BLATT 8

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Aufgabe 1. `connect to UEBUNG;`

```
CREATE VIEW family (X,Y) AS
WITH MOTHERANCESTRY(Ancestor, Descendant) AS
        ((SELECT Mother, Child FROM MOTHERHOOD) UNION ALL
                (SELECT x.Mother, y.Descendant
                        FROM MOTHERHOOD x, MOTHERANCESTRY y
                        WHERE x.Child = y.Ancestor)),
        FATHERANCESTRY(Ancestor, Descendant) AS
        ((SELECT Father, Child FROM FATHERHOOD) UNION ALL
                (SELECT x.Father, y.Descendant
                        FROM FATHERHOOD x, FATHERANCESTRY y
                        WHERE x.Child = y.Ancestor)),
        ANCESTRY(X,Y) AS
        ((SELECT Ancestor, Descendant FROM MOTHERANCESTRY) UNION
        (SELECT Descendant, Ancestor FROM MOTHERANCESTRY) UNION
        (SELECT Ancestor, Descendant FROM FATHERANCESTRY) UNION
        (SELECT Descendant, Ancestor FROM FATHERANCESTRY)),
        COMMONANCESTRY(X,Y) AS
        (SELECT DISTINCT a.X,b.X FROM ANCESTRY a, ANCESTRY b
                WHERE a.Y = b.Y),
        COMMONANDMARRIAGE(X,Y) AS
                ((SELECT * FROM COMMONANCESTRY) UNION
                        (SELECT MAN, WOMAN FROM married) UNION
                        (SELECT WOMAN, MAN FROM married)),
        RELATED(X, Y) AS
        (SELECT DISTINCT a.X, b.X
                FROM COMMONANDMARRIAGE a, COMMONANDMARRIAGE b
                WHERE a.Y = b.Y)
        (SELECT * FROM RELATED);

terminate;
```

Die enstprechende Anfrage zu "Wieviele Verwandte hat Franziska?" ist `SELECT COUNT(Y) FROM family WHERE X='Franziska';` mit dem Resultat 28.

Aufgabe 2. ad. a

```
WITH REISEN(
        Abflugzeit,
        Endposition,
        Ankunftszeit,
        Route,
        Anzteilstr,
        Gesamtkosten) AS
        ((SELECT
                depTime,
                arrival,
                arrTime,
                cast(departure || ' - ' || fNo AS
                   VARCHAR(60)),
                1,
                price
        FROM flights WHERE departure = 'LBC') UNION
           ALL
        (SELECT
                depTime,
                arrival,
                arrTime,
                cast(departure || ' - ' || tNo AS
                   VARCHAR(60)),
                1,
                price
         FROM rail WHERE departure = 'LBC') UNION ALL
        (SELECT
                r.Abflugzeit,
                f.arrival,
                f.arrTime,
                cast(r.Route ||'->'|| f.departure || '
                   -' || f.fNo AS VARCHAR(60)),
                r.AnzTeilstr + 1,
                r.Gesamtkosten + f.price
        FROM REISEN r, flights f WHERE
                r.Endposition = f.departure AND
                f.arrival <> 'LBC' AND
                f.departure <> 'ALC' AND
                r.Ankunftszeit < f.depTime AND
                r.Anzteilstr < 4) UNION ALL
        (SELECT
                r.Abflugzeit,
                t.arrival,
                t.arrTime,
```

```
            cast(r.Route || '->' || t.departure || '
               -' || t.tNo AS VARCHAR(60)),
            r.AnzTeilstr + 1,
            r.Gesamtkosten + t.price
        FROM REISEN r, rail t WHERE
            r.Endposition = t.departure AND
            t.arrival <> 'LBC' AND
            t.departure <> 'ALC' AND
            r.Ankunftszeit < t.depTime AND
            r.Anzteilstr < 4)
    )
    SELECT DISTINCT Abflugzeit, Endposition,
        Ankunftszeit, Route, Anzteilstr,
        Gesamtkosten
    FROM REISEN WHERE
     Endposition = 'ALC' AND
     Gesamtkosten = (SELECT min(Gesamtkosten) FROM
        REISEN WHERE Endposition = 'ALC') AND
     timestampdiff(8, Ankunftszeit-Abflugzeit) = (
        SELECT min(timestampdiff(8, Ankunftszeit-
         Abflugzeit))
         FROM REISEN WHERE
          Endposition = 'ALC' AND
          Gesamtkosten = (SELECT min(Gesamtkosten)
             FROM REISEN WHERE Endposition = 'ALC'))
              ;
```

ad. b

Aufgabe 3.