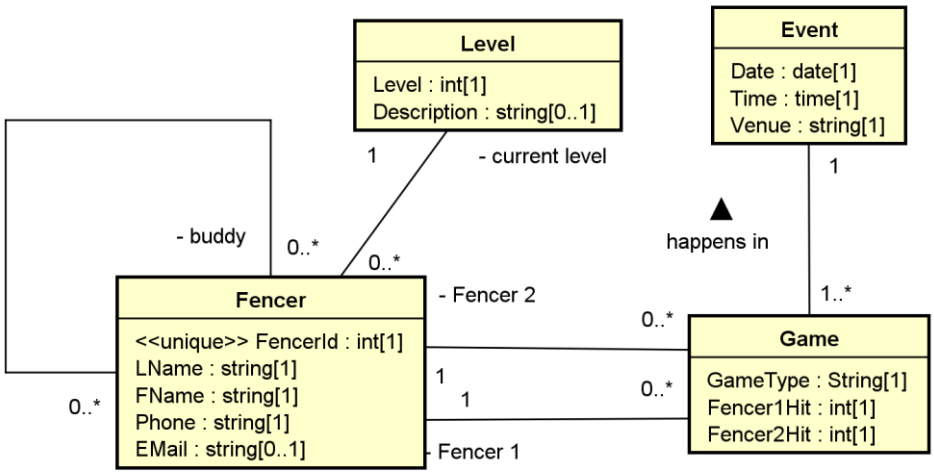
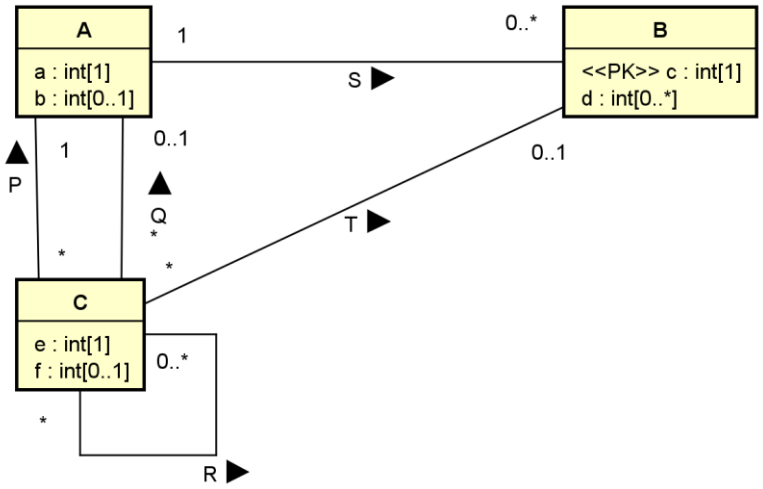
Database Systems
Fall 2025
Suggested Solution to Section 2 Mid-Term Examination

(1) For example (types not needed):



(2) For:



For example:

Relation	A(A_Id, a,b)	**Relation**	B(c, A_Id)
[CK] (1) A_Id [FK] [Nullable] b [Non-nullable] A_Id, a [Note] A surrogate key A_Id is created as the		[CK] (1) c [FK] (1) A_Id references A(A_Id) [Nullable] [Non-nullable] c, A_Id [Note]	

primary key.			
Relation	C(C_Id, e, f, P_a, Q_a, T_c)	**Relation**	BD(BD_Id, c, d)
[CK] (1) C_Id [FK] (1) P_a references A(a), (2) Q_a references A(a), (3) T_c referenes C(c) [Nullable] f, Q_a, T_c [Non-nullable] C_Id, e, P_a, [Note] A surrogate key C_Id is created as the primary key.		[CK] (1) BD_Id, (2) c, d [FK] (1) c references B(c) [Nullable] [Non-nullable] BD_Id, c, d [Note] (optional) A surrogate key BD_Id is created as the primary key.	
Relation	R(R_Id, C_Id_1, C_Id_2)	**Relation**	
[CK] (1) R_Id, C_Id_1, C_Id_2 [FK] (1) C_Id_1 references C(Cid), (2) C_Id_2 references C(Cid) [Nullable] [Non-nullable] R_Id, C_Id_1, C_Id_2 [Note] (optional) A surrogate key R_Id is created as the primary key.		[CK] [FK] [Nullable] [Non-nullable] [Note]	

(3)

(a)	T	(b)	T	(c)	T	(d)	F	(e)	F
(f)	T	(g)	T	(h)	F	(i)	T	(j)	F
(k)	F	(l)	T	(m)	T				

(4)

(a)

```
SELECT DISTINCT s.stuId, s.fname, s.lname,
   d.deptName AS major, e.grade
FROM enroll AS e INNER JOIN student AS s ON (e.stuId = s.stuId)
   LEFT JOIN department AS d ON (s.major = d.deptCode)
WHERE e.classId = 10003;
```

(b)

```
SELECT DISTINCT CONCAT(f.FName, ' ', f.LName) AS faculty,
        d.deptName AS department,
        sc.schoolName AS school
FROM faculty AS f INNER JOIN student AS s ON (f.facId = s.advisor)
        INNER JOIN department AS d ON (f.deptCode = d.deptCode)
        INNER JOIN school AS sc ON (d.schoolCode = sc.schoolCode);

-- Alternately:

SELECT DISTINCT CONCAT(f.FName, ' ', f.LName) AS `active faculty`,
        d.deptName AS department,
```

```
        s.schoolName AS school
FROM faculty AS f INNER JOIN department AS d ON (f.deptCode = d.deptCode)
        INNER JOIN school AS s ON (d.schoolCode = s.schoolCode)
WHERE f.facId IN (SELECT DISTINCT advisor FROM student);
```

(c)

```
SELECT DISTINCT CONCAT(f.FName, ' ', f.LName) AS faculty
FROM faculty AS f INNER JOIN class AS c1 ON (f.facId = c1.facId)
        INNER JOIN course AS co1 ON (c1.courseId = co1.courseId)
        INNER JOIN class AS c2 ON (f.facId = c2.facId)
        INNER JOIN course AS co2 ON (c2.courseId = co2.courseId)
WHERE co1.rubric = 'CINF'
AND co1.number = '3321'
AND co2.rubric = 'CINF'
AND co2.number = '4320';
```