Presentation: Views
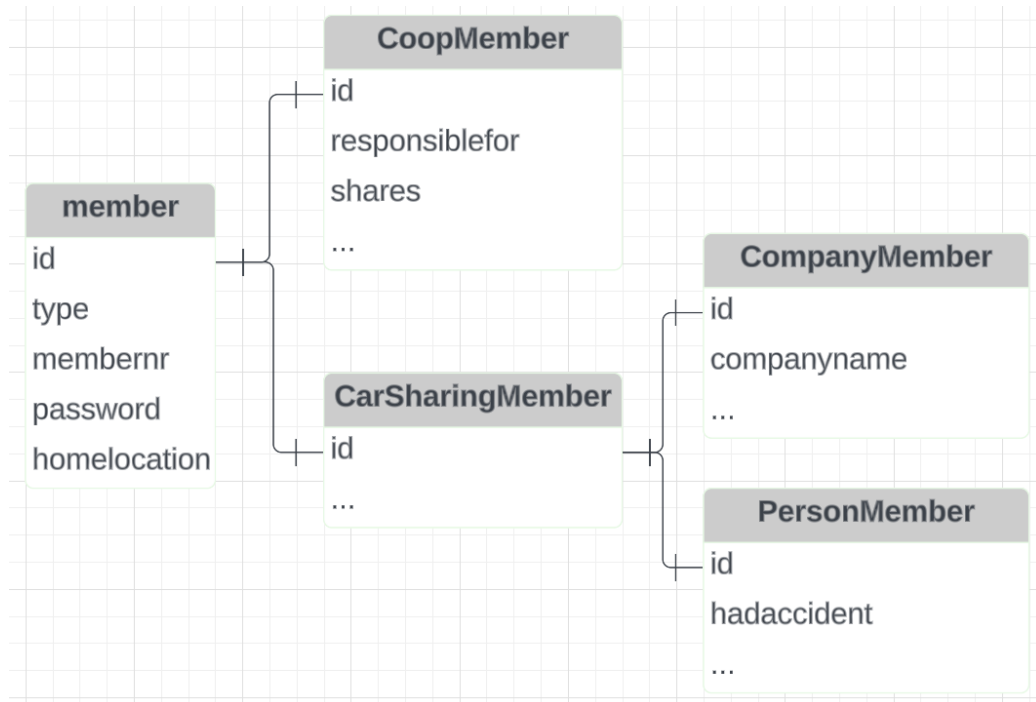
Database Lab HS23

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View for all members-v1

"A **view** that shows all attributes of all tables in the member specialization hierarchy


```sql
CREATE OR REPLACE VIEW member_View_1 AS
SELECT
    m.*,
    m1.address AS m1_address,
    m1.bankaccount AS m1_bankaccount, m1.firstname AS m1_firstname,
    m1.lastname AS m1_lastname, m1.dateofbirth AS m1_dateofbirth,
    m1.responsiblefor AS m1_responsiblefor, m1.shares AS m1_shares,
    m2.address AS m2_address,
    m2.bankaccount AS m2_bankaccount, m2.companyname AS m2_companyname,
    m3.address AS m3_address,
    m3.bankaccount AS m3_bankaccount, m3.firstname AS m3_firstname,
    m3.lastname AS m3_lastname, m3.dateofbirth AS m3_dateofbirth,
    m3.hadaccident AS m3_hadaccident
FROM
    cash.member AS m
LEFT JOIN
    cash.coopmember AS m1 ON m.id = m1.id
LEFT JOIN
    cash.CompanyMember AS m2 ON m.id = m2.id
LEFT JOIN
    cash.PersonMember AS m3 ON m.id = m3.id;
```

Problem

- Meet requirements but have many duplicated columns

- E.g. 'address' occurs three times (red line)

```
CREATE OR REPLACE VIEW member_View_1 AS
SELECT
    m.*,
    m1.address AS m1_address,
    m1.bankaccount AS m1_bankaccount, m1.firstname AS m1_firstname,
    m1.lastname AS m1_lastname, m1.dateofbirth AS m1_dateofbirth,
    m1.responsiblefor AS m1_responsiblefor, m1.shares AS m1_shares,
    m2.address AS m2_address,
    m2.bankaccount AS m2_bankaccount, m2.companyname AS m2_companyname,
    m3.address AS m3_address,
    m3.bankaccount AS m3_bankaccount, m3.firstname AS m3_firstname,
    m3.lastname AS m3_lastname, m3.dateofbirth AS m3_dateofbirth,
    m3.hadaccident AS m3_hadaccident
FROM
    cash.member AS m
LEFT JOIN
    cash.coopmember AS m1 ON m.id = m1.id
LEFT JOIN
    cash.CompanyMember AS m2 ON m.id = m2.id
LEFT JOIN
    cash.PersonMember AS m3 ON m.id = m3.id;
```

