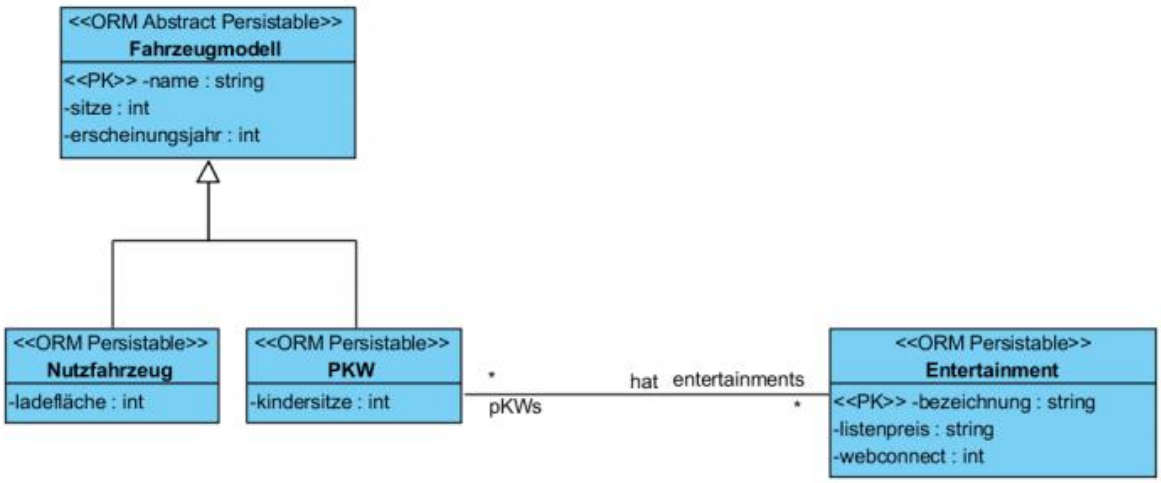
Ausarbeitung Übung 03

Abbildung Generalisierung



Die Generalisierung ist *complete*, da das Fahrzeugmodell als abstrakte Klasse modelliert ist. Sie ist außerdem *disjoint*, da ein Modell laut Angabe in beide Sparten PKW **und** Nutzfahrzeug fallen kann. Beim Einrelationenmodell wäre die Beziehung **hat** polymorph, was gegen die Modellierung spricht. Durch die Vollständigkeit der Generalisierung bietet sich die volle Redundanz eher schlecht an. Aus der Verbleibenden Auswahl empfinde ich das Partitionierungsmodell als umständlich da für eine Projektion mit allen Attributen mehrere Verbunde notwendig sind. So habe ich mich also für das Basisrelationenmodell entschieden:

Fahrzeugmodell: {[name: string, sitze: int, erscheinungsjahr: int]}

Nutzfahrzeug: {[name: string, sitze: int, erscheinungsjahr: int, ladefläche: int]}

Fahrzeugmodell: {[name: string, sitze: int, erscheinungsjahr: int, kindersitze: int]}

Entertainment: {[bezeichung: string, listenpreis: string, webconnect: int]}

hat: {[name: string, bezeichnung: string]}

Aggregate und Gruppierungen

```
-- 2 a
SELECT department_id, department_name, Count(*)
FROM departments
       INNER JOIN employees USING (department_id)
GROUP BY department_id, department_name
HAVING Count(*) < 3;
```

	DEPARTMENT_ID	DEPARTMENT_NAME	COUNT(*)
1	10	Administration	1
2	110	Accounting	2
3	20	Marketing	2

```
-- 2 b
SELECT department_id, department_name, Count(*)
FROM departments
       INNER JOIN employees USING (department_id)
GROUP BY department_id, department_name
HAVING Count(*) = (SELECT MAX(COUNT(employee_id))
                   FROM departments
                          INNER JOIN employees USING (department_id)
                   GROUP BY department_id);
```

