

4 types of constraints are:

1. Domain constraint
2. Key constraint
3. Entity Integrity constraint
4. Referential Integrity Constraint

Consider the examples below and state which constraints were violated and why? [All primary keys(pk) are underlined and foreign keys(fk) are shown with arrows from fk to pk]

Example 1

<u>Student ID</u>	Name	Age
001	Zainab	19
002	Hazzaz	A
003	Faiza	20
004	Amanat	18

Answer: Domain constraint, because age should have integers, second row has a character.

Example 2

<u>Student ID</u>	Name	Age
001	Azibun	19
002	1.5	20
null	Partho	20
004	Jabed	18

Answer: Domain and Entity Integrity. Name has a double value so domain constraint violated and student_id is primary key but a null value exists so entity integrity constraint has been violated.

Example 3

<u>Student ID</u>	Name	Age
001	Wasema	19
002	Junaid	20
001	Afia	20
004	Hasibul	18

Answer: Key constraint as duplicate student_id exists even though student_id is primary key.

Example 4

<u>Student ID</u>	<u>Course Code</u>	Grade
001	CSE370	3.7
002	CSE221	4.0
003	CSE110	null
004	CSE220	3.0

Answer: no constraint has been violated.

Example 5

(foreign key)

<u>Student ID</u>	<u>Course Code</u>	Grade
001	CSE370	3.7
002	CSE221	4.0
003	null	3.3
004	CSE220	3.0

<u>Course Code</u>	<u>Course Title</u>
CSE370	Database
CSE221	Algorithm
CSE220	Data Structure

Answer: Entity Integrity violated. course_code is part of the primary key, therefore it cannot be null.

Example 6

Student_Grades

(foreign key)

<u>Student ID</u>	<u>Course Code</u>	Grade
001	CSE370	3.7
002	CSE221	4.0
001	CSE110	null
004	CSE220	3.0

Course

<u>Course Code</u>	<u>Course Title</u>
CSE370	Database
CSE221	Algorithm
CSE220	Data Structure

Answer: Referential Integrity violated. Course_code in "Student_Grades" is a foreign key, the value CSE110 does not exist in the referenced table "Course"

Example 7

1. Update the course_code of Database course from CSE370 to CSE390 in the **Course** table in Example 6.
2. Insert a row with the following values (1.5, 'Discrete') in the **Course** table in Example 6.
3. Delete the row from **Student_Grades** table in Example 6 where course_code='CSE110'.

Answer:

1. Referential Integrity, cse370 is referenced in the foreign key column in student_grades table

2. Domain constraint because course_code should be char/varchar/text, not decimal/double

3. no violation.