View for all members - v2

Use **COALESCE** to
reduce duplicated columns

```sql
CREATE OR REPLACE VIEW member_View_2 AS
SELECT
    m.*,
    COALESCE(m1.address, m2.address, m3.address) AS address,
    COALESCE(m1.bankaccount, m2.bankaccount, m3.bankaccount) AS bankaccount,
    COALESCE(m1.firstname, m3.firstname) AS firstname,
    COALESCE(m1.lastname, m3.lastname) AS lastname,
    COALESCE(m1.dateofbirth, m3.dateofbirth) AS dateofbirth,
    m1.responsiblefor AS m1_responsiblefor,
    m1.shares AS m1_shares,
    m2.companyname AS m2_companyname,
    m3.hadaccident AS m3_hadaccident
FROM
    cash.member AS m
LEFT JOIN
    cash.coopmember AS m1 ON m.id = m1.id
LEFT JOIN
    cash.CompanyMember AS m2 ON m.id = m2.id
LEFT JOIN
    cash.PersonMember AS m3 ON m.id = m3.id;
```

View for all members - v3

Identify all columns in the view. Create these columns for each sub table. Use **Union** to combine them.

- id
- Type
- Membernr
- password
- homelocation
- Address
- Bankaccount
- Firstname
- Lastname
- Dateofbirth
- Responsiblefor
- Shares
- Companyname
- headaccident

```sql
CREATE OR REPLACE VIEW member_View_3 AS