	DEPARTMENT_ID	DEPARTMENT_NAME	COUNT(*)
1	50	Shipping	5

```
-- 2 c
SELECT department_id, department_name, Count(*)
FROM departments
       INNER JOIN employees USING (department_id)
GROUP BY department_id, department_name
HAVING Count(*) = (SELECT MIN(COUNT(employee_id))
                   FROM departments
                          INNER JOIN employees USING (department_id)
                   GROUP BY department_id);
```

	DEPARTMENT_ID	DEPARTMENT_NAME	COUNT(*)
1	10	Administration	1

Aggregate und Gruppierungen

```
-- 3.1 Assumption: The exercise asks for actors who played in multiple films
SELECT first_name, last_name, actor_id
FROM actor
       INNER JOIN film_actor USING (actor_id)
GROUP BY first_name, last_name, actor_id
HAVING (COUNT(*) > 1);
```

	FIRST_NAME	LAST_NAME	ACTOR_ID
1	JAYNE	NEESON	62
2	RIP	WINSLET	68
3	KIRK	JOVOVICH	43
4	VIVIEN	BASINGER	158
5	OLYMPIA	PFEIFFER	171
6	EMILY	DEE	148
7	GEOFFREY	HESTON	151
8	RIP	CRAWFORD	26
9	JUDY	DEAN	35
10	MORGAN	MCDORMAND	114
11	BURT	POSEY	75
12	ANGELINA	ASTAIRE	76
13	RALPH	CRUZ	80
14	BEN	WILLIS	83
15	MEG	HAWKE	97

```
-- 3.2
SELECT title
FROM film
WHERE film_id NOT IN (SELECT film_id FROM inventory);
```

	TITLE
1	ARSENIC INDEPENDENCE
2	DELIVERANCE MULHOLLAND
3	APOLLO TEEN
4	DAZED PUNK
5	TREASURE COMMAND
6	CRYSTAL BREAKING
7	PEARL DESTINY
8	SUICIDES SILENCE
9	PSYCHO SHRUNK
10	FRANKENSTEIN STRANGER
11	PERDITION FARGO
12	RAINBOW SHOCK
13	BOONDOCK BALLROOM
14	HATE HANDICAP
15	KENTUCKIAN GIANT

```
-- 3.3
SELECT r.staff_id, s.store_id, COUNT(*), SUM(amount)
FROM rental r
       INNER JOIN payment USING (rental_id)
       INNER JOIN staff s ON (s.staff_id = r.staff_id)
GROUP BY r.staff_id, s.store_id;
```

	STAFF_ID	STORE_ID	COUNT(*)	SUM(AMOUNT)
1	6	6	911	6454.64
2	5	5	930	6662.75
3	4	4	891	6657.14
4	1	1	6216	45287.33
5	2	2	6178	43965.82
6	3	3	918	6620.07

```
-- 3.4
SELECT first_name, last_name, COUNT(*)
FROM customer
       INNER JOIN rental USING (customer_id)
GROUP BY first_name, last_name
ORDER BY COUNT(*) DESC;
```

	FIRST_NAME	LAST_NAME	COUNT(*)
1	ELEANOR	HUNT	46
2	KARL	SEAL	45
3	MARCIA	DEAN	42
4	CLARA	SHAW	42
5	TAMMY	SANDERS	41
6	WESLEY	BULL	40
7	SUE	PETERS	40
8	MARION	SNYDER	39
9	RHONDA	KENNEDY	39
10	TIM	CARY	39
11	DAISY	BATES	38
12	ELIZABETH	BROWN	38
13	TOMMY	COLLAZO	38
14	CURTIS	IRBY	38
15	JUNE	CARROLL	37

```
-- 3.5
SELECT customer_id, last_name, store_id, SUM(amount)
FROM payment INNER JOIN customer c1 USING (customer_id)
GROUP BY customer_id, last_name, store_id
HAVING SUM(amount) >= ALL (SELECT SUM(amount)
                           FROM payment INNER JOIN customer c2 USING (customer_id)
                           WHERE c1.store_id = c2.store_id
                           GROUP BY customer_id, last_name, store_id);
```

