

Assignment Broject Exam Help

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Integrity Constraints over Relations

Assignment Project Exam Help Constraints are conditions that must hold on all relations in a database

- Constraints are conditions that must hold on all relations in a database state.
- The transfer of contracts of the color of
 - Domain constraints;
 - WeChat: cstutorcs
 - Entity integrity constraints;
 - Referential integrity constraints.



(1) Domain Constraints

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- Every value in a tupleymust be from the domain of its attribute. Lutores.com

 - VARCHAR
 - DATE
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(2) Key Constraints - Observation

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No two students have the same student ID:

1.44	STUDENT					
ntrns	Studer til	Na ne	COB			
	456	Tom	25/01/1988	tom@gmail.com		
-	458	Peter	23/05/1993	peter@gmail.com		
	459	Fran	11/09/1987	frankk@gmail.com		

No we can men share the same student to the same course number in the same semester.

Enrol					
StudentID	StudentID CourseNo Semester Status EnrolDate				
456	COMP2400	2016 S2	active	25/05/2016	
458	COMP1130	2016 S1	active	20/02/2016	
459	COMP2400	2016 S2	active	11/06/2016	



(2) Key Constraints - Definitions

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- A superkey SK of R is a subset of attributes of R, i.e., $SK \subseteq \{A_1, \ldots, A_n\}$, such that the sum of the sum of the same value for SK.
- A superkey SK of R is **minimal** if there is no other superkey $SK' \subset SK$ held on R. A minimal superkey is also known as a condidate key.
- A primary key PK of R is a minimal superkey of R, (i.e., a primary key is one of the candidate keys). If a relation has only one candidate key then that would be the primary key.



(2) Key Constraints - Example

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_	Studentib	ivanie	סס	
	456	Tom	25/01/1988	tom@gmail.com
_	458	Peter	23/05/1993	peter@gmail.com
ht	459 • /	/Fran 4	- 11/09/1987	frankk@gmail.com
	460 . /	Tyrol	12/(19/1987)	yrion@hdtnlail.com

- Is {DoB} a superkey of STUDENT? No!
- Is { Mude till DoB as Iperkey of Stup (1) Yes S
- Is {StudentID, DoB} a candidate key of STUDENT? No!
- Is {StudentID} a candidate key of STUDENT? Yes!
- Can {StudentID} be chosen as a primary key of STUDENT? Yes!
- Can {DoB} be chosen as a primary key of STUDENT? No!



(2) Key Constraints - Example

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	ENROL					
	StudentID	CourseNo	Semester	Status	EnrolDate	
4	456	COMP2400	2016 S2	active	25/05/2016	
r	1 1 1 4 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	CØMP1139	2016 St	agtive	20/02/2016	
1.	5g D	/OOMF2409	2016/S2 •	áctive	1/06/2016	
	458	COMP1130	2015 S1	inactive	20/02/2015	

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- Is {CourseNo, Semester} a superkey of ENROL? No!
- Is {StudentID, CourseNo, Semester} a candidate key of ENROL? Yes!
- Can {StudentID, CourseNo} be chosen as a primary key of ENROL? No!



(3) Entity Integrity Constraints

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- null is a special value, which represents the value of an attribute that may be inknown or inadplicable torcs.com
- The entity integrity constraint states that no primary key value can be NULL.
 - tuples in a relation.
- Note: Other attributes of R may be constrained to disallow null values, even though they are not attributes in the primary key.



(3) Entity Integrity Constraints – Example

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If STUDENTID is specified as the primary key of STUDENT, then the following relation violates the entity integrity constraint.

https://tutoffcoent.comemail					
	456	Tom	25/01/1988	tom@gmail.com	
	NULL	Peter	23/05/1993	peter@gmail.com	
***	459	Fran	11/09/1987	frankk@gmail.com	
We	Cha	t: c	Stute	orcs	

• How about the case when EMAIL is the primary key of STUDENT?

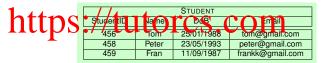
Answer: The relation does not violate the entity integrity constraint.



