

# IST769 Homework Submission

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Date Due: 07/27/2021

Date Due: Transactions and Temporal Tables

Homework #:3

## Exercise(s):

1. In the Demo database, create two tables:

- a. The first table **players** should have columns player id (int pk), player name (varchar), shots attempted (int) shots made (int)
- b. The second table **shots** should have columns shot id (int pk), player id (int fk to players), clock time (datetime) shot made (bit)
- c. Add two players to the players table. Mary and Sue initialize the players with 0 shots attempted and made.

## Solution:

```
*****  
Drop players and shots user tables if exist  
*****  
  
/****** Cleaning up History Table *****/  
---Turn Versioning Off  
ALTER TABLE dbo.players  
SET (SYSTEM_VERSIONING = OFF);  
GO  
  
  
IF EXISTS (SELECT * FROM INFORMATION_SCHEMA.TABLES WHERE TABLE_NAME='shots')  
BEGIN  
    DROP TABLE dbo.shots  
END  
GO  
  
IF EXISTS (SELECT * FROM INFORMATION_SCHEMA.TABLES WHERE TABLE_NAME='players')  
BEGIN  
    DROP TABLE dbo.players  
END  
GO  
  
IF EXISTS (SELECT * FROM INFORMATION_SCHEMA.TABLES WHERE TABLE_NAME='players_history')  
BEGIN  
    DROP TABLE dbo.players_history
```

```

        END
GO

IF EXISTS (SELECT * FROM INFORMATION_SCHEMA.TABLES WHERE TABLE_NAME='DB_Errors')
BEGIN
    DROP TABLE dbo.DB_Errors
END
GO

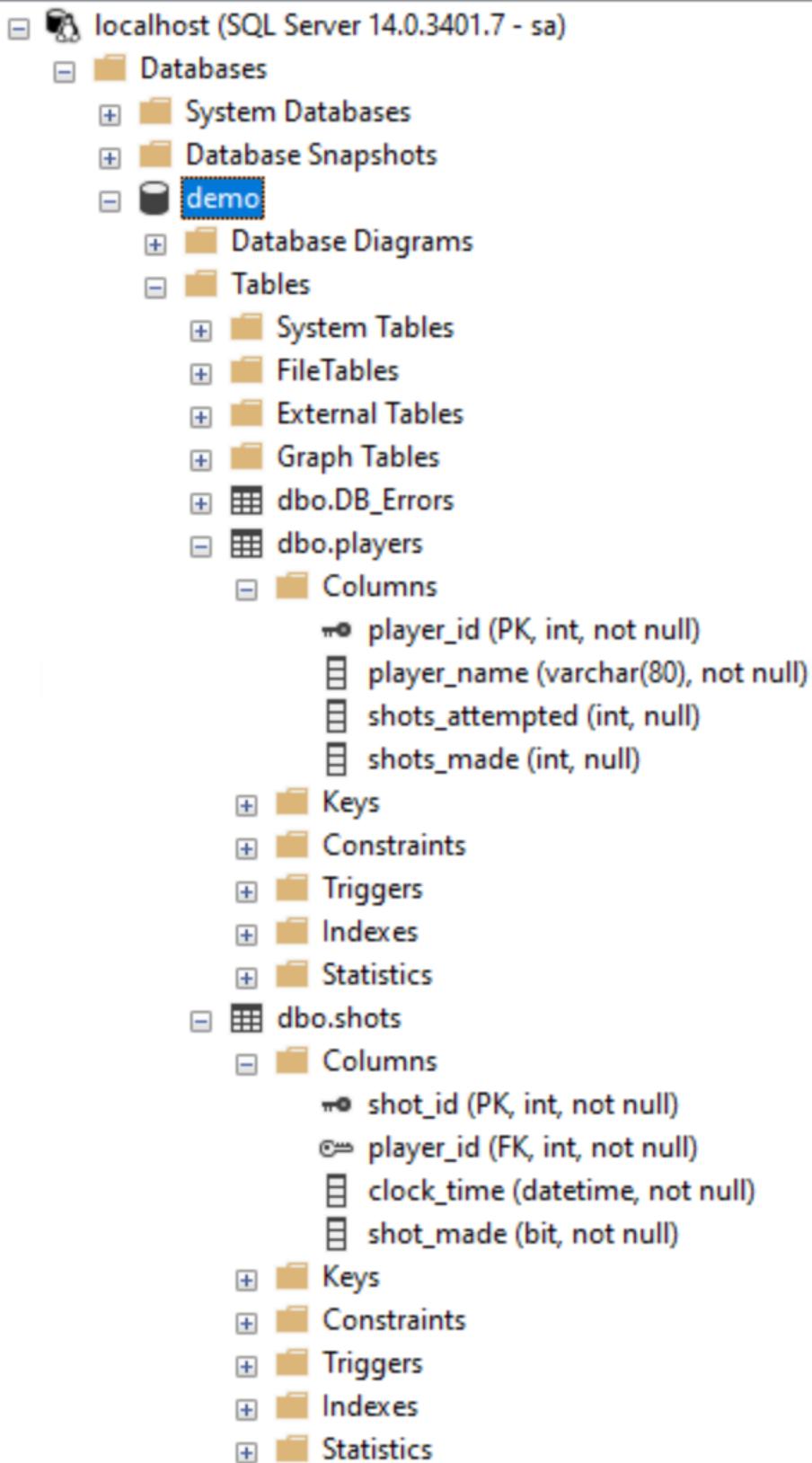
/***************** Table Creation *****/
----dbo.players table creation
CREATE TABLE dbo.players(
    player_id INT NOT NULL IDENTITY,
    player_name VARCHAR(80) NOT NULL,
    shots_attempted INT,
    shots_made INT,
    CONSTRAINT players_PK PRIMARY KEY (player_id)
)
GO
----dbo.shots table creation
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 default 'FALSE'
)
GO
---- Table to record errors
CREATE TABLE dbo.DB_Errors
(
    ErrorID      INT IDENTITY(1, 1),
    UserName     VARCHAR(100),
    ErrorNumber   INT,
    ErrorState    INT,
    ErrorSeverity INT,
    ErrorLine     INT,
    ErrorProcedure VARCHAR(MAX),
    ErrorMessage   VARCHAR(MAX),
    ErrorDateTime DATETIME
)
GO
/***************** Data Population *****/
INSERT INTO players (player_name, shots_attempted, shots_made)
VALUES ('Mary', 0, 0), ('Sue', 0, 0)
GO

SELECT * from dbo.players
GO
SELECT * from dbo.shots
GO

