALUES ('001', 'South Salem', '223 Appleton Street',
'Salem', 'MA', '01970', NULL, NULL);
INSERT INTO BRANCH VALUES ('002', 'North Salem', '543 Pear Street',
'Salem', 'MA', '01970', NULL, NULL);
INSERT INTO BRANCH VALUES ('003', 'East Salem', '784 Orange Street',
'Salem', 'MA', '01970', NULL, NULL);
INSERT INTO BRANCH VALUES ('004', 'Newark', '100 High Street',
'Newark', 'NJ', '07102', NULL, NULL);
INSERT INTO BRANCH VALUES ('005', 'New Brunswick', '120 Low Street',
'New Brunswick', 'NJ', '08901', NULL, NULL);

ALTER SESSION SET NLS_DATE_FORMAT = 'DD-MON-YYYY';

INSERT INTO EMPLOYEE VALUES ('000000001', 'Bruce', 'T', 'Wayne', '111111111',
'24-JAN-2021', NULL, '001');
INSERT INTO EMPLOYEE VALUES ('000000002', 'Richard', 'L', 'Grayson', '222222222',
'18-FEB-2021', '000000001', '001');
INSERT INTO EMPLOYEE VALUES ('000000003', 'Clark', 'S', 'Kent', '333333333',
'17-MAR-2021', NULL, '002');
INSERT INTO EMPLOYEE VALUES ('000000004', 'Diana', 'W', 'Prince', '444444444',
'26-MAY-2021', '000000003', '002');
INSERT INTO EMPLOYEE VALUES ('000000005', 'Tony', 'I', 'Stark', '555555555',
'09-JUL-2021', NULL, '003');
INSERT INTO EMPLOYEE VALUES ('000000006', 'Bruce', 'H', 'Banner', '666666666',
'19-JUL-2021', '000000005', '003');
INSERT INTO EMPLOYEE VALUES ('000000007', 'Thor', 'O', 'Odinson', '777777777',
'28-JUL-2021', NULL, '004');
INSERT INTO EMPLOYEE VALUES ('000000008', 'Loki', 'O', 'Odinson', '888888888',
'31-JUL-2021', '000000007', '004');
INSERT INTO EMPLOYEE VALUES ('000000009', 'Peter', 'S', 'Parker', '999999999',
'19-AUG-2021', NULL, '005');
INSERT INTO EMPLOYEE VALUES ('000000010', 'Flash', 'L', 'Thompson', '1010101010',
'20-AUG-2021', '000000009', '005');

UPDATE BRANCH SET Manager_SSN = '000000001', Assistant_manager_SSN = '000000002'
WHERE Branch_id = '001';
UPDATE BRANCH SET Manager_SSN = '000000003', Assistant_manager_SSN = '000000004'
WHERE Branch_id = '002';
UPDATE BRANCH SET Manager_SSN = '000000005', Assistant_manager_SSN = '000000006'
WHERE Branch_id = '003';
UPDATE BRANCH SET Manager_SSN = '000000007', Assistant_manager_SSN = '000000008'
WHERE Branch_id = '004';
UPDATE BRANCH SET Manager_SSN = '000000009', Assistant_manager_SSN = '000000010'
WHERE Branch_id = '005';