	CUSTOMER_ID	LAST_NAME	STORE_ID	SUM(AMOUNT)
1	75	SANDERS	3	305.88
2	236	DEAN	1	357.39
3	468	CARY	5	327.14
4	408	MURRELL	4	282.32
5	469	BULL	2	342.67
6	144	SHAW	6	322.62

```
-- 3.6
SELECT first_name, last_name, COUNT(*) AS number_of_horror_rental
FROM customer
       INNER JOIN rental USING (customer_id)
       INNER JOIN inventory USING (inventory_id)
       INNER JOIN film_category USING (film_id)
       INNER JOIN category USING (category_id)
WHERE name = 'Horror'
GROUP BY first_name, last_name
HAVING COUNT(*) >= 4
ORDER BY COUNT(*) DESC;
```

	FIRST_NAME	LAST_NAME	NUMBER_OF_HORROR_RENTAL
1	DUANE	TUBBS	5
2	KEN	PREWITT	5
3	KARL	SEAL	5
4	NANCY	THOMAS	5
5	THELMA	MURRAY	5
6	EMMA	BOYD	5
7	ROSEMARY	SCHMIDT	5
8	ANA	BRADLEY	5
9	JOSE	ANDREW	4
10	CARL	ARTIS	4
11	TINA	SIMMONS	4
12	KRISTINA	CHAMBERS	4
13	LOUIS	LEONE	4
14	ZACHARY	HITE	4
15	OSCAR	AQUINO	4

```
-- 3.7
SELECT actor_id, last_name
FROM actor
       INNER JOIN film_actor USING (actor_id)
GROUP BY actor_id, last_name
ORDER BY COUNT(*) DESC
FETCH FIRST 10 ROWS ONLY;
```

	ACTOR_ID	LAST_NAME
1	107	DEGENERES
2	102	TORN
3	198	KEITEL
4	181	CARREY
5	23	KILMER
6	81	DAMON
7	158	BASINGER
8	60	BERRY
9	106	DUNST
10	13	WOOD

```
-- 3.8
SELECT name, category_id, COUNT(*)
FROM category
       INNER JOIN film_category USING (category_id)
       INNER JOIN film USING (film_id)
       INNER JOIN inventory USING (film_id)
GROUP BY category_id, name
ORDER BY COUNT(*) ASC
FETCH FIRST 5 ROWS ONLY;
```

	NAME	CATEGORY_ID	COUNT(*)
1	Music	12	232
2	Travel	16	235
3	Horror	11	248
4	Comedy	5	269
5	Children	3	269

```
-- 3.9
SELECT film_id, title, length, category_id
FROM film
       INNER JOIN film_category USING (film_id)
WHERE (category_id, length) IN (SELECT category_id, MAX(length)
                                FROM film
                                       INNER JOIN film_category fc USING (film_id)
                                GROUP BY category_id)
ORDER BY length ASC
FETCH FIRST 1 ROWS WITH TIES;
```

	FILM_ID	TITLE	LENGTH	CATEGORY_ID
1	344	FURY MURDER	178	3
2	993	WRONG BEHAVIOR	178	3

GROUP BY und ROLLUP

	RATING	NAME	Nr. Of Films	Total Length (All FIlms)
1	G	Music	2	132
2	G	Comedy	11	1364
3	G	<null>	13	1496
4	R	Music	11	1088
5	R	Comedy	8	950
6	R	<null>	19	2038
7	PG	Music	10	1187
8	PG	Comedy	16	1869
9	PG	<null>	26	3056
10	NC-17	Music	20	2260
11	NC-17	Comedy	11	1255
12	NC-17	<null>	31	3515
13	PG-13	Music	8	1129
14	PG-13	Comedy	12	1280
15	PG-13	<null>	20	2409
16	<null>	<null>	109	12514

