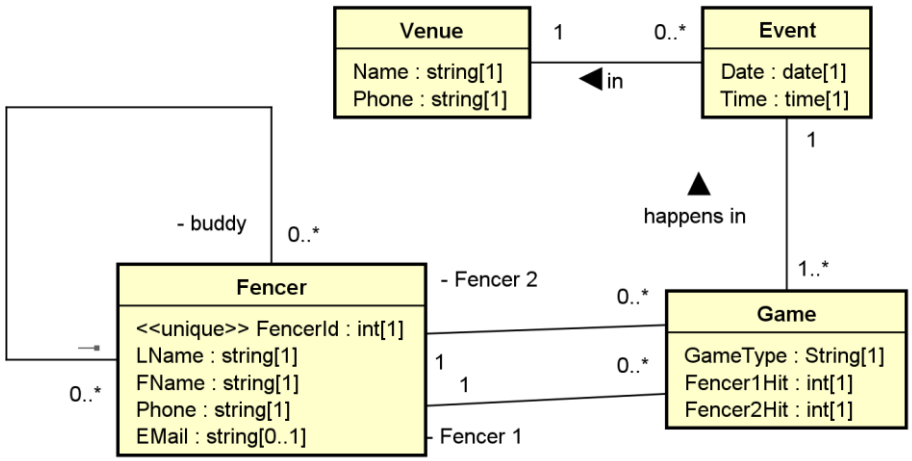
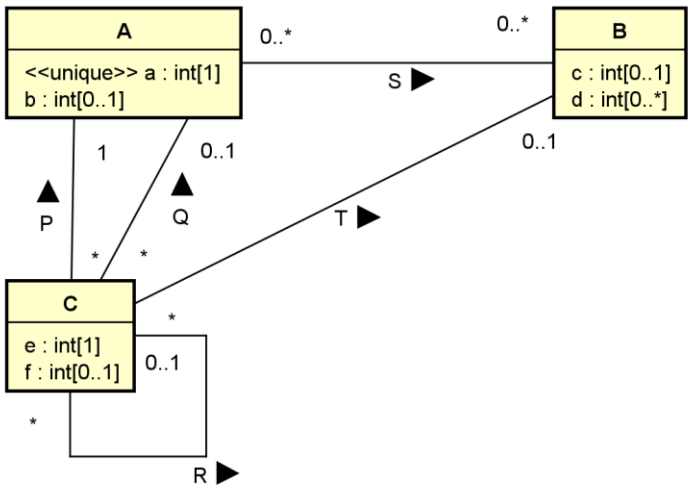
Database Systems
Fall 2025
Suggested Solution to Section 1 Mid-Term Examination

(1) For example (types not needed):



(2) For:



For example:

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

		primary key.	
Relation	C(C_Id, e, f, P_a, Q_a, R_C_Id, T_B_Id)	**Relation**	BD(BD_Id, B_Id, d)
[CK] (1) C_Id [FK] (1) P_a references A(a), (2) Q_a references A(a), (3) R_C_Id references C(C_Id), (4) T_B_Id referenes B(B_Id) [Nullable] f, Q_a, R_C_Id, T_B_Id [Non-nullable] C_Id, e, P_a, [Note] A surrogate key C_Id is created as the primary key.		[CK] (1) BD_Id, (2) B_Id, d [FK] (1) B_Id references B(BId) [Nullable] [Non-nullable] BD_Id, B_Id, d [Note] (optional) A surrogate key BD_Id is created as the primary key.	
Relation	S(S_Id, a, B_Id)	**Relation**	
[CK] (1) S_Id, (2) a, B_Id [FK] (1) a references A(a), (2) B_Id references B(B_Id) [Nullable] [Non-nullable] S_Id, a, B_Id [Note] (optional) A surrogate key S_Id is created as the primary key.		[CK] [FK] [Nullable] [Non-nullable] [Note]	

(3)

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

(4)

(a)

```
SELECT DISTINCT co.title AS course, c.semester, c.year, e.grade
FROM enroll AS e INNER JOIN class AS c ON (e.classId = c.classId)
        INNER JOIN course AS co ON (c.courseId = co.courseId)
WHERE e.stuId = 100000;
```

(b)

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

-- Alternately:

SELECT DISTINCT CONCAT(f.FName, ' ', f.LName) AS 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 facId FROM class);
```

(c)

```
SELECT DISTINCT CONCAT(s.FName, ' ', s.LName) AS student,
   e.grade AS `grade in class 10000`
FROM student AS s INNER JOIN enroll AS e ON (s.stuId = e.stuId)
WHERE e.classId = 10000
AND s.stuId NOT IN (SELECT DISTINCT stuId FROM Enroll WHERE classId = 10002);
```