Homework 4 Databases Solutions

Problem 1:

```
SELECT
    *
FROM
    mwflights
WHERE
    depa = 'ORD' AND dsta = 'SAW';
```

Result Grid	Filter Rows:	Search	Export:		
departure_time	airline	flightnumber	arrival_time	depa	dsta
10:42:00	MSA	1112	12:09:00	ORD	SAW

Problem 2:

```
SELECT
    fl1.airline,
    fl1.flightnumber,
    fl1.departure_time,
    fl1.arrival_time,
    fl1.dsta,
    fl2.airline,
    fl2.flightnumber,
    fl2.departure_time,
    fl2.arrival_time
FROM
    mwflights fl1
        JOIN
    mwflights fl2 ON fl1.dsta = fl2.depa
WHERE
    fl1.arrival_time < fl2.departure_time
        AND fl1.depa = 'ORD'
        AND fl2.dsta = 'DTW';
```

airline	flightnumber	departure_time	arrival_time	dsta	airline	flightnumber	departure_time	arrival_time
MSA	1106	08:38:00	09:58:00	MKE	WSA	111	13:10:00	14:25:00
MSA	1106	08:38:00	09:58:00	MKE	WSA	112	17:50:00	19:05:00
TJE	1014	13:59:00	14:12:00	MKE	WSA	112	17:50:00	19:05:00
TJE	1014	13:59:00	14:12:00	MKE	WSA	112	17:50:00	19:05:00
MSA	1112	10:42:00	12:09:00	SAW	MLX	107	16:54:00	17:41:00
MSA	1112	10:42:00	12:09:00	SAW	MLX	111	22:13:00	23:00:00
MSA	1106	08:38:00	09:58:00	MKE	WSA	111	13:10:00	14:25:00
MSA	1106	08:38:00	09:58:00	MKE	WSA	112	17:50:00	19:05:00
TJE	1014	13:59:00	14:12:00	MKE	WSA	112	17:50:00	19:05:00
TJE	1014	13:59:00	14:12:00	MKE	WSA	112	17:50:00	19:05:00
MSA	1112	10:42:00	12:09:00	SAW	MLX	107	16:54:00	17:41:00
MSA	1112	10:42:00	12:09:00	SAW	MLX	111	22:13:00	23:00:00
MSA	1103	07:49:00	09:37:00	GRB	MSA	1160	09:40:00	11:25:00
TJE	1010	06:12:00	06:47:00	GRB	MSA	1160	09:40:00	11:25:00
TJE	1010	06:12:00	06:47:00	GRB	MSA	1160	09:40:00	11:25:00
MSA	1105	04:14:00	05:30:00	MSN	MSA	1186	08:27:00	09:28:00
MSA	1107	06:07:00	07:37:00	RHI	MSA	1212	09:05:00	11:00:00
MSA	1111	09:08:00	10:18:00	LAN	MSA	1265	10:26:00	11:51:00

Problem 3:

```
SELECT
    fl1.airline,
    fl1.flightnumber,
    fl1.departure_time,
    fl1.arrival_time,
    fl1.dsta,
    fl2.airline,
    fl2.flightnumber,
    fl2.departure_time,
    fl2.arrival_time
FROM
    mwflights fl1
        JOIN
    mwflights fl2 ON fl1.dsta = fl2.depa
WHERE
    ADDTIME(fl1.arrival_time, '1:30:00') < fl2.departure_time
        AND fl1.depa = 'MKE'
        AND fl2.dsta = 'EAU';
```

Result Grid   Filter Rows: Search   Export:

airline	flightnumber	departure_time	arrival_time	dsta	airline	flightnumber	departure_time	arrival_time
WSA	110	08:30:00	09:45:00	DTW	MLX	204	11:37:00	12:45:00
WSA	110	08:30:00	09:45:00	DTW	MLX	204	11:37:00	12:45:00
WSA	500	08:40:00	09:10:00	LSE	TJE	1001	15:40:00	16:05:00
WSA	500	08:40:00	09:10:00	LSE	TJE	1001	15:40:00	16:05:00
WSA	110	08:30:00	09:45:00	DTW	MLX	204	11:37:00	12:45:00
WSA	110	08:30:00	09:45:00	DTW	MLX	204	11:37:00	12:45:00
WSA	500	08:40:00	09:10:00	LSE	TJE	1001	15:40:00	16:05:00
WSA	500	08:40:00	09:10:00	LSE	TJE	1001	15:40:00	16:05:00
WSA	100	05:30:00	06:17:00	MDW	MSA	1115	08:23:00	09:36:00
WSA	100	05:30:00	06:17:00	MDW	MSA	1115	08:23:00	09:36:00
WSA	120	05:20:00	06:15:00	RFD	MSA	1128	09:30:00	11:14:00
WSA	120	05:20:00	06:15:00	RFD	MSA	1128	09:30:00	11:14:00
WSA	120	05:20:00	06:15:00	RFD	MSA	1128	09:30:00	11:14:00
WSA	120	05:20:00	06:15:00	RFD	MSA	1128	09:30:00	11:14:00
TJE	1015	15:23:00	16:05:00	ORD	TJE	1003	20:55:00	21:30:00
TJE	1015	15:23:00	16:05:00	ORD	TJE	1003	20:55:00	21:30:00
TJE	1015	15:23:00	16:05:00	ORD	TJE	1003	20:55:00	21:30:00
TJE	1015	15:23:00	16:05:00	ORD	TJE	1003	20:55:00	21:30:00
MSA	1199	07:33:00	09:04:00	DTW	MLX	204	11:37:00	12:45:00
MSA	1196	10:15:00	12:00:00	LSE	TJE	1001	15:40:00	16:05:00
MSA	1191	05:42:00	07:41:00	ORD	TJE	1003	20:55:00	21:30:00
MSA	1199	07:33:00	09:04:00	DTW	MLX	204	11:37:00	12:45:00
MSA	1196	10:15:00	12:00:00	LSE	TJE	1001	15:40:00	16:05:00
MSA	1191	05:42:00	07:41:00	ORD	TJE	1003	20:55:00	21:30:00

There are other possible solutions.

Problem 4:

```
SELECT
    fl1.airline,
    fl1.flightnumber,
    fl1.departure_time,
    fl1.arrival_time,
    fl1.dsta,
    fl2.airline,
    fl2.flightnumber,
    fl2.departure_time,
    fl2.arrival_time,
    fl3.airline,
    fl3.flightnumber,
    fl3.departure_time,
    fl3.arrival_time
FROM
    mwflights fl1
        JOIN
    mwflights fl2 ON fl1.dsta = fl2.depa
        JOIN
    mwflights fl3 ON fl2.dsta = fl3.depa
WHERE
    fl1.arrival_time < fl2.departure_time AND
    fl2.arrival_time < fl3.departure_time
        AND fl1.depa = 'ORD'
        AND fl3.dsta = 'DTW';
```

airline	flightn...	departur...	arrival_time	dsta	airline	flightnu...	departure_...	arrival_time	airline	flightnumber	departure_time	arrival_time
TJE	1016	06:04:00	07:01:00	DTW	MSA	1224	08:39:00	10:15:00	WSA	111	13:10:00	14:25:00
TJE	1016	06:04:00	07:01:00	DTW	MSA	1224	08:39:00	10:15:00	WSA	111	13:10:00	14:25:00
MSA	1107	06:07:00	07:37:00	RHI	MSA	1211	09:49:00	11:06:00	WSA	111	13:10:00	14:25:00
TJE	1010	06:12:00	06:47:00	GRB	MSA	1158	09:10:00	11:07:00	WSA	111	13:10:00	14:25:00
TJE	1010	06:12:00	06:47:00	GRB	MSA	1158	09:10:00	11:07:00	WSA	111	13:10:00	14:25:00
MSA	1100	09:15:00	10:25:00	MDW	MSA	1119	10:32:00	12:00:00	WSA	111	13:10:00	14:25:00
TJE	1006	09:12:00	10:12:00	RFD	WSA	507	11:34:00	12:03:00	WSA	111	13:10:00	14:25:00
TJE	1006	09:12:00	10:12:00	RFD	WSA	507	11:34:00	12:03:00	WSA	111	13:10:00	14:25:00
MSA	1101	09:27:00	11:09:00	RFD	WSA	507	11:34:00	12:03:00	WSA	111	13:10:00	14:25:00
MSA	1110	07:31:00	08:39:00	AZO	WSA	122	10:30:00	11:45:00	WSA	111	13:10:00	14:25:00
MSA	1110	07:31:00	08:39:00	AZO	WSA	122	10:30:00	11:45:00	WSA	111	13:10:00	14:25:00
MSA	1100	09:15:00	10:25:00	MDW	WSA	103	11:31:00	12:18:00	WSA	111	13:10:00	14:25:00

There are alternative solutions.