Figure 1 Ergebnis für alle drei Abfragen

```sql
-- 4.1
SELECT rating, name, COUNT(*) AS "Nr. Of Films", SUM(length) AS "Total Length (All FIlms)"
FROM film
       INNER JOIN film_category USING (film_id)
       INNER JOIN category USING (category_id)
WHERE name IN('Comedy', 'Music')
GROUP BY ROLLUP (rating, name);

-- 4.2
SELECT rating, name, COUNT(*) AS "Nr. Of Films", SUM(length) AS "Total Length (All FIlms)"
FROM film
       INNER JOIN film_category USING (film_id)
       INNER JOIN category USING (category_id)
WHERE name IN('Comedy', 'Music')
GROUP BY GROUPING SETS ( (rating),
                         (name, rating),
                         ());

-- 4.3
SELECT rating, name, COUNT(*) AS "Nr. Of Films", SUM(length) AS "Total Length (All Films)"
FROM film
       INNER JOIN film_category USING (film_id)
       INNER JOIN category USING (category_id)
WHERE name IN('Comedy', 'Music')
GROUP BY rating, name
UNION ALL
SELECT rating, NULL AS name, COUNT(*) AS "Nr. Of Films", SUM(length) AS "Total Length (All Films)"
FROM film
       INNER JOIN film_category USING (film_id)
       INNER JOIN category USING (category_id)
WHERE name IN('Comedy', 'Music')
GROUP BY rating, NULL
UNION ALL
SELECT NULL AS rating, NULL AS name, COUNT(*) AS "Nr. Of Films", SUM(length) AS "Total Length (All Films)"
FROM film
       INNER JOIN film_category USING (film_id)
       INNER JOIN category USING (category_id)
WHERE name IN('Comedy', 'Music');
```

GROUP BY mit CUBE

```
-- 5.1
SELECT manager_staff_id, store_id, SUM(amount)
FROM store s
       INNER JOIN staff USING (store_id)
       INNER JOIN payment USING (staff_id)
GROUP BY CUBE (manager_staff_id, store_id);
```

	MANAGER_STAFF_ID	STORE_ID	SUM(AMOUNT)
1	<null>	<null>	115657.58
2	<null>	1	44694.83
3	<null>	2	44568.15
4	<null>	3	6620.07
5	<null>	4	6657.14
6	<null>	5	6662.75
7	<null>	6	6454.64
8	1	<null>	44694.83
9	1	1	44694.83
10	2	<null>	44568.15
11	2	2	44568.15
12	3	<null>	13074.71
13	3	3	6620.07
14	3	6	6454.64
15	4	<null>	6657.14
16	4	4	6657.14
17	5	<null>	6662.75
18	5	5	6662.75

```
-- 5.2
SELECT manager_staff_id, store_id, SUM(amount),
       GROUPING(manager_staff_id) grp_msi,
       GROUPING(store_id) grp_sid
FROM store s
       INNER JOIN staff USING (store_id)
       INNER JOIN payment USING (staff_id)
GROUP BY CUBE (manager_staff_id, store_id);
```

	MANAGER_STAFF_ID	STORE_ID	SUM(AMOUNT)	GRP_MSI	GRP_SID
1	<null>	<null>	115657.58	1	1
2	<null>	1	44694.83	1	0
3	<null>	2	44568.15	1	0
4	<null>	3	6620.07	1	0
5	<null>	4	6657.14	1	0
6	<null>	5	6662.75	1	0
7	<null>	6	6454.64	1	0
8	1	<null>	44694.83	0	1
9	1	1	44694.83	0	0
10	2	<null>	44568.15	0	1
11	2	2	44568.15	0	0
12	3	<null>	13074.71	0	1
13	3	3	6620.07	0	0
14	3	6	6454.64	0	0
15	4	<null>	6657.14	0	1
16	4	4	6657.14	0	0
17	5	<null>	6662.75	0	1
18	5	5	6662.75	0	0

```
-- 5.3
SELECT manager_staff_id, store_id, staff_id, SUM(amount)
FROM store s
       INNER JOIN staff USING (store_id)
       INNER JOIN payment USING (staff_id)
GROUP BY GROUPING SETS ((manager_staff_id, store_id, staff_id),
                        (manager_staff_id, store_id),
                        (store_id, staff_id));
```