```

Evidence:

---



```

88  **** Data Population ****
89  INSERT INTO players (player_name, shots_attempted, shots_made)
90  VALUES ('Mary', 0, 0), ('Sue', 0, 0)
91  GO
92
93  SELECT * from dbo.players
94  GO
95  SELECT * from dbo.shots
96  GO
97

```

Results

player_id	player_name	shots_attempted	shots_made
1	Mary	0	0
2	Sue	0	0

```

SQLQuery4.sql - localhost.demo (sa (62))  SQLQuery3.sql - localhost.demo (sa (58))*
1  ***** Script for SelectTopNRows command from SSMS *****
2  SELECT TOP (1000) [player_id]
3      ,[player_name]
4      ,[shots_attempted]
5      ,[shots_made]
6  FROM [demo].[dbo].[players]

```

Results

player_id	player_name	shots_attempted	shots_made
1	Mary	0	0
2	Sue	0	0

2. 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.

**Solution:**

```

IF EXISTS (SELECT * FROM INFORMATION_SCHEMA.ROUTINES WHERE ROUTINE_NAME='p_write_shot')
BEGIN
    DROP PROCEDURE p_write_shot
END
GO

```

```

CREATE PROCEDURE dbo.p_write_shot(
    @player_id INT,
    @clock_time datetime,
    @shot_made bit
)
AS
BEGIN TRY
    BEGIN TRANSACTION

        INSERT INTO dbo.shots (player_id, clock_time, shot_made)
            SELECT @player_id, @clock_time, @shot_made
        ---- if @@ROWCOUNT <> 1
        ----THROW 50005, 'Failed to insert into shots table, zero rows affected',0;

        UPDATE dbo.players
            SET shots_attempted = COALESCE (shots_attempted, 0) + 1,
                shots_made = CASE @shot_made WHEN 1 THEN COALESCE (shots_made, 0) + 1
                                         ELSE shots_made END
        WHERE player_id = @player_id
        ---- if @@ROWCOUNT <> 1
        ----THROW 50006,'Failed to update into player table, zero rows affected',0;
        COMMIT TRANSACTION
    END TRY

    BEGIN CATCH
        INSERT INTO dbo.DB_Errors
        VALUES
            (SUSER_SNAME(),
            ERROR_NUMBER(),
            ERROR_STATE(),
            ERROR_SEVERITY(),
            ERROR_LINE(),
            ERROR_PROCEDURE(),
            ERROR_MESSAGE(),
            GETDATE());

        ---- Transaction uncommittable
        IF (XACT_STATE()) = -1
            ROLLBACK TRANSACTION

        ---- Transaction committable
        IF (XACT_STATE()) = 1
            COMMIT TRANSACTION
    END CATCH
GO

```

```

***** Validation *****
--select * from dbo.players
--select * from dbo.shots
EXEC dbo.p_write_shot @player_id=1, @clock_time='2021/07/26 16:00:00', @shot_made='TRUE'
GO
EXEC dbo.p_write_shot @player_id=1, @clock_time='2021/07/26 16:05:00', @shot_made='TRUE'
GO
EXEC dbo.p_write_shot @player_id=2, @clock_time='2021/07/26 16:00:00', @shot_made='TRUE'
GO
EXEC dbo.p_write_shot @player_id=2, @clock_time='2021/07/26 16:05:00', @shot_made='FALSE'
GO
EXEC dbo.p_write_shot @player_id=1, @clock_time='2021/07/26 16:00:00', @shot_made='TRUE'
GO
EXEC dbo.p_write_shot @player_id=1, @clock_time='2021/07/26 16:05:00', @shot_made='TRUE'
GO
-----negative scenarios
EXEC dbo.p_write_shot @player_id=10, @clock_time='2021/07/26 16:00:00', @shot_made='TRUE' -- foreign key violation on player_id - failure
GO
EXEC dbo.p_write_shot @player_id=1, @clock_time='2021/07/26 16:00:00', @shot_made=NULL --NOT NULL exception -failure
GO

select * from dbo.shots
select * from dbo.players
select * from dbo.DB_Errors

```

### Evidence:

Results		Messages							
shot_id	player_id	clock_time	shot_made						
1	1	2021-07-26 16:00:00.000	1						
2	1	2021-07-26 16:05:00.000	1						
3	2	2021-07-26 16:00:00.000	1						
4	2	2021-07-26 16:05:00.000	0						
5	1	2021-07-26 16:00:00.000	1						
6	1	2021-07-26 16:05:00.000	1						
player_id		player_name	shots_attempted						
1	1	Mary	4						
2	2	Sue	1						
ErrorID	UserName	ErrorNumber	ErrorState	ErrorSeverity	ErrorLine	ErrorProcedure	ErrorMessage	ErrorDateTime	
1	1	sa	547	0	16	11	dbo.p_write_shot	The INSERT statement conflicted with the FOREIGN...	2021-07-27 01:02:19.020
2	2	sa	515	2	16	11	dbo.p_write_shot	Cannot insert the value NULL into column 'shot_mad...	2021-07-27 01:02:19.040

Query executed successfully.

