# IST769 Transactions and Temporal Tables

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Date Due:   
Homework #: 3

1. 1. In the demo database, create two tables:
   1. The first table **players** should have columns player id (int pk), player name (varchar), shots attempted (int) shots made (int)
   2. The second table **shots** should have columns shot id (int pk), player id (int fk to players), clock time (datetime) shot made (bit)
   3. Add two players to the players table. Mary and Sue initialize the players with 0 shots attempted and made.

GO

IF OBJECT\_ID('dbo.shots') IS NOT NULL

DROP TABLE dbo.shots;

GO

IF OBJECT\_ID('dbo.players') IS NOT NULL

BEGIN

ALTER TABLE dbo.players SET (SYSTEM\_VERSIONING = OFF);

DROP TABLE dbo.players

END

GO

IF OBJECT\_ID('dbo.write\_shot') IS NOT NULL

DROP PROCEDURE dbo.write\_shot;

GO

CREATE TABLE dbo.players(

player\_id INT NOT NULL IDENTITY,

player\_name VARCHAR(80) NOT NULL,

shots\_attemted INT,

shots\_made INT,

CONSTRAINT players\_PK PRIMARY KEY (player\_id)

);

CREATE TABLE dbo.shots(

shot\_id INT NOT NULL IDENTITY PRIMARY KEY,

player\_id INT NOT NULL FOREIGN KEY REFERENCES dbo.players(player\_id),

clock\_time DATETIME NOT NULL,

shot\_made BIT NOT NULL

);

GO

INSERT INTO players (player\_name, shots\_attemted, shots\_made)

VALUES ('Mary', 0, 0),('Sue',0,0)

GO

SELECT \* from dbo.players;

1. Write transaction safe code as a stored procedure which when given a player id, clock time, and whether the shot was made (bit value) will add the record to the **shots** table and update the player record in the **players** table. For example, If Mary takes a shot and makes it, then misses the next one, there would be two records in the **shots** table and her row in the **players** table should have 2 attempt and 1 shot made. Execute the stored procedure to demonstrate the transaction is ACID compliant.

GO

CREATE PROCEDURE dbo.write\_shot(

@player\_id INT,

@clock\_time datetime,

@shot\_made bit

)

AS

BEGIN TRANSACTION

INSERT dbo.shots (player\_id, clock\_time, shot\_made)

VALUES (@player\_id, @clock\_time,@shot\_made);

UPDATE dbo.players

SET shots\_attemted = COALESCE (shots\_attemted, 0) + 1,

shots\_made = CASE @shot\_made WHEN 1 THEN COALESCE (shots\_made, 0) + 1

ELSE shots\_made END

WHERE player\_id = @player\_id

COMMIT TRANSACTION

GO

1. Alter the **players** table to be a system-versioned temporal table.

GO

ALTER TABLE dbo.players

ADD StartTime DATETIME2 GENERATED ALWAYS AS ROW START HIDDEN DEFAULT GETUTCDATE(),

EndTime DATETIME2 GENERATED ALWAYS AS ROW END HIDDEN DEFAULT CONVERT(DATETIME2, '9999-12-31 23:59:59.9999999'),

PERIOD FOR SYSTEM\_TIME (StartTime, EndTime);

GO

​

ALTER TABLE dbo.players

SET (SYSTEM\_VERSIONING = ON (HISTORY\_TABLE=dbo.player\_history));

GO

1. Execute your stored procedure from part 2 to create at least 15 shot records over a 5-minute period. Make sure there are records in the first ½ of the 5-minute period and at few in the last minute of the 5-minute period.

GO

EXEC dbo.write\_shot 2, '2019/10/19 11:00:00',1;

EXEC dbo.write\_shot 1, '2019/10/19 11:10:00',0;

EXEC dbo.write\_shot 2, '2019/10/19 11:00:00',0;

EXEC dbo.write\_shot 1, '2019/10/19 11:10:00',0;

EXEC dbo.write\_shot 2, '2019/10/19 11:00:20', 1;

EXEC dbo.write\_shot 1, '2019/10/19 11:10:30',1;

EXEC dbo.write\_shot 2, '2019/10/19 11:00:40',0;

EXEC dbo.write\_shot 1, '2019/10/19 11:10:50',1;

EXEC dbo.write\_shot 2, '2019/10/19 11:20:00',1;

EXEC dbo.write\_shot 1, '2019/10/19 11:20:00',0;

EXEC dbo.write\_shot 2, '2019/10/19 11:20:00',0;

EXEC dbo.write\_shot 1, '2019/10/19 11:30:00',0;

EXEC dbo.write\_shot 2, '2019/10/19 11:30:20', 1;

EXEC dbo.write\_shot 1, '2019/10/19 11:35:30',1;

EXEC dbo.write\_shot 2, '2019/10/19 11:33:40',0;

EXEC dbo.write\_shot 1, '2019/10/19 11:36:50',1;

GO

SELECT \* FROM dbo.players

GO

1. Write SQL queries to show:
   1. The player statistics at the end of the 5-minute period (current statistics).
   2. The player statistics exactly 2 minutes and 30 seconds into the period.
   3. The player statistics in the last minute of the period.

SELECT \*

FROM dbo.players

FOR SYSTEM\_TIME BETWEEN '2019-10-19 11:00:00.0000000' AND '2019-10-19 11:05:00.0000000'

GO

SELECT \*

FROM dbo.players

FOR SYSTEM\_TIME BETWEEN '2019-10-19 11:00:00.0000000' AND '2019-10-19 11:00:30.0000000'

GO

SELECT \*

FROM dbo.players

FOR SYSTEM\_TIME BETWEEN '2019-10-19 11:05:00.0000000' AND '2019-10-19 11:05:00.0000000'

GO