

BIRLA INSTITUTE OF TECHNOLOGY & SCIENCE, PILANI

DATABASE SYSTEMS II SEMESTER 2014-2015

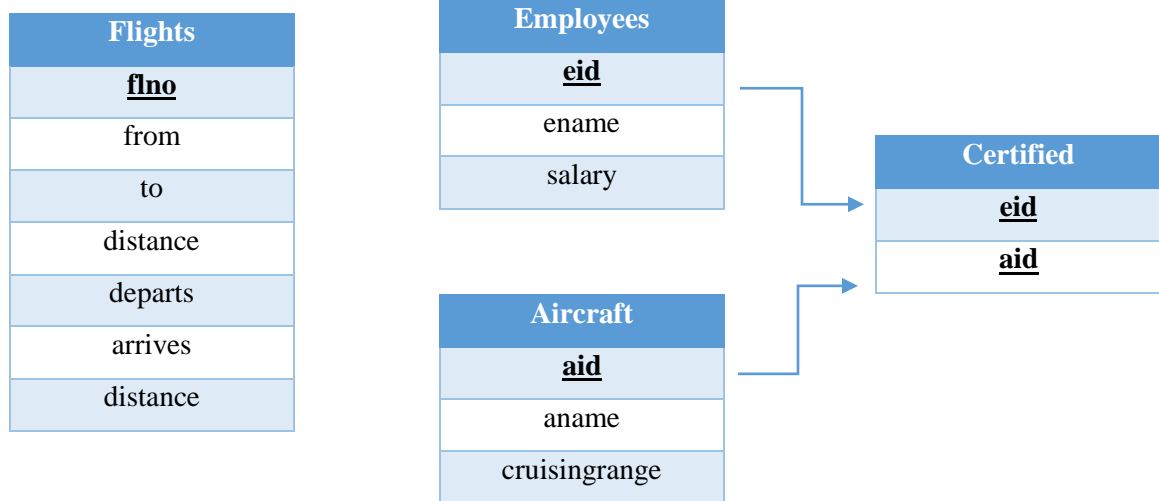
Date: 4th March 2014 Duration: 120 minutes Weightage: % Max Marks: 30

SET: A

Each Query is of two marks.

Marking Scheme is specified in front of each question

I. Consider the following relations, which keep track of airline flight information



Note that the Employees relation describes pilots and other kinds of employees as well; every pilot is certified for some aircraft, and only pilots are certified to fly.

1. For each pilot who is certified for more than three aircraft, find the eid and the maximum cruisingrange of the aircraft for which she or he is certified.

(0/2)

SELECT eid, MAX(cruisingrange) FROM Certified NATURAL JOIN Aircraft GROUP BY eid HAVING COUNT(*) > 3;	3	EID	CRUSINGRANGE
		-----	-----
		269734834	8430
		142519864	8430
		567354612	8430

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2. Find the names of pilots whose salary is less than the price of the cheapest route from Los Angeles to Honolulu

(0/2)

SELECT ename FROM Employees WHERE salary < (SELECT MIN(price) FROM Flights WHERE origin = 'Los Angeles' and destination = 'Honolulu');	1	ENAME ----- Milo Brooks
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3. For all the aircraft with cruisingrange over 1000 miles, find the names of the aircraft and average salary of all pilots certified for this aircraft.

Observe that aid is the key for Aircraft, but the question asks for aircraft names; we deal with this complication by using an intermediate relation Temp:

(0/2)

SELECT aname, avg(e.salary) FROM Aircraft A INNER JOIN Certified C USING (aid), Employees e WHERE A.cruisingrange >1000 and (e.aid = c.aid) GROUP BY aname;	14	ANAME AVG(SALARY) ----- ----- Boeing 737-800 191700.25 Tupolev 154 205001.25 Embraer ERJ-145 182838.2 Airbus A340-300 217597.6667 SAAB 340 118113.5
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4. Find the names of pilots certified for some Boeing Aircraft.