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

**Solution:**

```
----alter dbo.players table to add hidden columns that are used as version columns
ALTER TABLE dbo.players
----Add the system versioning history table
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 23:59:59.999999'),
    PERIOD FOR SYSTEM_TIME (StartTime, EndTime);
GO
----Turn on the System_Versioning to player table on players_history table
ALTER TABLE dbo.players
SET (SYSTEM_VERSIONING = ON (HISTORY_TABLE=dbo.players_history));
GO
```

**Evidence:**

The screenshot shows two tables in the Results tab of SQL Server Management Studio. The top table is 'players' and the bottom table is 'players\_history'. Both tables have the same schema: player\_id, player\_name, shots\_attempted, shots\_made, StartTime, and EndTime.

	player_id	player_name	shots_attempted	shots_made	StartTime	EndTime
1	1	Mary	4	4		
2	2	Sue	2	1		

srajendi\_HW3.sql - localhost.demo (sa (55))\* - Microsoft SQL Server Management Studio

File Edit View Project Tools Window Help

New Query MDX DMX XML DA

demo Execute

Object Explorer

Connect

- localhost (SQL Server 14.0.3401.7 - sa)
  - Databases
    - System Databases
    - Database Snapshots
  - demo
    - Database Diagrams
    - Tables
      - System Tables
      - FileTables
      - External Tables
      - Graph Tables
      - dbo.DB\_Errors
      - dbo.players (System-Versioned)
        - dbo.players\_history (History)
          - Columns
            - player\_id (int, not null)
            - player\_name (varchar(80), not null)
            - shots\_attempted (int, null)
            - shots\_made (int, null)
            - StartTime (datetime2(7), not null)
            - EndTime (datetime2(7), not null)
          - Constraints
          - Indexes
          - Statistics
        - Columns
        - Keys
        - Constraints
        - Triggers
        - Indexes
        - Statistics
      - dbo.shots

- 4. 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.**

**Solution:**

```
/* Delete all records from shots and players table */
--Delete from dbo.shots
--Go
--Delete from dbo.players
--Go
SELECT * FROM dbo.players
SELECT * FROM dbo.shots
-----insert records-----
--INSERT INTO players (player_name, shots_attempted, shots_made)
--VALUES ('Mary', 0, 0),('Sue',0,0)
--GO
EXEC dbo.p_write_shot @player_id=1, @clock_time = '2021/07/26 18:55:00',@shot_made =1;
WAITFOR DELAY '00:00:05'
EXEC dbo.p_write_shot @player_id=2, @clock_time = '2021/07/26 18:55:10',@shot_made =1
WAITFOR DELAY '00:00:05'
EXEC dbo.p_write_shot @player_id=1, @clock_time = '2021/07/26 18:55:20',@shot_made =1;
WAITFOR DELAY '00:00:05'
EXEC dbo.p_write_shot @player_id=2, @clock_time = '2021/07/26 18:55:30',@shot_made =1
WAITFOR DELAY '00:00:05'
EXEC dbo.p_write_shot @player_id=1, @clock_time = '2021/07/26 18:55:40',@shot_made =1;
WAITFOR DELAY '00:00:05'
EXEC dbo.p_write_shot @player_id=2, @clock_time = '2021/07/26 18:55:50',@shot_made =1;
WAITFOR DELAY '00:00:05'
EXEC dbo.p_write_shot @player_id=1, @clock_time = '2021/07/26 18:56:00',@shot_made =1;
WAITFOR DELAY '00:00:05'
EXEC dbo.p_write_shot @player_id=2, @clock_time = '2021/07/26 18:56:10',@shot_made =1;
WAITFOR DELAY '00:00:05'
EXEC dbo.p_write_shot @player_id=1, @clock_time = '2021/07/26 18:56:20',@shot_made =0;
WAITFOR DELAY '00:00:05'
EXEC dbo.p_write_shot @player_id=2, @clock_time = '2021/07/26 18:56:30',@shot_made =1;
WAITFOR DELAY '00:00:05'
EXEC dbo.p_write_shot @player_id=1, @clock_time = '2021/07/26 18:56:40',@shot_made =1;
WAITFOR DELAY '00:00:05'
EXEC dbo.p_write_shot @player_id=2, @clock_time = '2021/07/26 18:56:50',@shot_made =0
WAITFOR DELAY '00:00:05'
EXEC dbo.p_write_shot @player_id=1, @clock_time = '2021/07/26 18:57:00',@shot_made =1;
WAITFOR DELAY '00:00:05'
EXEC dbo.p_write_shot @player_id=2, @clock_time = '2021/07/26 18:57:10',@shot_made =0;
WAITFOR DELAY '00:00:05'
```





```

EXEC dbo.p_write_shot @player_id=1, @clock_time = '2021/07/26 19:05:20',@shot_made =1;
WAITFOR DELAY '00:00:05'
EXEC dbo.p_write_shot @player_id=2, @clock_time = '2021/07/26 19:05:30',@shot_made =1;
WAITFOR DELAY '00:00:05'

SELECT * FROM dbo.players
select * from dbo.players_history