SELECT
        t1.*,
        t.address,t.bankaccount,t.firstname,t.lastname,t.dateofbirth,
        t.m1_responsiblefor,t.m1_shares,t.m2_companyname,t.m3_hadaccident
FROM
    cash.member as t1
LEFT JOIN (
    SELECT
        m1.id, m1.address,m1.bankaccount,m1.firstname,m1.lastname,m1.dateofbirth,
        m1.responsiblefor AS m1_responsiblefor,m1.shares AS m1_shares,
        NULL::character AS m2_companyname,NULL::boolean AS m3_hadaccident
    FROM cash.coopmember as m1

    UNION

    SELECT
        m2.id, m2.address, m2.bankaccount,NULL::character AS firstname,NULL::character AS lastna
        NULL::date AS dateofbirth,NULL::integer AS m1_responsiblefor,
        NULL::numeric AS m1_shares,m2.companyname, NULL::boolean AS m3_hadaccident
    FROM cash.CompanyMember AS m2

    UNION

    SELECT
        m3.id, m3.address,m3.bankaccount,m3.firstname,m3.lastname,m3.dateofbirth,
        NULL::integer AS m1_responsiblefor,NULL::numeric AS m1_shares,
        NULL::character AS m2_companyname,m3.hadaccident
    FROM cash.PersonMember AS m3
) AS t on t.id=t1.id
```
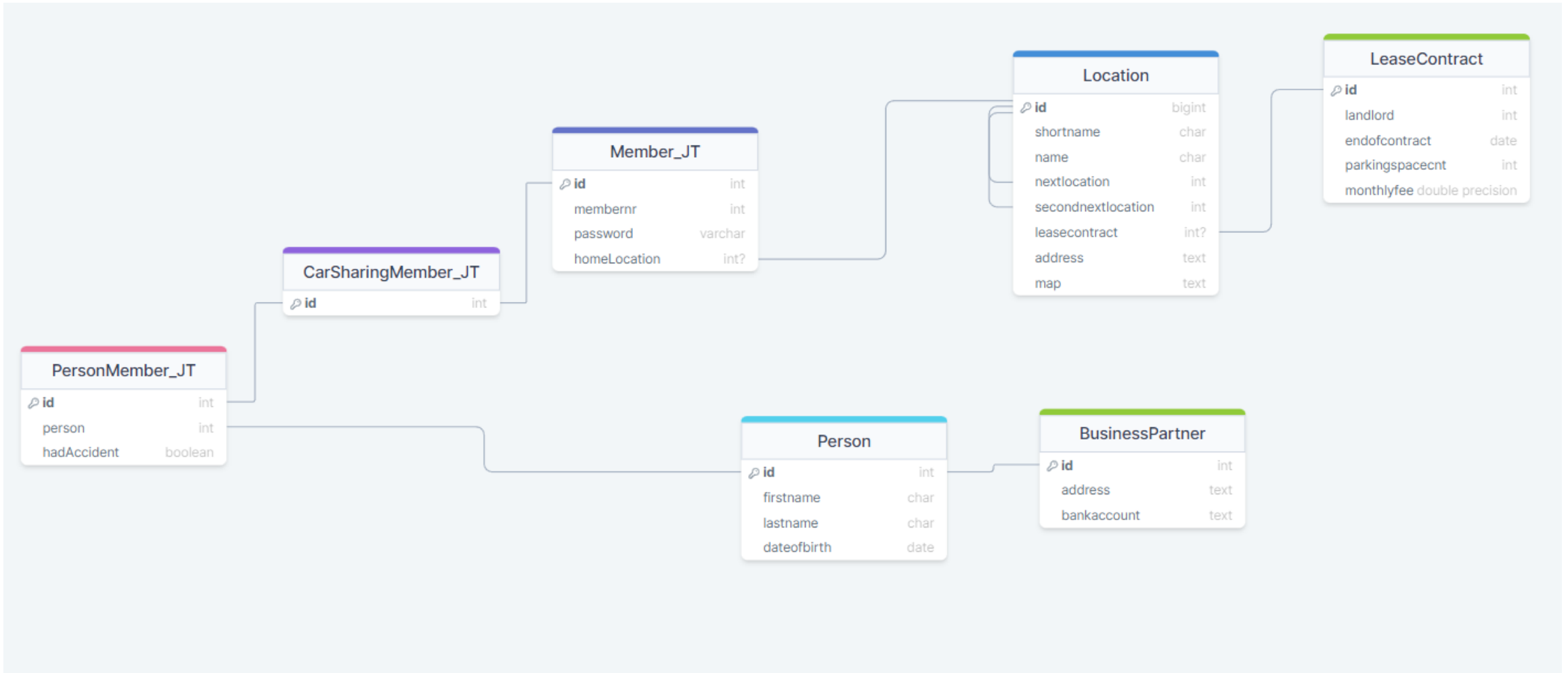
Query Result

