COURSE: CS-4513 – DATABASE MANAGEMENT SECTION: 001
SEMESTER: FALL 2024
INSTRUCTOR: DR. LE GRUENWALD
GROUP NUMBER: 54
GROUP MEMBERS: Kenny Bartel, Alicia Maranville, Preston Roesslet, Emma Smith
SCORE:

GQ1) (8 points) To verify whether Azure SQL can check for integrity constraint violations, using the relational database that you have created for Problem 2 in Graded Homework 2, write SQL statements that implement the following queries, run them on Azure SQL, and capture the error messages generated by Azure SQL:

a) One insertion query that violates the uniqueness of the primary key of a table.

b) One insertion query that violates the not-null value of the primary key of a table.

c) One insertion query, one deletion query, and one update query that violate the foreign key constraint of a table.

d) One retrieval query that violates the domain constraint of an attribute of a table.

```sql
-- Homework 3 GQ 1

-- a) Insertion violation uniqueness of primary key
INSERT INTO Student VALUES (1, 'Adams', 'History', 'FR', 18)

-- b) Insertion violation not-null value of primary key
INSERT INTO Student VALUES (null, 'Adams', 'History', 'FR', 18)

-- c) Insertion, deletion, and update query violating foreign key constraint
INSERT INTO Class VALUES ('New Class', 'W 13:30', 'R128', 105)
DELETE FROM Faculty WHERE fid = 104
UPDATE Class SET fid = 105

-- d) Retrieval query violates domain constraint
SELECT snum FROM Student WHERE sname = 16
```

9:31:36 AM   Started executing query at Line 1
Msg 2627, Level 14, State 1, Line 4
Violation of PRIMARY KEY constraint 'PK__Student__335829789A342535'. Cannot insert duplicate key in object 'dbo.Student'. The dupli
cate key value is (1).
The statement has been terminated.
Msg 515, Level 16, State 2, Line 7
Cannot insert the value NULL into column 'snum', table 'cs-dsa-4513-sql-db.dbo.Student'; column does not allow nulls. INSERT fails.
The statement has been terminated.
Msg 547, Level 16, State 0, Line 10
The INSERT statement conflicted with the FOREIGN KEY constraint "fid_constraint". The conflict occurred in database "cs-dsa-4513-sql-
db", table "dbo.Faculty", column 'fid'.
The statement has been terminated.
Msg 547, Level 16, State 0, Line 11
The DELETE statement conflicted with the REFERENCE constraint "fid_constraint". The conflict occurred in database "cs-dsa-4513-sql-d
b", table "dbo.Class", column 'fid'.
The statement has been terminated.
Msg 547, Level 16, State 0, Line 12
The UPDATE statement conflicted with the FOREIGN KEY constraint "fid_constraint". The conflict occurred in database "cs-dsa-4513-sql
-db", table "dbo.Faculty", column 'fid'.
The statement has been terminated.
Msg 245, Level 16, State 1, Line 15
Conversion failed when converting the varchar value 'Adams' to data type int.
Total execution time: 00:00:00.043

GQ2) (8 points) Review the SQL file you have created for Problem 2 in Graded Homework 2, choose one table that should be indexed (assuming all queries are equally frequent), write SQL statement(s) to create an index on that table, and rerun the queries that need to access the table and index. Provide your detailed explanations as to why you chose that table and that search key for indexing, whether that index is primary or secondary, and why you chose those queries to rerun

dbo.Enrolled
> Columns
> Keys
> Constraints
> Triggers
∨ Indexes
　　idx_enrolled_snum_cname (Non-Uniqu... ↻

	sname ∨
1	Daniels
2	Daniels

	sname ∨
1	Codd

	oldest_age ∨
1	24

	fname ∨
1	Lynn
2	Lynn
3	Black

	cname ∨
1	Advanced Java
2	Computer Architecture
3	Intro to Compilers
4	Intro to Java
5	Software engineering

	snum ∨	sname ∨	major ∨	slevel ∨	age ∨
1	1	Adams	History	FR	18
2	2	Bethany	History	FR	20
3	3	Adams	CS	SF	20
4	4	Codd	CS	SF	22
5	5	Daniels	ECE	JR	22
6	6	Daniels	CS	JR	24