```

### Evidence:

```

222    --Delete from dbo.players
223    --Go
224    SELECT * FROM dbo.players
225    SELECT * FROM dbo.shots
226    --*****insert records*****
227    --INSERT INTO players (player_name, shots_attempted, shots_made)
228    --VALUES ('Mary', 0, 0),('Sue',0,0)
229    --GO
230    EXEC dbo.p_write_shot @player_id=1, @clock_time = '2021/07/26 18:55:00',@shot_made =1;
231    WAITFOR DELAY '00:00:05'
232    EXEC dbo.p_write_shot @player_id=2, @clock_time = '2021/07/26 18:55:10',@shot_made =1
233    WAITFOR DELAY '00:00:05'
234    EXEC dbo.p_write_shot @player_id=1, @clock_time = '2021/07/26 18:55:20',@shot_made =1;
235    WAITFOR DELAY '00:00:05'
236    EXEC dbo.p_write_shot @player_id=2, @clock_time = '2021/07/26 18:55:30',@shot_made =1
237    WAITFOR DELAY '00:00:05'
238    EXEC dbo.p_write_shot @player_id=1, @clock_time = '2021/07/26 18:55:40',@shot_made =1;
239    WAITFOR DELAY '00:00:05'
240    EXEC dbo.p_write_shot @player_id=2, @clock_time = '2021/07/26 18:55:50',@shot_made =1;

194 %
Query executed successfully.

```

```

SQLQuery3.sql - localhost.demo (sa (58))  IST659_WikiChannel...st.master (sa (51))  srajendi_HW2.sql - localhost.demo (sa (55))  X srajendi_HW2.sql - localhost.master (sa (56))
342    EXEC dbo.p_write_shot @player_id=1, @clock_time = '2021/07/26 19:04:20',@shot_made =1;
343    WAITFOR DELAY '00:00:05'
344    EXEC dbo.p_write_shot @player_id=2, @clock_time = '2021/07/26 19:04:30',@shot_made =1;
345    WAITFOR DELAY '00:00:05'
346    EXEC dbo.p_write_shot @player_id=1, @clock_time = '2021/07/26 19:04:40',@shot_made =1;
347    WAITFOR DELAY '00:00:05'
348    EXEC dbo.p_write_shot @player_id=2, @clock_time = '2021/07/26 19:04:50',@shot_made =1;
349    WAITFOR DELAY '00:00:05'
350    EXEC dbo.p_write_shot @player_id=1, @clock_time = '2021/07/26 19:05:00',@shot_made =1;
351    WAITFOR DELAY '00:00:05'
352    EXEC dbo.p_write_shot @player_id=2, @clock_time = '2021/07/26 19:05:10',@shot_made =1;
353    WAITFOR DELAY '00:00:05'
354    EXEC dbo.p_write_shot @player_id=1, @clock_time = '2021/07/26 19:05:20',@shot_made =1;
355    WAITFOR DELAY '00:00:05'
356    EXEC dbo.p_write_shot @player_id=2, @clock_time = '2021/07/26 19:05:30',@shot_made =1;
357    WAITFOR DELAY '00:00:05'

358
359    SELECT * FROM dbo.players
360    select * from dbo.players_history

```

Results    Messages

	player_id	player_name	shots_attempted	shots_made
1	1	Mary	4	4
2	2	Sue	2	1

	shot_id	player_id	clock_time	shot_made
1	1	1	2021-07-26 16:00:00.000	1
2	2	1	2021-07-26 16:05:00.000	1
3	3	2	2021-07-26 16:00:00.000	1
4	4	2	2021-07-26 16:05:00.000	0
5	5	1	2021-07-26 16:00:00.000	1
6	6	1	2021-07-26 16:05:00.000	1

 Executing query...

```
330      EXEC dbo.p_write_shot @player_id=1, @clock_time = '2021/07/26 19:03:20', @shot_made = 1;
331      WAITFOR DELAY '00:00:05'
332      EXEC dbo.p_write_shot @player_id=2, @clock_time = '2021/07/26 19:03:30', @shot_made = 0;
333      WAITFOR DELAY '00:00:05'
```

Results    Messages

	player_id	player_name	shots_attempted	shots_made
1	1	Mary	4	4
2	2	Sue	2	1

	shot_id	player_id	clock_time	shot_made
1	1	1	2021-07-26 16:00:00.000	1
2	2	1	2021-07-26 16:05:00.000	1
3	3	2	2021-07-26 16:00:00.000	1
4	4	2	2021-07-26 16:05:00.000	0
5	5	1	2021-07-26 16:00:00.000	1
6	6	1	2021-07-26 16:05:00.000	1

	player_id	player_name	shots_attempted	shots_made
1	1	Mary	36	30
2	2	Sue	34	25

	player_id	player_name	shots_attempted	shots_made	StartTime	EndTime
57	1	Mary	32	26	2021-07-27 01:13:20.8491071	2021-07-27 01:13:30.8698007
58	2	Sue	30	21	2021-07-27 01:13:25.8608669	2021-07-27 01:13:35.8780168
59	1	Mary	33	27	2021-07-27 01:13:30.8698007	2021-07-27 01:13:40.8898981
60	2	Sue	31	22	2021-07-27 01:13:35.8780168	2021-07-27 01:13:45.9028358
61	1	Mary	34	28	2021-07-27 01:13:40.8898981	2021-07-27 01:13:50.9097182
62	2	Sue	32	23	2021-07-27 01:13:45.9028358	2021-07-27 01:13:55.9180685
63	1	Mary	35	29	2021-07-27 01:13:50.9097182	2021-07-27 01:14:00.9322012
64	2	Sue	33	24	2021-07-27 01:13:55.9180685	2021-07-27 01:14:05.9431379

