Datenbanken
Blatt 3

Gruppe 26

Markus Vieth Christian Stricker

17. Mai 2016

1 Aufgabe

1.1

1.1.1

```
1  π a.Firstname, a.Lastname, d.Firstname, d.Lastname (
2      σ ¬(¬(d.Firstname='Lars' ∧ d.Lastname='von Trier') ∧ ¬(d.Firstname='Michael' ∧ d.Lastname='
           Haneke')) (
3          ρ DirectorId←d.PersonId (ρ d (person))
4          × ρ ActorId←a.PersonId (ρ a (person))
5          ⋈ ρ DirectorId←PersonId (directs)
6          ⋈ ρ ActorId←PersonId (acts)
7      )
8  )
```

Alternative

```
1  π a.Firstname, a.Lastname, d.Firstname, d.Lastname (
2      σ d.Firstname='Lars' ∧ d.Lastname='von Trier' (
3          ρ DirectorId←d.PersonId (ρ d (person))
4          × ρ ActorId←a.PersonId (ρ a (person))
5          ⋈ ρ DirectorId←PersonId (directs)
6          ⋈ ρ ActorId←PersonId (acts)
7      )
8  ) ∪ (
9      σ d.Firstname='Michael' ∧ d.Lastname='Haneke' (
10         ρ DirectorId←d.PersonId (ρ d (person))
11         × ρ ActorId←a.PersonId (ρ a (person))
12         ⋈ ρ DirectorId←PersonId (directs)
13         ⋈ ρ ActorId←PersonId (acts)
14     )
15 )
```

1.1.2

```
1  π c.Name, c.Location, s.Time, s.Price, m.Title (
2      σ s.Time = 2100 (
3          ρ m (movie)
4          ⋈ρ s (screening)
5          ⋈ρ CinemaId←inCinema (screeningRoom)
6          ⋈ρ c (cinema)
7      )
8  )
```

1.1.3

```
1  π person.Firstname, person.Lastname, acts.MovieId (
2      σ acts.PersonId = person.PersonId (
3          acts
4          ×person
5      )
6  ) ÷(
7      π directs.MovieId (
8          σ person.Firstname = 'Quentin' ∧person.Lastname = 'Tarantino' (
9              σ person.PersonId = directs.PersonId (
10                 person
11                 ×directs
12             )
13         )
14     )
15 )
```

2 Aufgabe

2.1

2.1.1

```
π a.Firstname, a.Lastname, d.Firstname, d.Lastname (
    σ d.Firstname = 'Lars' ∧ d.Lastname = 'von Trier' ∧ acts.MovieId = directs.MovieId (
        ρ d (person)
        ⋈ directs)
        × (ρ a (person)
        ⋈ acts
    ) ∪ (
        σ d.Firstname = 'Michael' ∧ d.Lastname = 'Haneke' ∧ acts.MovieId = directs.MovieId (
            ρ d (person)
            ⋈ directs)
            × (ρ a (person)
            ⋈ acts
        )
    )
)
```

2.1.2

```
π Name, Location, Time, Price, Title (
    σ Time=2100 ∧ Date=2016-05-13 (
        screening
        ⋈ (ρ CinemaId ← inCinema (screeningRoom))
        ⋈ movie
    )
)
```

2.1.3

```
π Firstname, Lastname, MovieId (
    ρ person.PersonId = acts.PersonId (
        person
        × acts
    )
) ÷ (
    π MovieId (
        ρ Firstname='Quentin' ∧ Lastname='Tarantino' ∧ person.PersonId = directs.PersonId (
            person
            × directs
        )
    )
)
```

2.2

2.2.1

```
{ [t] |
    ∃ mId, l, f, y ( [mId, t, l, f, y] ∈ movie
        ∧ ∃ pId ([pId, mId] ∈ directs
             ∧ ∃ ln, fn ([pId, ln, fn] ∈ person
                 ∧ fn = 'Friedrich Wilhelm' ∧ ln = 'Murnau'
             )
        )
    )
}
```

2.2.2

```
{ [t] |
    ∃ mId, l, f, y ( [mId, t, l, f, y] ∈ movie
        ∧ ∃ pId ([pId, mId] ∈ directs
            ∧ ∃ ln, fn ([pId, ln, fn] ∈ person
                ∧ fn = 'Tim' ∧ ln = 'Burton'
            )
        )
    )
    ∧¬ (
        ∃ pId, r ([pId,mId,r] ∈ acts
            ∧ ∃ ln, fn ([pId,ln,fn] ∈ person
                ∧ fn = 'Johnny' ∧ ln = 'Depp'
            )
        )
    )
}
```

2.2.3

```
{ [t, n, loc, ti, pr] |
     ∃ mId, l, f, y ( [mId, t, l, f, y] ∈ movie
        ∃ rId, d, len ( [mId, rId, ti, d ,len, pr] ∈ screening
            ∧ d = Today
            ∧ ∃ num, cId ([rId, num, cId] ∈ screeningRoom
                ∧ [cId,n,loc] ∈ cinema
            )
        )
        ∧ ∃ gId ([gId, mId] ∈ hasGenre
            ∧ ∃ gn ([gId, gn] ∈ genre
                ∧ gn = 'Documentary'
            )
        )
    )
}
```