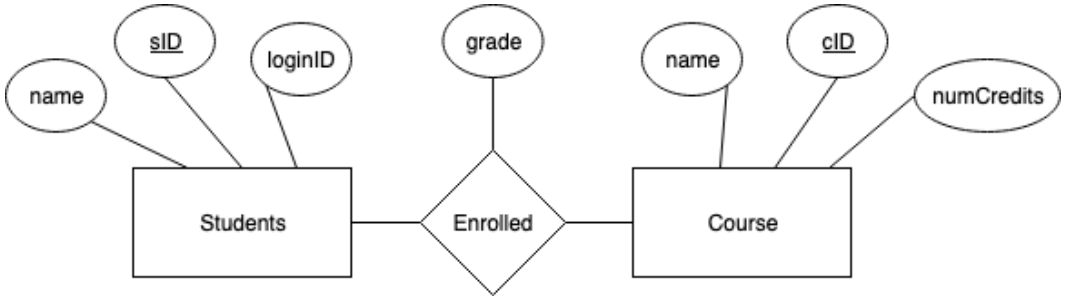
Database Design Exercise Set 2

Question 1

Consider the following ER diagram.



Write the SQL DDL with primary and foreign key constraints to create tables for relations: Student, Course, and Enrolled.

Question 2

Suppose you execute the following SQL statements in sequence. What is the result at the end of each statement? (Note that this syntax is not accepted by all DBMSs; however, based on what we've provided here, the intent should still be clear.)

1. CREATE TABLE r1 (a1 INTEGER, a2 CHAR(20), PRIMARY KEY (a1));
2. CREATE TABLE r2 (a3 INTEGER, a4 DATE, a5 INTEGER, PRIMARY KEY (a3), FOREIGN KEY(a5) REFERENCES r1(a1));
3. INSERT INTO r1 VALUES (111, '111');
4. INSERT INTO r1 VALUES (222, '222');
5. INSERT INTO r2 VALUES (1, '08-JUN-2003', 111);
6. INSERT INTO r2 VALUES (2, '08-JUN-2003', 333);
7. ALTER TABLE r2 ADD a6 CHAR(10);
8. INSERT INTO r2 VALUES (3, '08-JUN-2003', 111, 'a');
9. DELETE FROM r1 WHERE r1.a2 = '111';
10. DROP TABLE r2;

Database Design Exercise Set 2

ANSWERS

Question 1

```
CREATE TABLE student (
        sID NUMBER(12) NOT NULL,
        name CHAR(30) NOT NULL,
        loginID CHAR(20) NOT NULL,
        PRIMARY KEY (sID),
        UNIQUE(loginID)
)

CREATE TABLE course (
        cID NUMBER(12) NOT NULL,
        name CHAR(30) NOT NULL,
        numCredits INTEGER,
        PRIMARY KEY(cID)
)

CREATE TABLE enrolled (
        sID NUMBER(12) NOT NULL,
        cID NUMBER(12) NOT NULL,
        grade NUMBER(5,2),
        PRIMARY KEY(sID, cID),
        FOREIGN KEY(sID) REFERENCES student(sID),
        FOREIGN KEY(cID) REFERENCES course(cID)
)
```

Question 2

- Steps 1 to 5 execute as indicated.
- Step 6 is rejected because 333 does not appear in the a1 column of r1.
- Steps 7 and 8 come through as indicated.
- Step 9 will fail to delete because there is a record in r2 that references 111 which is the key of '111' and the default is "no action".
- Step 10 comes through as indicated.