 Query executed successfully.

```
380  
381      select * from dbo.shots  
382  
383      ----select all records
```

194 %

	shot_id	player_id	clock_time	shot_made
53	55	1	2021-07-26 19:02:40.000	0
54	56	2	2021-07-26 19:02:50.000	0
55	57	1	2021-07-26 19:03:00.000	0
56	58	2	2021-07-26 19:03:10.000	1
57	59	1	2021-07-26 19:03:20.000	1
58	60	2	2021-07-26 19:03:30.000	0
59	61	1	2021-07-26 19:03:40.000	1
60	62	2	2021-07-26 19:03:50.000	1
61	63	1	2021-07-26 19:04:00.000	1
62	64	2	2021-07-26 19:04:10.000	1
63	65	1	2021-07-26 19:04:20.000	1
64	66	2	2021-07-26 19:04:30.000	1
65	67	1	2021-07-26 19:04:40.000	1
66	68	2	2021-07-26 19:04:50.000	1
67	69	1	2021-07-26 19:05:00.000	1
68	70	2	2021-07-26 19:05:10.000	1
69	71	1	2021-07-26 19:05:20.000	1
70	72	2	2021-07-26 19:05:30.000	1

Query executed successfully.

5. Write SQL queries to show:

- The player statistics at the end of the 5-minute period (current statistics).
- The player statistics exactly 2 minutes and 30 seconds into the period.
- The player statistics in the last minute of the period.

Solution:

```
--time range
```

```

select
    min(StartTime) min_StartTime
    ,min(EndTime) min_EndTime
    ,max(StartTime) max_StartTime
    ,max(EndTime) max_EndTime
    ,datediff(minute,min(StartTime),max(StartTime)) startTime_range_in_minutes
    ,datediff(minute,min(EndTime),max(EndTime)) endtime_range_in_minutes
    ,datediff(minute,min(StartTime),max(EndTime)) overall_range_in_minutes
from dbo.players_history
--where player_id in(5,6)

```

```

----select with as of time frame record
select * from dbo.players
for system_time AS OF '2021-07-27 01:14'

----select changes between time frames
select * from dbo.players
for system_time between '2021-07-27 01:04:00' and '2021-07-27 01:06:30'

----select changes in the last minute
select * from dbo.players
for system_time between '2021-07-27 01:14:00' and '2021-07-27 01:14:00'

```

**Evidence:**

The screenshot shows the SQL Server Management Studio interface with three main panes:

- Results Pane (Top):** Displays a table with the following data:

	min_StartTime	min_EndTime	max_StartTime	max_EndTime	startTime_range_in_minutes	endtime_range_in_minutes	overall_range_in_minutes
1	2021-07-27 01:03:24.1700000	2021-07-27 01:08:50.2823529	2021-07-27 01:13:55.9180685	2021-07-27 01:14:05.9431379	10	6	11

- Messages Pane (Middle):** Shows the following T-SQL code with line numbers 408 through 413:

```

407
408      ----select with as of time frame record
409      select * from dbo.players
410      for system_time AS OF '2021-07-27 01:14'
411
412      ----select changes between time frames
413      select * from dbo.players

```
- Results Pane (Bottom):** Displays a table with the following data:

	player_id	player_name	shots_attempted	shots_made
1	1	Mary	35	29
2	2	Sue	33	24

```
412      ----select changes between time frames
413      select * from dbo.players
414      for system_time between '2021-07-27 01:04:00' and '2021-07-27 01:06:30'
415
```

194 %

Results Messages

	player_id	player_name	shots_attempted	shots_made
1	1	Mary	4	4
2	2	Sue	2	1

```
415
416      ----select changes in the last minute
417      select * from dbo.players
418      for system_time between '2021-07-27 01:14:00' and '2021-07-27 01:14:00'
419
```

194 %

Results Messages

	player_id	player_name	shots_attempted	shots_made
1	1	Mary	35	29
2	2	Sue	33	24

```
22
23      **** Cleaning up Histroy Table ****
24      ---Turn Versioning Off
25      ALTER TABLE dbo.players
26      SET (SYSTEM_VERSIONING = OFF);
27      GO
28
```