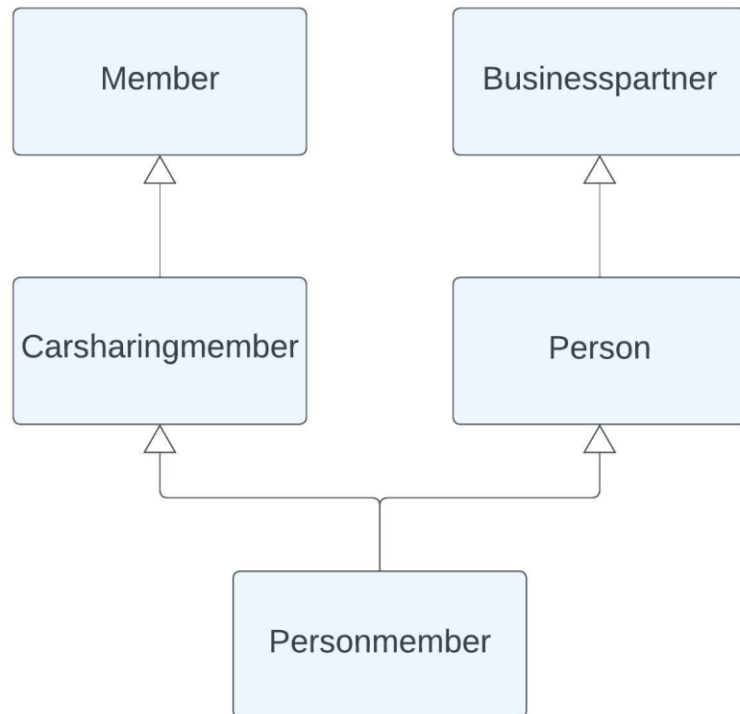| id integer 🔒	type character var	membernr integer 🔒	password character var	homelocation integer	address cash.addresst 🔒	bankaccount cash.bankacc	firstname character var	lastname character var	dateofbirth date 🔒	m1_responsik integer	m1_shares numeric (7,2)	m2_company character var	m3_hadaccid boolean
1008	PersonM…	1000	luckyluke	1000	("The Woods …	("Wells Fa…	Luca	Geppert	1997-12-20	[null]	[null]	[null]	false
1009	PersonM…	1001	just4now	1000	("The Woods …	("Zuerche…	Jonathan	Geppert	1994-07-08	[null]	[null]	[null]	false
1010	PersonM…	1002	just4now	1000	(Hirzerenstra…	(UBS,458…	Freddie	Freeloader	1994-09-09	[null]	[null]	[null]	true
1011	PersonM…	1003	just4now	1005	(Hauptstrass…	(UBS,458…	Klaus	Dittrich	1960-09-09	[null]	[null]	[null]	false
1012	PersonM…	1004	just4now	1001	(Milchbuckst…	(UBS,458…	Bjoern	Malmstro…	1980-09-09	[null]	[null]	[null]	false
1013	PersonM…	1005	just4now	1001	(Stuessistras…	(UBS,458…	Sharon	McCone	1980-09-09	[null]	[null]	[null]	false
1014	PersonM…	1006	db2wizard	1002	(Lindhofstras…	(CS,23-05…	Daniel	Roth	1974-09-05	[null]	[null]	[null]	false
1015	PersonM…	1007	linux	1003	("Capitol Exp…	("Money L…	Pig	Ben	1974-09-05	[null]	[null]	[null]	true
1016	PersonM…	1008	just4now	1003	(Zuercherstra…	(UBS,545…	Lucky	Luke	1960-09-09	[null]	[null]	[null]	false

Inheritance Schema for PersonMember_JT

View for PersonMembers (including implicit relationship with Person)

"A **view** that shows all the attributes for **PersonMembers** (i.e., including the inherited ones)."


```sql
CREATE VIEW PersonMemberV AS
SELECT
    pm.id,
    pm.person,
    cp.firstname || ' ' || cp.lastname AS personname,
    cp.bankaccount,
    cp.dateofbirth,
    pm.hadAccident,
    mm.membernr,
    mm.password,
    mm.homelocation,
    cl.shortname,
    cl.name,
    cl.nextlocation,
    cl.secondnextlocation,
    cl.leasecontract,
    cl.address,
    cl.map,
    clc.landlord,
    clc.endofcontract,
    clc.parkingspacecnt,
    clc.monthlyfee
FROM
    personmember_jt as pm
JOIN
    cash.person as cp on pm.id = cp.id
JOIN
    carsharingmember_jt csm on pm.id = csm.id
JOIN
    member_jt mm on pm.id = mm.id
LEFT JOIN
    cash.location cl on mm.homelocation = cl.id
LEFT JOIN
    cash.leasecontract clc on cl.id = clc.id;
```
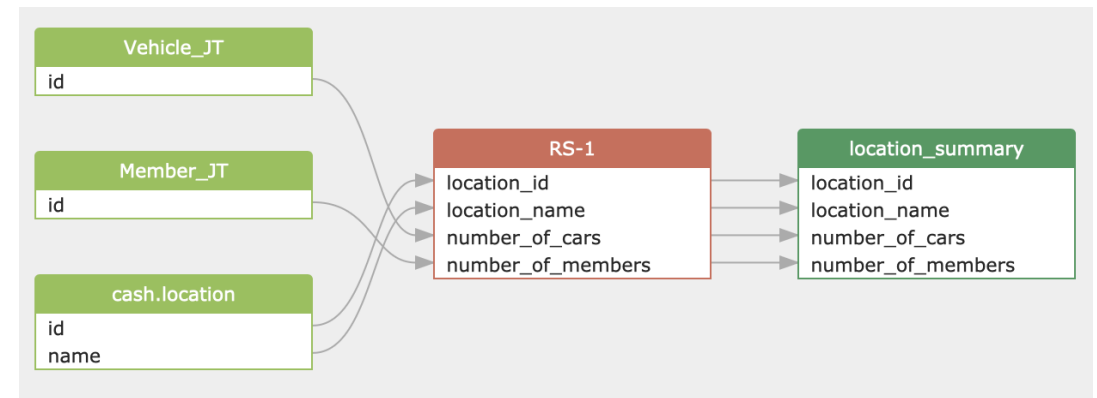
Query Result