	MANAGER_STAFF_ID	STORE_ID	STAFF_ID	SUM(AMOUNT)
1	1	1	1	44694.83
2	2	2	2	44568.15
3	3	3	3	6620.07
4	4	4	4	6657.14
5	5	5	5	6662.75
6	3	6	6	6454.64
7	<null>	1	1	44694.83
8	<null>	2	2	44568.15
9	<null>	3	3	6620.07
10	<null>	4	4	6657.14
11	<null>	5	5	6662.75
12	<null>	6	6	6454.64
13	5	5	<null>	6662.75
14	3	6	<null>	6454.64
15	4	4	<null>	6657.14
16	1	1	<null>	44694.83
17	2	2	<null>	44568.15
18	3	3	<null>	6620.07

```
-- 5.4
SELECT country, EXTRACT(YEAR FROM payment_date), r.staff_id, sum(amount), count(*)
FROM payment
       INNER JOIN rental r USING (rental_id)
       INNER JOIN staff s ON r.staff_id = s.staff_id
       INNER JOIN inventory i USING (inventory_id)
       INNER JOIN store sto ON sto.store_id = i.store_id
       INNER JOIN address a ON sto.address_id = a.address_id
       INNER JOIN city USING (city_id)
       INNER JOIN country USING (country_id)
GROUP BY GROUPING SETS ( (country_id, country, EXTRACT(YEAR FROM payment_date)),
                         (r.staff_id, EXTRACT(YEAR FROM payment_date)),
                         ());
```

	COUNTRY	EXTRACT(YEARFROMPAYMENT_DATE)	STAFF_ID	SUM(AMOUNT)	COUNT(*)
1	Japan	2013	<null>	626.8	73
2	Japan	2014	<null>	10402.46	1430
3	Japan	2015	<null>	8747.85	1219
4	Egypt	2013	<null>	521.95	62
5	Australia	2013	<null>	465.24	64
6	Canada	2015	<null>	8518.11	1172
7	Austria	2013	<null>	691.94	75
8	Egypt	2015	<null>	9011.33	1272
9	Australia	2014	<null>	9848.39	1383
10	United States	2013	<null>	382.58	55
11	United States	2014	<null>	10199.14	1400
12	Austria	2014	<null>	9544.62	1312
13	Austria	2015	<null>	8659.87	1241
14	Canada	2013	<null>	472.62	59
15	Canada	2014	<null>	9945.86	1371
16	Australia	2015	<null>	8519.39	1192
17	United States	2015	<null>	8648.36	1188
18	Egypt	2014	<null>	10441.24	1476
19	<null>	2013	1	1288.23	153
20	<null>	2013	2	1187.23	164
21	<null>	2013	3	166.54	18
22	<null>	2013	4	266.67	25
23	<null>	2013	5	173.32	18
24	<null>	2013	6	79.14	10
25	<null>	2014	1	23285.06	3201
26	<null>	2014	2	23607.95	3303
27	<null>	2014	3	3518.98	493
28	<null>	2014	4	3391.45	459
29	<null>	2014	5	3288.42	453
30	<null>	2014	6	3289.85	463
31	<null>	2015	1	20714.04	2862
32	<null>	2015	2	19170.64	2711
33	<null>	2015	3	2934.55	407
34	<null>	2015	4	2999.02	407
35	<null>	2015	5	3201.01	459
36	<null>	2015	6	3085.65	438
37	<null>	<null>	<null>	115647.75	16044