(0/2)

SELECT DISTINCT ename FROM Certified NATURAL JOIN Employees NATURAL JOIN Aircraft WHERE aname LIKE 'Boeing%';	10	ENAME ----- Lisa Walker Larry West Michael Miller
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	Mark Young James Smith
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5. Identify the routes that can be piloted by every pilot who makes more than \$1, 00,000
(0/1/2)

SELECT DISTINCT(f.origin ' to ' f.destination) FROM Flights F, Aircraft A INNER JOIN Certified C USING(aid) WHERE(F.distance <= A.cruisingrange) and 100000>ALL(SELECT Q.salary FROM Employees Q WHERE Q.eid=C.eid) ;	16	Madison to Minneapolis Los Angeles to Dallas Chicago to Los Angeles Los Angeles to Tokyo Chicago to New York
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6. A customer wants to travel from Madison to New York with no more than two changes of flight. List the choice of departure times from Madison if the customer wants to arrive in New York by 6 p.m.

(0/1/2)

SELECT F.departs FROM Flights F WHERE F.fno IN ((SELECT F0.fno FROM Flights F0 WHERE F0.origin = 'Madison' AND F0.destination = 'New York' AND extract(hour from F0.arrives) < '18') UNION (SELECT F0.fno FROM Flights F0, Flights F1 WHERE F0.origin = 'Madison' AND F0.destination <> 'New York' AND F0.destination = F1.origin AND F1.destination = 'New York' AND F1.departs > F0.arrives AND extract(hour from F1.arrives) < '18') UNION (SELECT F0.fno FROM Flights F0, Flights F1, Flights F2 WHERE F0.origin = 'Madison' AND F0.destination = F1.origin	3	DEPARTS ----- 12-APR-05 07.05.00.000000000 AM 12-APR-05 08.32.00.000000000 AM 12-APR-05 06.15.00.000000000 AM
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AND F1.destination = F2.origin AND F2.destination = 'New York' AND F0.destination <> 'New York' AND F1.destination <> 'New York' AND F1.departs > F0.arrives AND F2.departs > F1.arrives AND extract(hour from F2.arrives) < '18'));		
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7. Compute the difference between the average salary of a pilot and the average salary of all employees (including pilots).

(0/1/2)

SELECT Temp1.avg - Temp2.avg FROM (SELECT AVG (E.salary) AS avg FROM Employees E WHERE E.eid IN (SELECT DISTINCT C.eid FROM Certified C)) Temp1, (SELECT AVG (E1.salary) AS avg FROM Employees E1) Temp2;	1	TEMP1.AVG-TEMP2.AVG ----- 11449.64516
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8. Print the names of employees who are certified only on aircrafts with cruising range longer than 1000 miles, but on at least two such aircrafts.

(0/1/2)

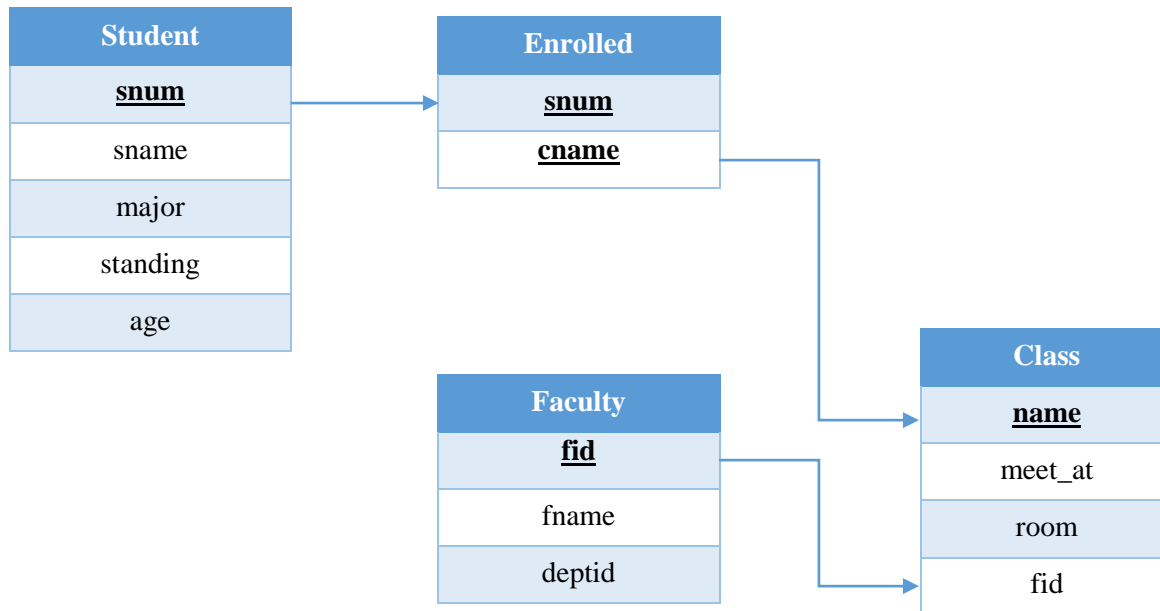
SELECT E.ename FROM Employees E, Certified C, Aircraft A WHERE C.aid = A.aid AND E.eid = C.eid AND A.cruisingrange>1000 GROUP BY E.eid, E.ename HAVING COUNT (*) > 1;	15	ENAME ----- George Wright Mary Johnson Larry West Joseph Thompson James Smith
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- II. Consider the following relations. The meaning of relations is straightforward; for example enrolled has one record per student-class pair such that student is enrolled in the class.