	id integer	person integer	personname text	bankaccount cash.bankaccountt	dateofbirth date	hadaccident boolean	membernr integer	password character varying (15)	homelocation integer	shortname character	name character varying (20)	nextlocation integer	secondnextlocation integer	leasecontract integer	address cash.addresst	map bytea	landlord integer	endofcontract date	parkingspacecnt integer	monthlyfee numeric (7,2)
1	1024	1024	Wyatt Earp	(UBS,895353,328)	1963-03-03	false	1016	gugus	1008	zrh	Zurich	1004	1007	1007	(Bahnhofstrasse,101,8000,Zuerich)	[binary dat...	1000	2024-12-31	10	900.00
2	1008	1008	Luca Geppert	("Wells Fargo",23-056-900,2049)	1997-12-20	false	1000	luckyluke	1000	grs	Greifensee	1005	1006	1005	("The Woods Drive",34,8606,Greifensee)	[binary dat...	1000	2024-12-31	5	400.00
3	1009	1009	Jonathan Geppert	("Zuercher Kartonbank",458677892,3328)	1994-07-08	false	1001	just4now	1000	grs	Greifensee	1005	1006	1005	("The Woods Drive",34,8606,Greifensee)	[binary dat...	1000	2024-12-31	5	400.00
4	1010	1010	Freddie Freeloader	(UBS,458677892,3328)	1994-09-09	true	1002	just4now	1000	grs	Greifensee	1005	1006	1005	("The Woods Drive",34,8606,Greifensee)	[binary dat...	1000	2024-12-31	5	400.00
5	1025	1025	Butch Cassidy	(UBS,895353,328)	1963-03-03	false	1017	gugus	1008	zrh	Zurich	1004	1007	1007	(Bahnhofstrasse,101,8000,Zuerich)	[binary dat...	1000	2024-12-31	10	900.00
6	1011	1011	Klaus Dittrich	(UBS,458688892,2008)	1960-09-09	false	1003	just4now	1005	swb	Schwerzenbach	1004	1000	1003	("500 Harry Road",224,8001,Schwerzenbach)	[binary dat...	1000	2024-12-31	5	400.00
7	1012	1012	Bjoern Malmstroe...	(UBS,45844892,3288)	1980-09-09	false	1004	just4now	1001	irc	Zurich-Irchel	1007	1003	1001	(Winterthurerstrasse,197,8057,Irchel)	[binary dat...	1000	2023-12-31	8	600.00
8	1013	1013	Sharon McCone	(UBS,45844892,3288)	1980-09-09	false	1005	just4now	1001	irc	Zurich-Irchel	1007	1003	1001	(Winterthurerstrasse,197,8057,Irchel)	[binary dat...	1000	2023-12-31	8	600.00
9	1037	1037	Martin Beck	(UBS,40074892,3228)	1940-09-09	true	1029	just4now	1008	zrh	Zurich	1004	1007	1007	(Bahnhofstrasse,101,8000,Zuerich)	[binary dat...	1000	2024-12-31	10	900.00
10	1014	1014	Daniel Roth	(CS,23-056-900,548)	1974-09-05	false	1006	db2wizard	1002	moe	Moenchaltorf	1006	1000	1006	("Im Winkel",4,69123,Moenchaltorf)	[binary dat...	1000	2023-12-31	2	180.00
11	1015	1015	Pig Ben	("Money Launderers Inc.",23-056-900,1024)	1974-09-05	true	1007	linux	1003	oer	Zurich-Oerlikon	1001	1007	1000	(Gubelstrasse,6,8011,Zuerich)	[binary dat...	1000	2023-12-31	8	400.00
12	1016	1016	Lucky Luke	(UBS,54587892,328)	1960-09-09	false	1008	just4now	1003	oer	Zurich-Oerlikon	1001	1007	1000	(Gubelstrasse,6,8011,Zuerich)	[binary dat...	1000	2023-12-31	8	400.00
13	1017	1017	Billy The Kid	(BofA,23-056-900,2048)	1972-09-05	true	1009	garlic!	1004	see	Zurich-Seefeld	1008	1007	1004	(Dufourstrasse,175,8008,Zuerich)	[binary dat...	1000	2023-12-31	4	400.00