(4) Referential Integrity Constraints - Observation

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Every course number appearing in ENROL must exist in COURSE:



Wel	hat	GOURSE Chain	Unit
*****	COMP1130 COMP2400	Introduction to Advanced Computing I Relational Databases	6

Enrol					
StudentID CourseNo Semester Status EnrolDate					
456	COMP2400	2016 S2	active	25/05/2016	
458	COMP1130	2016 S1	active	20/02/2016	
459	COMP2400	2016 S2	active	11/06/2016	



(4) Referential Integrity Constraints - Definition

ASSWegsen[Anto dampet the value of attribute of in tuplezt. an Help Example: For the tuple t=(459,Fran. 11/09/1987,frankk@gmail.com), t[Name]=Fran and t[DoB]=11/09/1987.

- A referential integrity constraint specifies a reference between two relations while the previous constraints involve only one relation.
- Let R_1 and R_2 be relation schemas in a database schema S, and R_2 has the primary key $\{B_1, \ldots, B_n\}$.
- A foreign key on R_1 is a statement $[A_1,\ldots,A_n]\subseteq R_2[B_1,\ldots,B_n]$ restricting states of $\{A_1,\ldots,A_n\}$ and $\{A_1,\ldots,A_n\}$ restricting states of $\{A_1,\ldots,A_n\}$ and $\{A_1,\ldots,A_n\}$ restricting states of $\{A_1,\ldots,A$
 - for each tuple $t \in r(R_1)$ there exists a tuple $t' \in r(R_2)$ with $t[A_i] = t'[B_i]$ for i = 1, ..., n.
- R₁ is called the referencing relation and R₂ is called the referenced relation.



(4) Referential Integrity Constraints – Example

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		STUDENT				
	StudentID	Name	DoB	Email		
	456	Tom	25/01/1988	tom@gmail.com		
1-44-	458	Peter	23/05/1993	peter@gmail.com		
	459	Fra	11/09/1987	fank @ n ail co n		

	Course			
	<u>No</u>	Cname Unit		
We	CON P1130 CON P2 400	/ Introduction to Advanced Computing I Relational Databates	6	

ENROL					
<u>StudentID</u>	<u>CourseNo</u>	<u>Semester</u>	Status	EnrolDate	
456	COMP2400	2016 S2	active	25/05/2016	
458	COMP1130	2016 S1	active	20/02/2016	
459	COMP2400	2016 S2	active	11/06/2016	



(4) Referential Integrity Constraints – Example

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OurseNo] Course[No];

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This database state satisfies the above two foreign keys because

Why each tup e_1t in ENROL, Get e_1 is a up of the Course such that the Course No value in t_1 is the same with the No value in t_2 ;

• for each tuple $t_1^{'}$ in ENROL, there is a tuple $t_2^{'}$ in STUDENT such that the StudentID value in $t_1^{'}$ is the same with the StudentID value in $t_2^{'}$.



(4) Referential Integrity Constraints – Question

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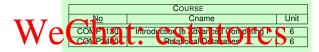
ENROL					
<u>StudentID</u>	<u>CourseNo</u>	<u>Semester</u>	Status	EnrolDate	
456	COMP2400	2016 S2	active	25/05/2016	
458	COMP1130	2016 S1	active	20/02/2016	
459	COMP2600	2016 S2	active	11/06/2016	



(4) Referential Integrity Constraints – Question

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ENROL					
StudentID CourseNo Semester Status Enr					
456	COMP2400	2016 S2	active	25/05/2016	
458	COMP1130	2016 S1	active	20/02/2016	
459	COMP2600	2016 S2	active	11/06/2016	



Constraint Violations

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- Insert: insert one or more new tuples in a relation;
- Delete: delete tuples in a relation;

htptip Sr. World the Slues of this es in existing tuples.

- Whenever these operations are applied, the integrity constraints specified in a database schema should not be violated.
- HOW, eChat: cstutorcs
 - Insert may violate ...
 - Delete may violate ...
 - Update may violate ...