1. Find the age of the oldest student who is either a History major or enrolled in a course taught by Ivana Teach.

(0/1/2)

<pre>SELECT MAX (S.age) FROM Student S WHERE (S.major = 'History') OR S.snum IN (SELECT E.snum FROM Class C, Enrolled E, Faculty F WHERE E.cname = C.name AND C.fid = F.fid AND F.fname = 'Ivana Teach');</pre>	1	<pre>MAX(S.AGE) ----- 20</pre>
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2. Find the names of faculty members who teach in every room in which some class is taught.

(0/1/2)

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<pre>SELECT DISTINCT F.fname FROM Faculty F WHERE NOT EXISTS ((SELECT C.room FROM Class C) MINUS (SELECT C1.room FROM Class C1 WHERE C1.fid = F.fid));</pre>	1	<div>FNAME</div> <div>-----</div> <div>Richard Jackson</div>
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3. Find the names of faculty members for whom the combined enrollment of the courses that they teach is less than five.

(0/1/2)

<pre>SELECT DISTINCT F.fname FROM Faculty F WHERE 5 > (SELECT COUNT (E.snum) FROM Class C, Enrolled E WHERE C.name = E.cname AND C.fid = F.fid);</pre>	13	<div>FNAME</div> <div>-----</div> <div>Robert Brown</div> <div>David Anderson</div> <div>Richard Jackson</div> <div>Patricia Jones</div> <div>Michael Miller</div>
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4. For each standing, print the standing and the average age of students for that standing.

(0/2)

<pre>SELECT S.standing, AVG (S.age) FROM Student S GROUP BY S.standing;</pre>	4	<div>STANDING AVG(S.AGE)</div> <div>-----</div> <div>SR 20.71428571</div> <div>SO 18.4</div> <div>FR 17.66666667</div> <div>JR 19.5</div>
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5. Find the names of all Juniors (standing = JR) who are enrolled in a class taught by Ivana Teach.

(0/2)

<pre>SELECT DISTINCT S.Sname FROM Student S, Class C, Enrolled E, Faculty F WHERE S.snum = E.snum AND E.cname = C.name AND C.fid = F.fid AND F.fname = 'Ivana Teach' AND S.standing = 'JR';</pre>	2	<div>SNAME</div> <div>-----</div> <div>Christopher Garcia</div> <div>Paul Hall</div>
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6. For each faculty member that has taught classes only in room R128, print the faculty member's name and the total number of classes she or he has taught.

(0/1/2)

<pre>SELECT F.fname, COUNT (*) AS CourseCount FROM Faculty F, Class C WHERE F.fid = C.fid GROUP BY F.fid, F.fname, C.room HAVING 'R128'=ALL (C.room);</pre>	5	FNAME	COURSECOUNT

		Richard Jackson	1
		Robert Brown	1
		Linda Davis	1
		Barbara Wilson	1
		Elizabeth Taylor	1

7. Find the names of students not enrolled in any class.

(0/2)

<pre>SELECT DISTINCT S.sname FROM Student S WHERE S.snum NOT IN (SELECT E.snum FROM Enrolled E);</pre>	13	SNAME

		Dorthy Lewis
		Daniel Lee
		Angela Martinez
		Maria White
		Thomas Robinson