

Worksheet1 CIS 3530 (Understanding relational model)

1. You are given a relation R:



Col1	Col2	Col3
1	10	a
1	20	b
2	5	c
3	6	d
4	23	e
5	8	f

Match the following in context of R. You may use arrows going from the list on the left to the entries on the right. An entry on the left may match to more than one on the right:

LEFT	RIGHT
Schema	3
Cardinality	Number of tuples
Degree	{col1, col2, col3}
(Possible) domain of Col3	6
Instance of R	7
	All columns and rows at a given time t
	Lowercase alphabets
	Alphabets
	Alphanumeric

2. List all super keys for this schema: R (A,B,C)
3. A. Identify the foreign keys in the relational database schema given below by joining an arrow from the FK in referring relation to the referencing relation. Primary key for each relation is underlined:

course (courseCode, courseName, courseCredit, courseType, dno)

lab (labId, courseCode, qtrCode, profId, time, length, days, room)

prof (profId, fname, lname, position, dno, salary)

assignment (assntId, studentId, countGraded)

labasst (studentId, fname, lname, maxHrsAllowed, labId)

dept (dno, dname, profId)

B. State True or False in context with the schema given in 3A.

- a. No two departments can have courses with the same courseCode .
- b. A course must have a lab.
- c. A course can have multiple lab sections.
- d. A TA can be a lab assistant of one or more labs.
- e. A department can have several professors in it.
- f. An assignment is graded by one or more Tas.

4. Identify any entity integrity or referential integrity **violation** in the instance given below for the following operations. Primary key attribute in each relation is underlined.

- a. Insert the following tuple into dept: <60, Math>
- b. Insert the following tuple into course: <3530, Intro to Machine Learning, 3, core, 64>
- c. Delete tuple with courseCode = 2500 and dno = 60 from course.
- d. Delete tuple with courseCode = 2500 and dno = 61 from course.
- e. Modify courseType of courseCode = 2500, dno = 60 in course to core.
- f. Modify dno of course 1400 in labs to 64.

course

<u>courseCode</u>	courseName	courseCredit	courseType	<u>dno</u>
1050	Legacy Systems	2	core	60
1300	Programming in C	2	core	60
2500	Advanced concepts in C	2	core	60
3210	Large-scale Programming	2	elective	60
3530	Database Management System	3	core	60
4150	Oracle Database development	3	elective	60
1400	Physics I	2	core	61
2500	Mechanics	3	elective	61
4540	Analysis of algorithms	3	core	60
3100	Quantum Physics and Chemistry	4	elective	61
3110	Operating System	2	core	60

dept

<u>dno</u>	dname
60	CIS
61	Physics

labs

<u>labId</u>	courseCode	dno	qtrCode	profId	time	length	days	room
1	1050	60	2010F	AR	11:30	2	MW	Rey0001
2	1050	60	2011W	AR	11:30	2	TR	Rey0002
3	1300	60	2010F	RH	10:00	2	MW	ROZ0001
4	2500	60	2011W	DW	14:30	2	TR	TH1200
5	3210	60	2010W	DW	14:30	3	F	G125
6	4150	60	2010W	DW	10:00	2	TR	G125
7	3530	60	2011W	RH	11:30	3	F	MCKN50
8	1400	61	2010F	NS	10:00	3	F	TH1110