SELECT * FROM BRANCH;
SELECT * FROM EMPLOYEE;

```

BRANCH_ID	NAME	STREET_ADDRESS	CITY	STATE	ZIP_CODE	MANAGER_SSN	ASSISTANT_MANAGER_SSN
1 001	South Salem	223 Appleton Street	Salem	MA	01970	000000001	000000002
2 002	North Salem	543 Pear Street	Salem	MA	01970	000000003	000000004
3 003	East Salem	784 Orange Street	Salem	MA	01970	000000005	000000006
4 004	Newark	100 High Street	Newark	NJ	07102	000000007	000000008
5 005	New Brunswick	120 Low Street	New Brunswick	NJ	08901	000000009	000000010

SSN	FIRST	MINIT	LAST	TELEPHONE_NUMBER	START_DATE	SUPER_SSN	BRANCH_ID
1 000000001	Bruce	T	Wayne	1111111111	24-JAN-2021	(null)	001
2 000000002	Richard	L	Grayson	2222222222	18-FEB-2021	000000001	001
3 000000005	Tony	I	Stark	5555555555	09-JUL-2021	(null)	003
4 000000006	Bruce	H	Banner	6666666666	19-JUL-2021	000000005	003
5 000000007	Thor	O	Odinson	7777777777	28-JUL-2021	(null)	004
6 000000008	Loki	O	Odinson	8888888888	31-JUL-2021	000000007	004
7 000000009	Peter	S	Parker	9999999999	19-AUG-2021	(null)	005
8 000000010	Flash	L	Thompson	1010101010	20-AUG-2021	000000009	005
9 000000003	Clark	S	Kent	3333333333	17-MAR-2021	(null)	002
10 000000004	Diana	W	Prince	4444444444	26-MAY-2021	000000003	002

```

INSERT INTO DEPENDENT VALUES ('000000001', 'Tim');
INSERT INTO DEPENDENT VALUES ('000000001', 'Jason');
INSERT INTO DEPENDENT VALUES ('000000001', 'Barbara');
INSERT INTO DEPENDENT VALUES ('000000001', 'Ace');
INSERT INTO DEPENDENT VALUES ('000000001', 'Jim');

```

```

SELECT * FROM DEPENDENT;

```

	EMPLOYEE_SSN	NAME
1	000000001	Tim
2	000000001	Jason
3	000000001	Barbara
4	000000001	Ace
5	000000001	Jim


```
INSERT INTO CUSTOMER VALUES ('100000000', 'Himothy', 'W', 'Wins', NULL, '432',  
'Rainbow Road', 'Florence', 'MA', '45223', '000000002');  
INSERT INTO CUSTOMER VALUES ('200000000', 'Thomas', 'R', 'Jefferson', NULL, '578',  
'Stain Lane', 'Happytown', 'MA', '45224', '000000002');  
INSERT INTO CUSTOMER VALUES ('300000000', 'Bejamin', 'E', 'Franklin', NULL, '598',  
'Candy Road', 'Greenville', 'MA', '45225', '000000002');  
INSERT INTO CUSTOMER VALUES ('400000000', 'John', 'P', 'Adams', NULL, '403',  
'Pacman Avenue', 'Whoville', 'MA', '45226', '000000001');  
INSERT INTO CUSTOMER VALUES ('500000000', 'Barrack', 'O', 'Obama', NULL, '306',  
'Lake Avenue', 'Auburn', 'MA', '45227', '000000001');
```

```
INSERT INTO HOLDS VALUES ('100000000', '00001');  
INSERT INTO HOLDS VALUES ('100000000', '00002');  
INSERT INTO HOLDS VALUES ('100000000', '00003');  
INSERT INTO HOLDS VALUES ('100000000', '00004');  
INSERT INTO HOLDS VALUES ('200000000', '00005');  
INSERT INTO HOLDS VALUES ('200000000', '00006');  
INSERT INTO HOLDS VALUES ('200000000', '00007');  
INSERT INTO HOLDS VALUES ('200000000', '00008');  
INSERT INTO HOLDS VALUES ('300000000', '00009');  
INSERT INTO HOLDS VALUES ('300000000', '00010');  
INSERT INTO HOLDS VALUES ('300000000', '00011');  
INSERT INTO HOLDS VALUES ('300000000', '00012');  
INSERT INTO HOLDS VALUES ('400000000', '00013');  
INSERT INTO HOLDS VALUES ('400000000', '00014');  
INSERT INTO HOLDS VALUES ('400000000', '00015');  
INSERT INTO HOLDS VALUES ('400000000', '00016');  
INSERT INTO HOLDS VALUES ('500000000', '00017');  
INSERT INTO HOLDS VALUES ('500000000', '00018');  
INSERT INTO HOLDS VALUES ('500000000', '00019');  
INSERT INTO HOLDS VALUES ('500000000', '00020');
```