194 %

Messages

```
Commands completed successfully.
```

Completion time: 2021-07-26T22:04:52.2138750-04:00

## Appendix

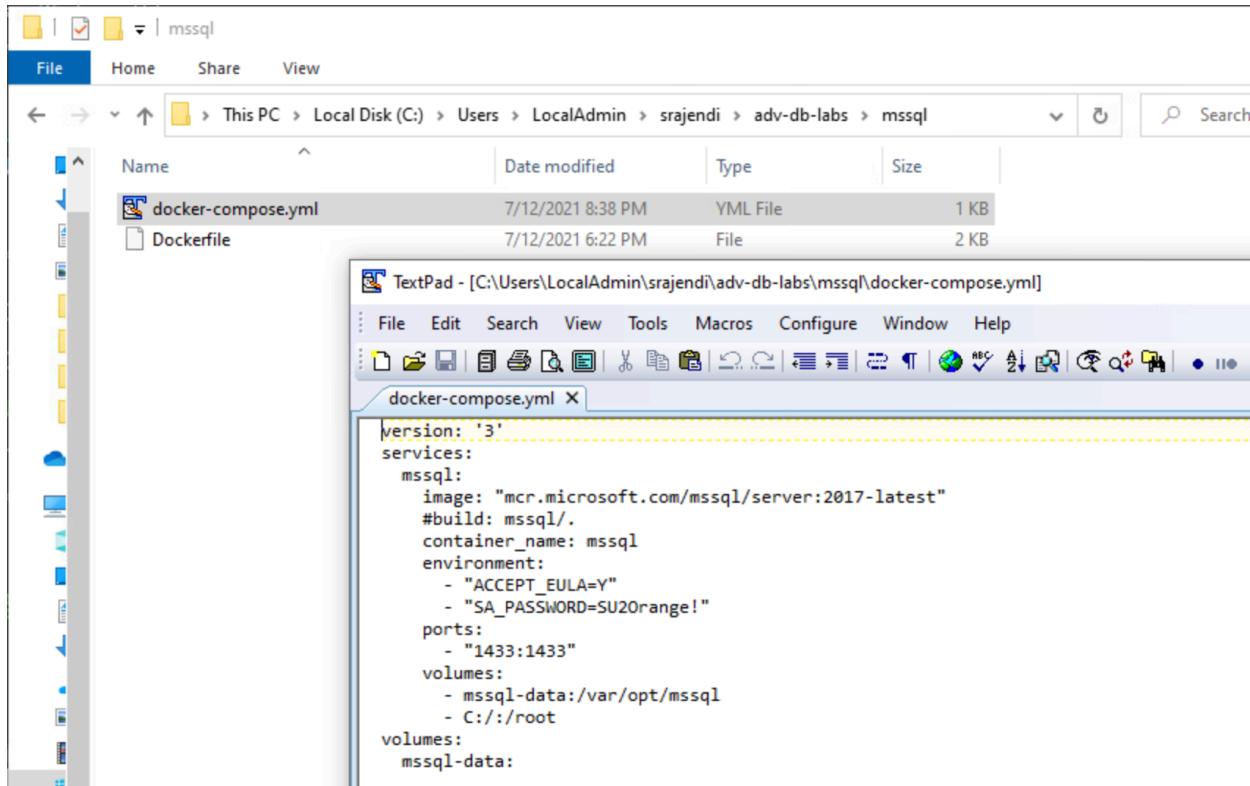
```
Administrator: Command Prompt
Microsoft Windows [Version 10.0.19041.1110]
(c) Microsoft Corporation. All rights reserved.

C:\WINDOWS\system32>cd C:\Users\LocalAdmin\srajendi\adv-db-labs\mssql

C:\Users\LocalAdmin\srajendi\adv-db-labs\mssql>docker-compose ps
Name      Command     State    Ports
-----
C:\Users\LocalAdmin\srajendi\adv-db-labs\mssql>docker-compose up -d
Creating network "mssql_default" with the default driver
Creating mssql ... done

C:\Users\LocalAdmin\srajendi\adv-db-labs\mssql>docker-compose ps
Name      Command     State    Ports
mssql   /opt/mssql/bin/nonroot_msg ...   Up      0.0.0.0:1433->1433/tcp,:::1433->1433/tcp

C:\Users\LocalAdmin\srajendi\adv-db-labs\mssql>
```



769-Win10Docker-srajendi

Enforce US Keyboard L

srajendi\_HW3.sql - localhost.demo (sa (55)) - Microsoft SQL Server Management Studio

File Edit View Query Project Tools Window Help

demo Execute New Query Object Explorer

SQLQuery3.sql - localhost.demo (sa (58)) srajendi\_HW3.sql - localhost.demo (sa (55)) srajendi\_HW2.sql - Local master (sa (56))

```
1 USE [demo]
2 GO
3 ****
4 Name: Sathish Kumar Rajendiran
5 SUID: 666555028
6 Email: srajendi@syr.edu
7 Date Due: 07/27/2021
8 Topic: Transactions and Temporal Tables
9 Homework #:3
10 ****
11 1. In the Demo database, create two tables:
12     a. The first table players should have columns player id (int pk), player name (varchar),
13         shots attempted (int), shots made (int)
14     b. The second table shots should have columns shot id (int pk), player id (int fk to players),
15         clock time (datetime), shot made (bit)
16     c. Add two players to the players table. Mary and Sue initialize the players with 0 shots
```

194 %

Messages Commands completed successfully.

194 %

Query executed successfully.

769-Win10Docker-srajendi

Enforce US Keyboard Lay

srajendi\_HW3.sql - localhost.demo (sa (55)) - Microsoft SQL Server Management Studio

File Edit View Query Project Tools Window Help

demo Execute New Query Object Explorer

SQLQuery3.sql - localhost.demo (sa (58)) srajendi\_HW3.sql - localhost.demo (sa (55)) srajendi\_HW2.sql - Local master (sa (56))

```
91 GO
92
93 SELECT * from dbo.players
94 GO
95 SELECT * from dbo.shots
96 GO
97
98 ****
99
100 2. Write transaction safe code as a stored procedure which when given a player id,
101     clock time, and whether the shot was made (bit value) will add the record to the shots table
102     and update the player record in the players table. For example, If Mary takes a shot
103     and makes it, then misses the next one, there would be two records in the shots table and
104     her row in the players table should have 2 attempt and 1 shot made.
105
106 Execute the stored procedure to demonstrate the transaction is ACID compliant.
```

769-Win10Docker-srajendi

File Edit View Query Project Tools Window Help

demo Execute

Object Explorer

```
189     select * from dbo.shots
190     select * from dbo.players
191     select * from dbo.DB_Errors
192
193  ****
194 3. Alter the players table to be a system-versioned temporal table.
195 */
196     ----alter dbo.players table to add hidden columns that are used as version columns
197     ALTER TABLE dbo.players
198         ----Add the system versioning history table
199         ADD StartTime DATETIME2 GENERATED ALWAYS AS ROW START
200             HIDDEN DEFAULT GETUTCDATE(),
201             EndTime DATETIME2 GENERATED ALWAYS AS ROW END
202             HIDDEN DEFAULT
203                 CONVERT(DATETIME2, '9999-12-31 23:59:59.9999999'),
204                 PERIOD FOR SYSTEM_TIME (StartTime, EndTime);
```

