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CS 157A – 04

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HW 1 Written-Part

1. a) The attributes of each relation

Attributes of relation '**Student**' are Name, StudentID, Class, Major.

Attributes for relation '**Course**' are CourseName, CourseID, Credits, Dept.

Attributes for relation '**Grade**' are StudentID, CourseID, Grade

b) The tuples of each relation

Relation Student:

(Brown, 8, 2, CS)

(Smith, 17, 1, MATH)

Relation Course:

(Intro CS, 46, 3, CS)

(Discrete Math, 42, 3, MATH)

Relation Grade:

(8, 46, A)

(8, 42, A-)

(17, 42, C)

c) The components of one tuple from each relation.

Relation Student:

Brown, 8, 2, CS

Relation Course:

Intro CS, 46, 3, CS

Relation Grade:

8, 46, A

d) The relation schema for each relation

Relation **Student**: Student(Name, StudentID, Class, Major)

Relation **Course**: Course(CourseName, CourseID, Credits, Dept.)

Relation **Grade**: Grade(StudentID, CourseID, Grade)

e) The Database schema

```
Student(  
    Name:varchar(20),  
    StudentID:int,  
    Class:int,  
    Major:varchar(20)  
)
```

```
Course(  
    CourseName:string,  
    CourseID:int,  
    Credits:int,  
    Dept:varchar(20)  
)
```

```
Grade(  
    StudentID:int,  
    CourseID:int,
```

Grade:varchar(2)
)

f) A suitable domain for each attribute

Student: Name: varchar(20), StudentID: int, Class: int, Major: varchar(20)

Course: CourseName: string(30), CourseID: int, Credits: int, Dept: varchar(20)

Grade: StudentID: int, CourseID: int, Grade: varchar(2)

g) Another equivalent way to present each relation

Student(StudentID, FName, LName, DateOfBirth)

Course(CourseName, CourseID, Section, InstructorName, Major)

Grade(StudentID, CourseID, GradeSymbol, GradeValue)

2. Additional relation which might be useful for the database of problem 1.

MajorProgram(name, studentID, programID, credits, startyear)

3. Key for each table

Student: Name, StudentID

Course: CourseName, CourseID

Grade: StudentID, CourseID

4. Transcript for terminal operations and results from sqlite

```
sqlite> .databases
main: /Users/ParmeetSingh/Documents/sqlite/hw1.db

sqlite> create table students(LName varchar(20),
...> studentID int not null,
...> Class int not null,
...> Major varchar(20),
...> primary key(studentID));

sqlite> .table
students
```

```

sqlite> insert into students values('Brown', 8, 2, 'CS');
sqlite> insert into students values('Smith', 17, 1, 'MATH');

sqlite> .headers on
sqlite> .mode column

sqlite> select * from students;
LName      studentID  Class    Major
-----
Brown      8          2        CS
Smith      17         1        MATH

sqlite> create table Course(CourseName string(20),
...> CourseID int,
...> Credits int,
...> Dept varchar(20));

sqlite> insert into course values('Intro CS', 46, 3, 'CS');
sqlite> insert into course values('Discrete Math', 42, 3, 'MATH');

sqlite> select * from Course;
CourseName  CourseID  Credits  Dept
-----
Intro CS    46        3        CS
Discrete M  42        3        MATH

sqlite> create table Grade(StudentID int,
...> CourseID int,
...> Grade varchar(2),

sqlite> insert into Grade values(8, 46, 'A');
sqlite> insert into Grade values(8, 42, 'A-');
sqlite> insert into Grade values(17, 42, 'C');

sqlite> select * from grade;
StudentID  CourseID  Grade
-----
8          46        A
8          42        A-
17         42        C

sqlite> .tables
Course      Grade      students

```