```
SELECT * FROM CUSTOMER;  
SELECT * FROM HOLDS;
```

	⚡ CUSTOMER_SSN	⚡ ACCT_NUMBER
1	1000000000	00001
2	1000000000	00002
3	1000000000	00003
4	1000000000	00004
5	2000000000	00005
6	2000000000	00006
7	2000000000	00007
8	2000000000	00008
9	3000000000	00009
10	3000000000	00010
11	3000000000	00011
12	3000000000	00012
13	4000000000	00013
14	4000000000	00014
15	4000000000	00015
16	4000000000	00016
17	5000000000	00017
18	5000000000	00018
19	5000000000	00019
20	5000000000	00020

```

INSERT INTO LOAN VALUES('00001', 8, '10101', 100000, 5000, '001');
INSERT INTO LOAN VALUES('00005', 9, '50505', 200000, 10000, '001');
INSERT INTO LOAN VALUES('00009', 8, '90909', 300000, 15000, '001');
INSERT INTO LOAN VALUES('00013', 9, '13013', 400000, 20000, '001');
INSERT INTO LOAN VALUES('00017', 8, '17017', 500000, 25000, '001');

```

```

INSERT INTO SAVINGS VALUES('00002', 2);
INSERT INTO SAVINGS VALUES('00006', 3);
INSERT INTO SAVINGS VALUES('00010', 2);
INSERT INTO SAVINGS VALUES('00014', 3);
INSERT INTO SAVINGS VALUES('00018', 2);

```

```

INSERT INTO CHECKING VALUES('00003', 0);
INSERT INTO CHECKING VALUES('00007', 2);
INSERT INTO CHECKING VALUES('00011', 0);
INSERT INTO CHECKING VALUES('00015', 1);
INSERT INTO CHECKING VALUES('00019', 0);

```

```

INSERT INTO MONEY_MARKET VALUES('00004', 8);
INSERT INTO MONEY_MARKET VALUES('00008', 7);
INSERT INTO MONEY_MARKET VALUES('00012', 8);
INSERT INTO MONEY_MARKET VALUES('00016', 7);
INSERT INTO MONEY_MARKET VALUES('00020', 8);

```

```

SELECT * FROM LOAN;
SELECT * FROM SAVINGS;
SELECT * FROM CHECKING;
SELECT * FROM MONEY_MARKET;

```

	ACCOUNT_NUMBER	INTEREST_RATE	LOAN_NUMBER	LOAN_AMOUNT	MONTHLY_PAYMENT_AMOUNT	BRANCH_ID
1	00001	8	10101	100000	5000	001
2	00005	9	50505	200000	10000	001
3	00009	8	90909	300000	15000	001
4	00013	9	13013	400000	20000	001
5	00017	8	17017	500000	25000	001

	ACCOUNT_NUMBER	INTEREST_RATE
1	00002	2
2	00006	3
3	00010	2
4	00014	3
5	00018	2

	ACCOUNT_NUMBER	OVERDRAFTS
1	00003	0
2	00007	2
3	00011	0
4	00015	1
5	00019	0

	ACCOUNT_NU...	INTEREST_RATE
1	00004	8
2	00008	7
3	00016	7
4	00020	8
5	00012	8

```

INSERT INTO TRANSACT VALUES('11111', 'CD', CURRENT_TIMESTAMP, 100, '00003');
INSERT INTO TRANSACT VALUES('22222', 'WD', CURRENT_TIMESTAMP, 5, '00003');
INSERT INTO TRANSACT VALUES('33333', 'CD', CURRENT_TIMESTAMP, 200, '00003');
INSERT INTO TRANSACT VALUES('44444', 'WD', CURRENT_TIMESTAMP, 10, '00003');
INSERT INTO TRANSACT VALUES('55555', 'CD', CURRENT_TIMESTAMP, 300, '00003');