769-Win10Docker-srajendi

File Edit View Query Project Tools Window Help

demo Execute

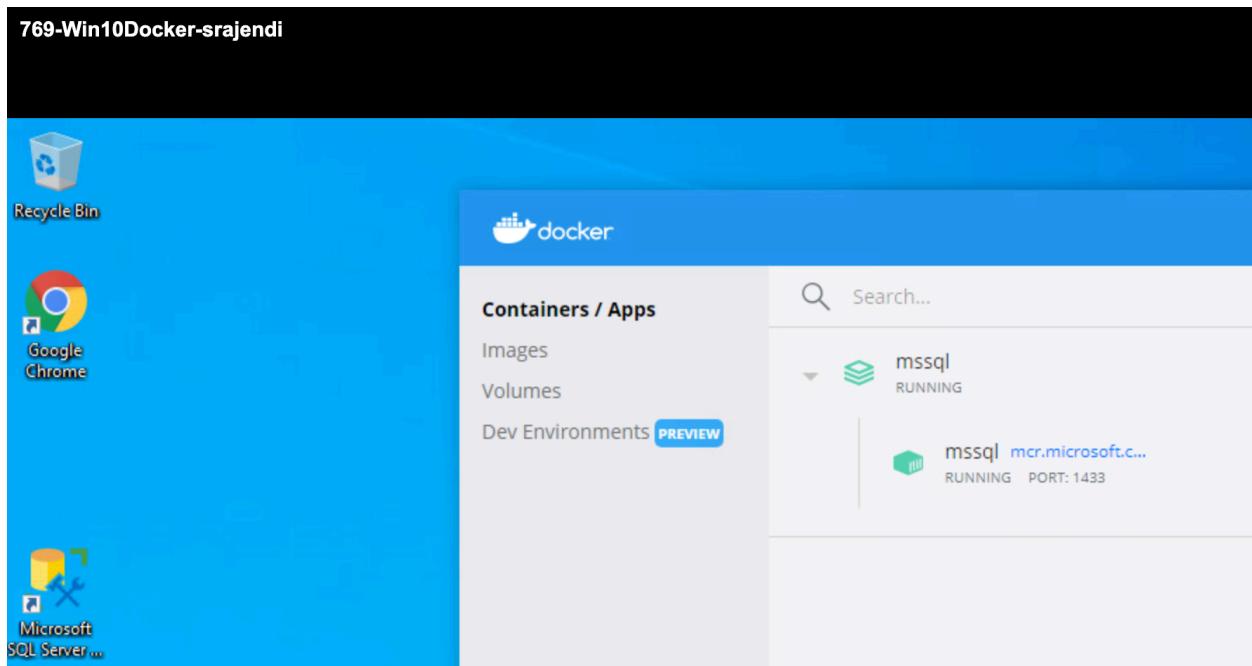
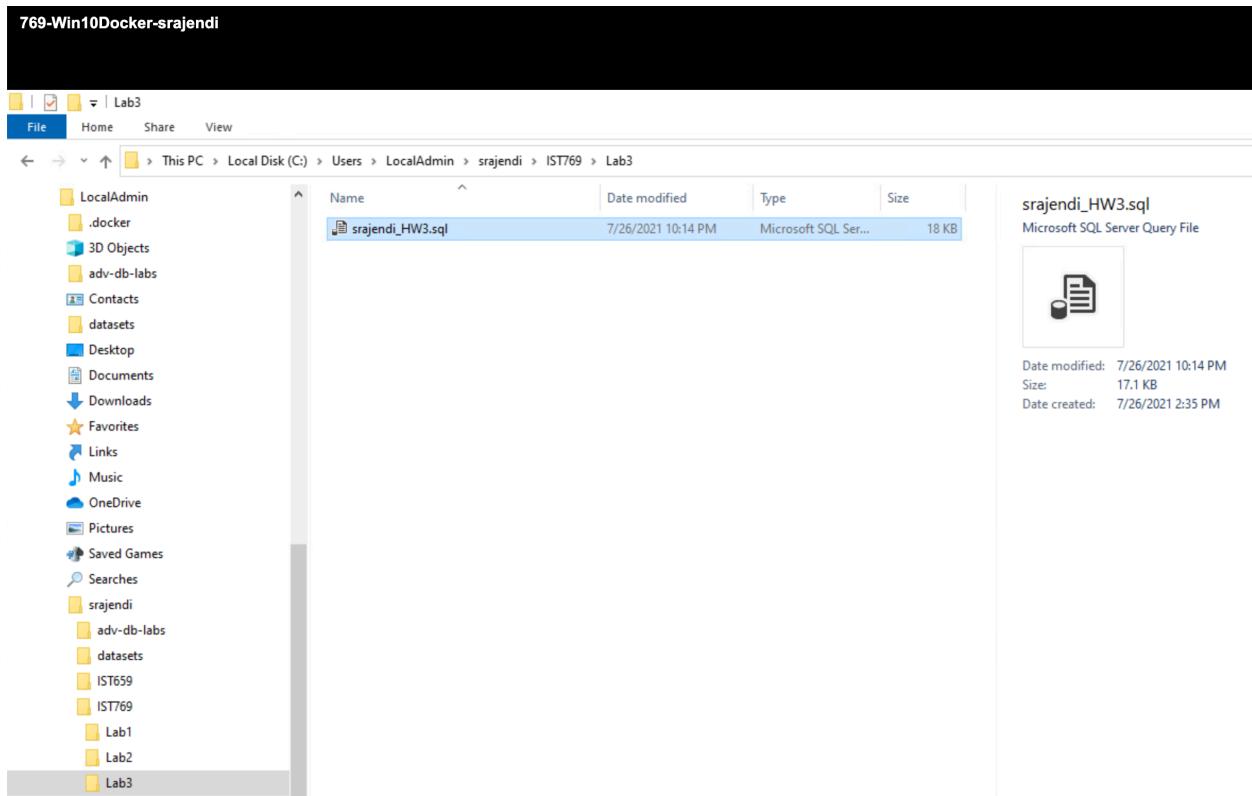
Object Explorer

```
213 ****
214 4. Execute your stored procedure from part 2 to create at least 15 shot records over a 5-minute period.
215 Make sure there are records in the first % of the 5-minute period
216 and at few in the last minute of the 5-minute period.
217 */
218     /* Delete all records from shots and players table */
219     --Delete from dbo.shots
220     --Go
221     --Delete from dbo.players
222     --Go
223     SELECT * FROM dbo.players
224     SELECT * FROM dbo.shots
225     --*****insert records*****
226     --INSERT INTO players (player_name, shots_attempted, shots_made)
227     --VALUES ('Mary', 0, 0),('Sue',0,0)
228
```

