Aufgabe 1: MongoDB

```
// test data
db.degprg.insertOne({ _id: "prg1", name: "Program 1", semesters: 6, description: "Lorem Ipsum" });
db.degprg.insertOne({ _id: "prg2", name: "Program 2", semesters: 6, description: "Lorem Ipsum" });
db.students.insertOne({ _id: "mat1", degprg: "prg1", name: "Max Muster", start: "01.01.1970" });
db.students.insertOne({ _id: "mat2", degprg: "prg1", name: "Max Master", start: "01.01.1970" });
db.students.insertOne({ _id: "mat3", degprg: "prg2", name: "Max Masta", start: "01.01.1970" });
db.subjects.insertOne({ _id: "sub1", degprg: "prg1", semester: 1, description: "Lorem Ipsum", ects: 5 });
db.subjects.insertOne({ _id: "sub2", degprg: "prg2", semester: 2, description: "Lorem Ipsum", ects: 10 });
db.subjects.insertOne({ _id: "sub3", degprg: "prg1", semester: 2, description: "Lorem Ipsum", ects: 8 });
db.grades.insertOne({ _id: "rt1", subjectid: "sub1", studentid: "mat1", grade: 3 });
db.grades.insertOne({ _id: "rt2", subjectid: "sub3", studentid: "mat1", grade: 3 });
db.grades.insertOne({ _id: "rt3", subjectid: "sub2", studentid: "mat3", grade: 3 });

// a)
db.degprg.aggregate([{$match: {_id: "prg1"}}, {$lookup: {from:"students", localField: "_id", foreignField: "degprg", as: "students"}}]);

// b)
db.degprg.aggregate([{$match: {_id: "prg1"}}, {$lookup: {from:"subjects", localField: "_id", foreignField: "degprg", as: "subjects"}}]);

// c)
db.students.aggregate([{$match: {_id: "mat1"}}, {$lookup: {from:"grades", localField: "_id", foreignField: "studentid", as: "grades"}}]);

// d)
db.subjects.find({_id: "sub1"}, {_id: 0});
```

Aufgabe 2: Cassandra

```
/* create keyspace */
create keyspace ue07 WITH replication = {'class': 'SimpleStrategy',
    'replication_factor' : 3};
use keyspace ue07;
/* create tables */
create table students ( mat_nr text, first_name text, last_name text, date text,
    prg_id text, primary key(mat_nr));
create table deg_prg ( prg_id text, name text, semesters int, description text,
    primary key(prg_id));
create table subject ( subject_id text, deg_prg text, semester int, description text,
    ects int, primary key(subject_id));
create table grades ( mat_nr text, subject_id text, grade int, primary key(mat_nr,
    subject_id));

/* demo data */
insert into deg_prg (prg_id, name, semesters, description) values ('prg1', 'Program
    1', 4, 'Lorem Ipsum');
insert into deg_prg (prg_id, name, semesters, description) values ('prg2', 'Program
    2', 6, 'Lorem Ipsum');
insert into students (mat_nr, first_name, last_name, date, prg_id) values ('s1111',
    'Max', 'Muster', '01.01.1970', 'prg1');
insert into students (mat_nr, first_name, last_name, date, prg_id) values ('s1112',
    'Max', 'Mustermann', '01.01.1970', 'prg1');
insert into students (mat_nr, first_name, last_name, date, prg_id) values ('s1113',
    'Maxi', 'Mustermann', '01.01.1970', 'prg2');insert into subject (subject_id,
    deg_prg, semester, description, ects) values ('sub1', 'prg1', 2, 'Lorem Ipsum
    sub1', 3);
insert into subject (subject_id, deg_prg, semester, description, ects) values ('sub2',
    'prg1', 2, 'Lorem Ipsum sub2', 2);
insert into subject (subject_id, deg_prg, semester, description, ects) values ('sub3',
    'prg2', 1, 'Lorem Ipsum sub3', 5);
insert into grades (mat_nr, subject_id, grade) values ('s1111', 'sub1', 3);
insert into grades (mat_nr, subject_id, grade) values ('s1111', 'sub2', 2);
insert into grades (mat_nr, subject_id, grade) values ('s1112', 'sub1', 4);
insert into grades (mat_nr, subject_id, grade) values ('s1113', 'sub3', 2);

/* a) */
create index on students(prg_id);
select * from students where prg_id = 'prg1';

/* b) */
create index on subject(deg_prg);
select * from subject where deg_prg = 'prg1';
```

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30
31 /* c) */
32 select * from grades where mat_nr = 's1111';
33
34 /* d) */
35 select * from subject where subject_id = 'sub1';
```