Problem 5:

```
SELECT
    DISTINCT city.city
```

```
FROM
    actor
        JOIN
    film_actor ON actor.actor_id = film_actor.film_id
        JOIN
    film ON film_actor.film_id = film.film_id
        JOIN
    inventory ON inventory.film_id = film.film_id
            JOIN
     rental ON rental.inventory_id = inventory.inventory_id
            JOIN
     customer ON customer.customer_id = rental.customer_id
            JOIN
     address ON address.address_id = customer.address_id
            JOIN
     city ON city.city_id = address.city_id
WHERE
    actor.last_name = 'LOLLOBRIGIDA';
```

Result Grid	Filter Rows: Q Search
city	
Ivanovo	
Okayama	
Kitwe	
Tokat	
Rampur	
Richmond Hill	
Salzburg	
Jhansi	
Smolensk	
York	
Jedda	
al-Manama	

Problem 6:

```
SELECT
    customer.customer_id, address.district
FROM
    customer
        INNER JOIN
    address ON customer.address_id = address.address_id
WHERE
    address.district = 'California' OR address.district = 'Texas';


SELECT
    SUM(payment.amount), caltex.district
FROM
    payment
        INNER JOIN
    (SELECT
```

```
        customer.customer_id , address.district
    FROM
        customer
    INNER JOIN address ON customer.address_id = address.address_id
    WHERE
        address.district = 'California' OR address.district = 'Texas')
caltex
        ON caltex.customer_id = payment.customer_id
    GROUP BY caltex.district;
```

SUM(payment.amou...	district	
1056.48	California	
507.71	Texas	

Problem 7:

```
(SELECT first_name, last_name FROM customer) UNION
(SELECT first_name, last_name FROM actor);
```

Result Grid   Filter Rows:

first_name	last_name	
MARY	SMITH	
PATRICIA	JOHNSON	
LINDA	WILLIAMS	
BARBARA	JONES	
ELIZABETH	BROWN	
JENNIFER	DAVIS	
MARIA	MILLER	
SUSAN	WILSON	
MARGARET	MOORE	
DOROTHY	TAYLOR	
LISA	ANDERS...	
NANCY	THOMAS	

Problem 8:

```
(SELECT first_name FROM customer)
EXCEPT
(SELECT first_name FROM actor);
```

Result Grid | Filter Rows

first_name
PATRICIA
LINDA
BARBARA
ELIZABETH
MARIA
MARGARET
DOROTHY
NANCY
KAREN
BETTY
DONNA
CAROL

Problem 9:

We do a subquery for the customer_id with the highest number of rentals. We order in descending order and limit to three.

```
SELECT customer_id, COUNT(*)
FROM rental
GROUP BY customer_id
ORDER BY COUNT(*) DESC
LIMIT 3;
```

We then use this as a subquery to join with the names:

```
SELECT
    customer.first_name, customer.last_name, best.count
FROM
    customer
        INNER JOIN
    (SELECT
        customer_id, COUNT(*) AS count
    FROM
        rental
    GROUP BY customer_id
    ORDER BY COUNT(*) DESC
    LIMIT 3) best ON customer.customer_id = best.customer_id;
```

first_name	last_name	count	
ELEANOR	HUNT	46	
KARL	SEAL	45	
CLARA	SHAW	42	

Problem 10:

```
SELECT
    MIN(payment.amount) as 'min',
    MAX(payment.amount) as 'max',
    AVG(payment.amount) as 'ave',
    COUNT(payment.amount)
FROM payment;
```

min	max	ave	COUNT(payment.amou...
0.00	11.99	4.201356	16044