

1. Domáca úloha

(a)

SQL:

```
select distinct reziser
from filmy
where reziser in (select herec from obsadenia)
```

Relačná algebra:

$$\Pi_{\text{reziser}}(\text{filmy} \bowtie_{\text{filmy.reziser=obsadenia.herec}} \text{obsadenia})$$

Relačný kalkul:

$(\exists r) F(n, r, d) \ \&$
 $(\exists h) O(n, h, p) \ \& \ (r=h)$

(b)

SQL:

```
select herec from obsadenia
- (select reziser from filmy)
```

Relačná algebra:

$$\Pi_{\text{herec}} \text{obsadenia} - \Pi_{\text{reziser}} \text{filmy}$$

Relačný kalkul:

$(\exists h) O(n, h, p) \ \&$
 $(\forall r) F(n, r, d) \ \& \ (h \neq r)$

(c)

SQL:

```
select nazov from filmy
where (rok<=1969) and (rok>=1960) and
      (nazov in (select nazov from obsadenia where herec='Dustin Hoffman' and
                (nazov in (select nazov from obsadenia where herec='Anne Bancroft'))))
```

Relačná algebra:

$$\Pi_{\text{nazov}} \sigma_{(\text{rok} \leq 1969) \ \& \ (\text{rok} \geq 1960)}$$
$$\left(\left(\Pi_{\text{nazov}} \sigma_{\text{herec}='Anne \ Bancroft'} \text{obsadenia } o1 \right) \bowtie_{o1.\text{nazov}=o2.\text{nazov}} \left(\Pi_{\text{nazov}} \sigma_{\text{herec}='Dustin \ Hoffman'} \text{obsadenia } o2 \right) \right) \bowtie \text{filmy}$$

Relačný kalkul:

$(\exists n, r)$
 $(O(n, r, \text{'Dustin Hoffman'}) \ \& \ O(n, r, \text{'Anne Bancroft'})) \ \&$
 $(x < 1970) \ \& \ (x > 1959)$

(d)

SQL:

```
select herec from obsadenia o, filmy f
where (o.nazov=f.nazov) and (f.reziser='Kurosawa')
group by o.herec
having count(o.herec)=(select count(f1.nazov) from filmy f1 where
f1.reziser='Kurosawa')
```

(e)

SQL:

```
select nazov from recenzie
group by nazov
having count(kritik)>=2
```

(f)

SQL:

```
select nazov
from recenzie r1
where nazov in
(select nazov from recenzie r2
where r1.kritik<>r2.kritik)
```

Relačná algebra:

$$\Pi_{\text{nazov}} \sigma_{r1.kritik \neq r2.kritik} (\text{recenzie } r1 \bowtie (\Pi_{\text{nazov}} \text{recenzie } r2))$$

Relačný kalkul:

$$(\exists k1, n) (\exists k2, n) (R(n, k1, v) \& R(n, k2, v) \& (k1 <> k2))$$

(g)

SQL:

```
select distinct nazov
from recenzie r1, recenzie r2
where (r1.nazov=r2.nazov) and (r1.kritik<>r2.kritik)
```

Relačná algebra:

$$\Pi_{\text{nazov}} (\text{recenzie } r1 \bowtie_{(r1.kritik <> r2.kritik)} \text{recenzie } r2)$$

Relačný kalkul:

$$(\exists k1, n) (\exists k2, n) (R(n, k1, v) \& R(n, k2, v) \& (k1 <> k2))$$

(h)

SQL:

```
select nazov
from recenzie
group by nazov
having count(nazov)=1
```

(i)

SQL:

```
select nazov
from recenzie r1
where nazov not in
(select nazov from recenzie r2
where (r2.nazov=r1.nazov) and (r2.kritik<>r1.kritik))
```

Relačná algebra:

(j)

SQL:

```
select kritik, avg(hodnotenie) as h
from recenzie r1, recenzie r2
where r1.kritik=r2.kritik
```

```
group by kritik
having avg(hodnotenie) > 1
order by h desc
```

(k)

SQL:

```
select nazov, hodn, rok from
  (select nazov, avg(hodnotenie) as hodn, rok from filmy, recenzie
   where filmy.nazov=recenzie.nazov
   group by nazov, rok) A,
  (select nazov, avg(hodnotenie) as hodn, rok from filmy, recenzie
   where filmy.nazov=recenzie.nazov
   group by nazov, rok) B
where (A.nazov=B.nazov) and (a.rok=b.rok)
group by a.nazov, a.hodn, a.rok, b.rok
having a.hodn = max(b.hodn)
```

L)

SQL:

```
select reziser, avg(hodnotenie) from filmy f, recenzie r
where f.nazov in (select nazov from obsadenia where herec = 'Al Pacino') and
f.nazov = r.nazov
group by reziser
```

(m)

SQL

```
SELECT r, AVG(v)
FROM Filmy F, Recenzie R
WHERE F.n IN (SELECT n FROM Obsadenie WHERE h = 'Al Pacino') AND F.n = R.n;
Nie je v poriadku, pretože chýba klauzula GROUP BY
```

(n)

SQL:

```
select a.herec, a.rok from
  (select herec, rok, sum(plat) from filmy f, obsadenia o
   where f.nazov = o.nazov
   group by rok, herec) A,
  (select herec, rok, sum(plat) from filmy f, obsadenia o
   where f.nazov = o.nazov
   group by rok, herec) B
where a.rok=b.rok
group by a.herec, a.rok, a.plat
having a.plat = max (b.plat)
```