SELECT * FROM TRANSACT;

```

	TRANSACTION_ID	CODE	DATETIME	AMOUNT	ACCOUNT_NUMBER
1	11111	CD	15-NOV-2022	100	00003
2	22222	WD	15-NOV-2022	5	00003
3	33333	CD	15-NOV-2022	200	00003
4	44444	WD	15-NOV-2022	10	00003
5	55555	CD	15-NOV-2022	300	00003

Write SQL statements to update 1 column and delete 1 row for each table

```

UPDATE ACCOUNT SET BALANCE = 1500 WHERE Account_number = '00001';
DELETE FROM ACCOUNT WHERE Account_number = '00002';

UPDATE BRANCH SET Name = 'Southern Salem' WHERE Branch_id = '001';
DELETE FROM BRANCH WHERE Branch_id = '001';

UPDATE CHECKING SET Overdrafts = 0 WHERE Account_number = '00003';
DELETE FROM CHECKING WHERE Account_number = '00007';

UPDATE CUSTOMER SET First = 'Tom' WHERE SSN = '200000000';
DELETE FROM CUSTOMER WHERE SSN = '300000000';

UPDATE DEPENDENT SET Name = 'Timothy' WHERE Employee_SSN = '000000001' AND Name = 'Tim';
DELETE FROM DEPENDENT WHERE name = 'Jason';

UPDATE EMPLOYEE SET Telephone_number = '1234567891' WHERE SSN = '000000001';
DELETE FROM EMPLOYEE WHERE SSN = '000000002';

UPDATE HOLDS SET Customer_SSN = '200000000' WHERE Customer_SSN = '100000000'
AND Acct_number = '00001';
DELETE FROM HOLDS WHERE Customer_SSN = '100000000' AND Acct_number = '00002';

UPDATE LOAN SET Loan_amount = 150000 WHERE Loan_number = '10101';
DELETE FROM LOAN WHERE Account_number = '00017';

UPDATE MONEY_MARKET SET Interest_rate = 9 WHERE Account_number = '00004';
DELETE FROM MONEY_MARKET WHERE Account_number = '00012';

UPDATE SAVINGS SET INTEREST_RATE = 4 WHERE Account_number = '00002';
DELETE FROM SAVINGS WHERE Account_number = '00018';

UPDATE TRANSACT SET Amount 150 WHERE Transaction_id = '11111';
DELETE FROM TRANSACT WHERE Transaction_id = '55555';

```

Write four queries, in English & SQL (show a screen dump or SNIP that shows the SQL code and the result)

1 contains GROUP BY

Retrieve the names of customers along with how many accounts they hold

```
SELECT C.First, COUNT(*)
FROM CUSTOMER C, HOLDS H
WHERE C.SSN = H.Customer_SSN
GROUP BY C.First;
```

	FIRST	COUNT(*)
1	Thomas	4
2	Bejamin	4
3	Himothy	4
4	John	4
5	Barrack	4

1 contains GROUP BY and HAVING

Retrieve the names of employees who are personal bankers for more than two customers

```
SELECT E.First, COUNT(*)
FROM CUSTOMER C, EMPLOYEE E
WHERE C.Personal_banker_SSN = E.SSN
GROUP BY E.First
HAVING COUNT(*) > 2
```

	FIRST	COUNT(*)
1	Richard	3

1 contains nested query with ALL

Retrieve the name of the employee who is responsible for all the dependents

```

SELECT E.First
FROM EMPLOYEE E
WHERE E.SSN = ALL
      (SELECT D.Employee_SSN
       FROM DEPENDENT D);

```

	FIRST
1	Bruce

1 contains nested query with IN

Retrieve the account numbers of all accounts held by a customer with the first name "Himothy"

```

SELECT A.Account_number
FROM ACCOUNT A
WHERE A.Account_number IN
      (SELECT H.Acct_number
       FROM CUSTOMER C, HOLDS H
       WHERE C.SSN = H.Customer_SSN AND C.First = 'Himothy');

```

	ACCOUNT_NUMBER
1	00001
2	00002
3	00003
4	00004