14	1018	1018	Doc Holiday	("Wells Fargo",23-056-888,2049)	1972-09-05	true	1010	just4now	1004	see	Zurich-Seefeld	1008	1007	1004	(Dufourstrasse,175,8008,Zuerich)	[binary dat...	1000	2023-12-31	4	400.00
15	1019	1019	Al Capone	(UBS,21218905,328)	1979-07-08	true	1011	just4now	1006	ust	Uster	1000	1002	1008	(Centralstrasse,9,8610,Uster)	[binary dat...	1000	2024-12-31	4	160.00
16	1020	1020	Kristian Weiser	(BfG,11-111-234,4711)	1996-12-30	false	1012	bubblegum	1007	wip	Zurich-Wipkingen	1008	1001	1002	(Weizenstrasse,6,8037,Zuerich)	[binary dat...	1000	2023-12-31	10	1500.00
17	1021	1021	Wolfgang Lehner	("Wells Fargo",23-056-777,2049)	1968-05-05	false	1013	just4now	1006	ust	Uster	1000	1002	1008	(Centralstrasse,9,8610,Uster)	[binary dat...	1000	2024-12-31	4	160.00
18	1022	1022	Kat Colorado	(UBS,45844892,3288)	1980-09-09	false	1014	just4now	1008	zrh	Zurich	1004	1007	1007	(Bahnhofstrasse,101,8000,Zuerich)	[binary dat...	1000	2024-12-31	10	900.00
19	1023	1023	Sam Spade	(UBS,45844892,3288)	1980-09-09	true	1015	just4now	1008	zrh	Zurich	1004	1007	1007	(Bahnhofstrasse,101,8000,Zuerich)	[binary dat...	1000	2024-12-31	10	900.00
20	32496	32496	Henry Gondorff	("Bankster Brothers",1234567,5432)	1950-10-10	false	1031	qwerty	1006	ust	Uster	1000	1002	1008	(Centralstrasse,9,8610,Uster)	[binary dat...	1000	2024-12-31	4	160.00
21	32497	32497	Johnny Hooker	("Bankster Brothers",2345678,5432)	1958-08-08	true	1032	qwerty	1006	ust	Uster	1000	1002	1008	(Centralstrasse,9,8610,Uster)	[binary dat...	1000	2024-12-31	4	160.00
22	32498	32498	Doyle Lonnegan	("Money Launderers Inc.",2345678,1024)	1951-01-02	true	1033	qwerty	[null]	[null]	[null]	[null]	[null]	[null]	[null]	[null]	[null]	[null]	[null]	[null]
23	32499	32499	Jill McBain	("Baddest Bank of America",3456789,2048)	1961-04-11	false	1034	qwerty	[null]	[null]	[null]	[null]	[null]	[null]	[null]	[null]	[null]	[null]	[null]
24	32500	32500	Cincinnati Kid	("Baddest Bank of America",4567890,2048)	1953-02-20	true	1035	qwerty	1008	zrh	Zurich	1004	1007	1007	(Bahnhofstrasse,101,8000,Zuerich)	[binary dat...	1000	2024-12-31	10	900.00

Location Summary View

"A **view** that shows the **locations** together with the **number of cars** at this location and the **number of members** having this location as their **home location**

```sql
CREATE VIEW location_summary
SELECT
    location.id AS location_id,
    location.name AS location_name,
    COUNT(DISTINCT Vehicle_JT.id) AS number_of_cars,
    COUNT(DISTINCT Member_JT.id) AS number_of_members
FROM
    cash.location
LEFT JOIN Vehicle_JT ON location.id = Vehicle_JT.home
LEFT JOIN Member_JT ON location.id = Member_JT.homeLocation
GROUP BY
    location.id,
    location.name;
```


View: location_summary

	location_id integer	location_name character varying (20)	number_of_cars bigint	number_of_members bigint
1	1000	Greifensee	5	5
2	1001	Zurich-Irchel	5	2
3	1002	Moenchaltorf	4	2
4	1003	Zurich-Oerlikon	3	2

[…]