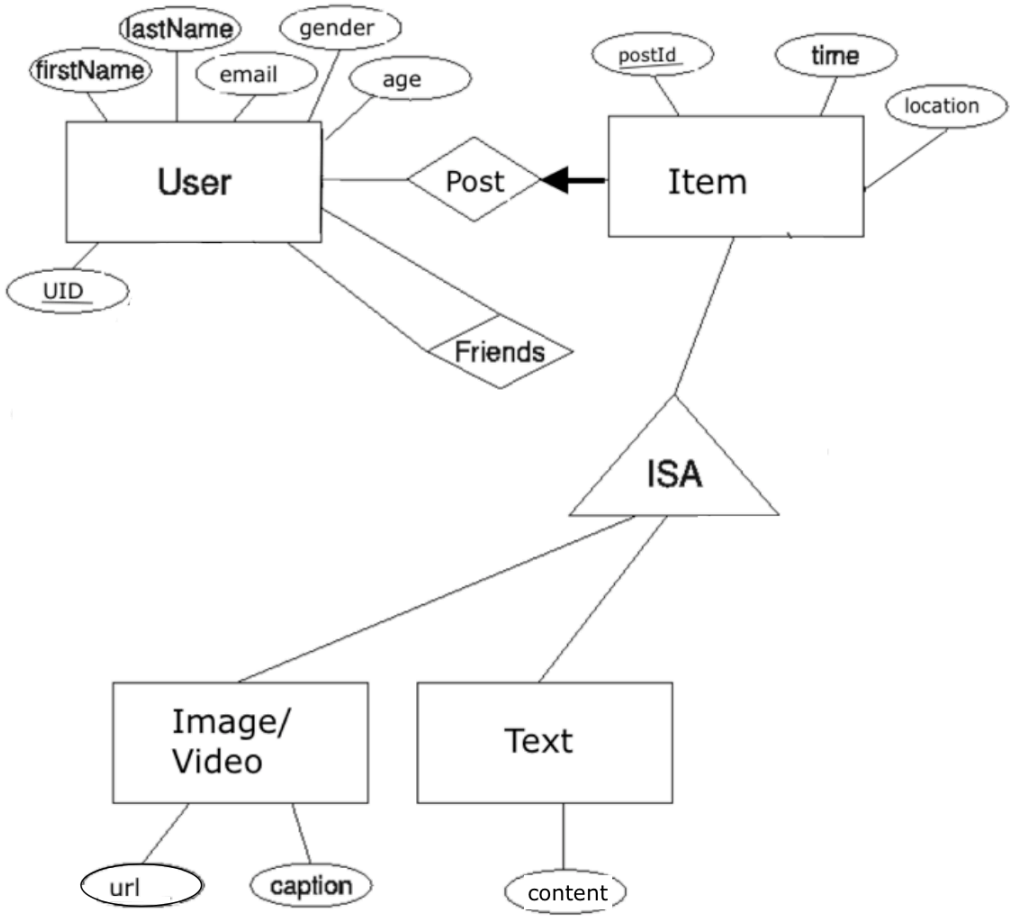
Homework2
CSC 675/CSC 775

Homework 2 will focus on problems from chapters 3, 4 and 5 of the book.

Q1 (24 points) Consider the following ER diagram for an apartment rental application.

Write the SQL-DDL statements, to create tables for the following ER diagram and capture as many of the constraints as possible. Specify your decisions with the foreign key constraint.



CREATE TABLE User(

);

CREATE TABLE ItemPost (

);

CREATE TABLE friends (

);

CREATE TABLE Texts(

);

CREATE TABLE ImageVideo(

);

Q2. (10 points, 2 points each) Assume we have the following instance of table sailors:

sid	*sname*	*rating*	*age*
18	jones	3	30.0
41	jonah	6	56.0
22	ahab	7	44.0
63	moby	*null*	15.0

a. What is the result of this query:
SELECT AVG (S.rating)
FROM Sailors S

b. What is the result of this query:
SELECT SUM (S.rating)
FROM Sailors S

c. What is the result of this query:
SELECT COUNT (S.rating)
FROM Sailors S

d. Show the left outer join of S with itself, with the join condition being sid=sid.

e. Show the right outer join of S with itself, with the join condition being sid=sid.

Q3. (6 points)

a. Which one of the following queries finds sailors who have reserved at

least a boat but not a red boat?

Query1:
```
SELECT  R.sid
FROM    Boats B, Reserves R
WHERE  B.bid=R.bid   AND   B.color<>'red'
```

Query2:
```
SELECT R.sid
FROM   Reserves R
EXCEPT
SELECT R.sid
FROM   Boats B, Reserves R
WHERE  B.bid=R.bid   AND   B.color='red'
```

b. What are the results of query1 and query2 in part A, considering the following instances of Boats and Reserves tables?

SID	BID	DAY
1	101	10-OCT-17
1	104	10-OCT-19
3	101	10-JUL-19
3	102	10-OCT-18
3	103	07-NOV-17

BID	BNAME	COLOR
101	Interlake	blue
102	Interlake	red
103	Clipper	green
104	Marine	red

Q4. (24 points, 6 points each) Consider boat reservation database. Answer these questions using SQL.

a. Find the names of sailors with a higher rating than all sailors who are younger than 20 .

b. Find name of sailors who have not reserved a boat whose name includes the string "Marine".

c. Find the names of sailors who have reserved at least two boats.

d. For each boat reserved by at least 2 sailors older than 20, find the boat id and the average age of such sailors.

Q5. (24 points, 6 points each) Consider the following schema:
Suppliers(sid: integer , sname: string , address: string)
Parts(pid: integer , pname: string , color: string)
Catalog(sid: integer , pid: integer , cost: real)

The Catalog relation lists the prices charged for parts by Suppliers. Write the following queries in SQL:

a. Find the name s of suppliers who supply every red part.

b. Find the sid s of suppliers who supply only red parts.

c. Find the name s of parts supplied by "Acme Suppliers" and no one else.

d. Find name of suppliers who charge for some parts less than the average price of that part.

Q6. (12 points, 6 points each) Consider the following relational schema:
STUDENT(SID, SNAME, DEPT)
ENROLL(CID, SID, GRADE, SEMESTER)
COURSE(CID, DEPT)

Write the following SQL queries in Relational Algebra:

A.

```
SELECT S.SNAME
FROM STUDENT S, ENROLL E
WHERE S.SID=E.SID AND E.CID='CSE565'
```

B.

```
 SELECT *
FROM STUDENT S
WHERE NOT EXISTS (SELECT *
                  FROM ENROLL E
                  WHERE E.SID = S.SID AND E.GRADE = 4.0)
```