769-Win10Docker-srajendi

Enforce US Keyboard Layout

```
srajendi_HW3.sql - localhost.demo (sa (55)) - Microsoft SQL Server Management Studio
File Edit View Query Project Tools Window Help
New Query New Query Execute
demo Execute
SQLQuery3.sql - localhost.demo (sa (56)) srajendi_HW3.sql - localhost.demo (sa (55)) srajendi_HW2.sql - localhost.master (sa (56))
360 select * from dbo.players_history
361
362 ****
363 5. Write SQL queries to show:
364     a. The player statistics at the end of the 5-minute period (current statistics).
365     b. The player statistics exactly 2 minutes and 30 seconds into the period.
366     c. The player statistics in the last minute of the period.
367 ****
368
369 **** Cleaning up History Table ****
370     --- Turn Versioning Off
371     --ALTER TABLE dbo.players
372     --SET (SYSTEM_VERSIONING = OFF);
373     --GO
374
375
```



```
C:\Users\LocalAdmin\srajendi\adv-db-labs\mssql>docker-compose ps
Name      Command     State    Ports
-----
C:\Users\LocalAdmin\srajendi\adv-db-labs\mssql>docker-compose up -d
Creating network "mssql_default" with the default driver
Creating mssql ... done

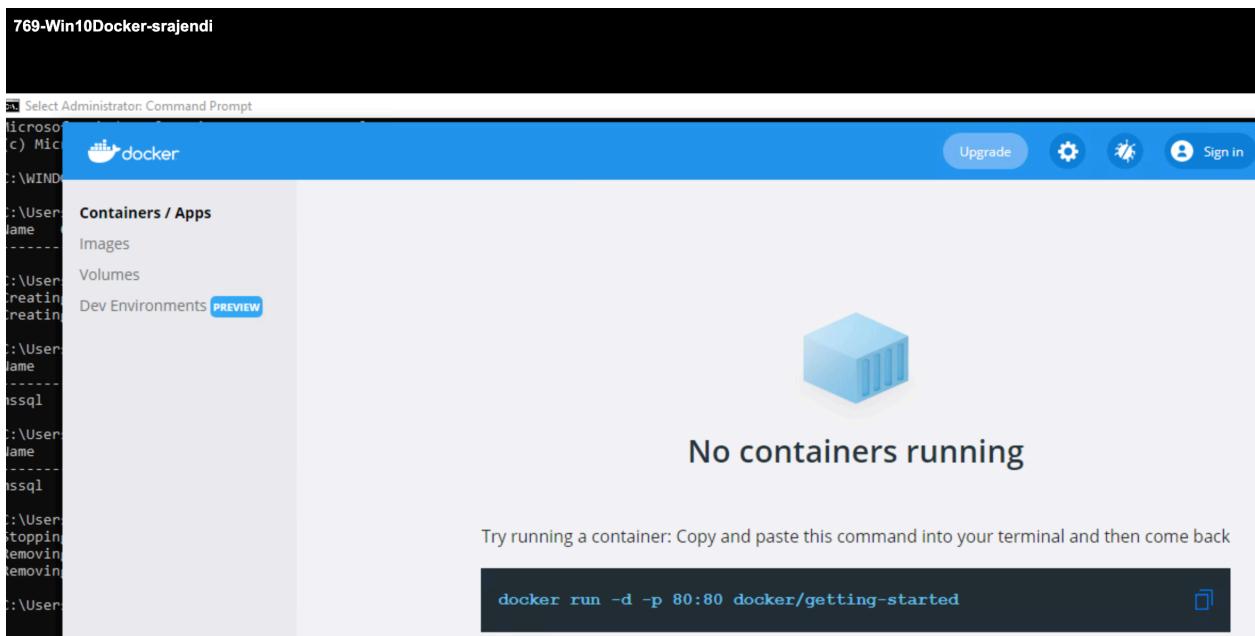
C:\Users\LocalAdmin\srajendi\adv-db-labs\mssql>docker-compose up -d
mssql is up-to-date

C:\Users\LocalAdmin\srajendi\adv-db-labs\mssql>docker-compose ps
Name      Command     State    Ports
-----
mssql   /opt/mssql/bin/nonroot_msg ... Up      0.0.0.0:1433->1433/tcp,:::1433->1433/tcp

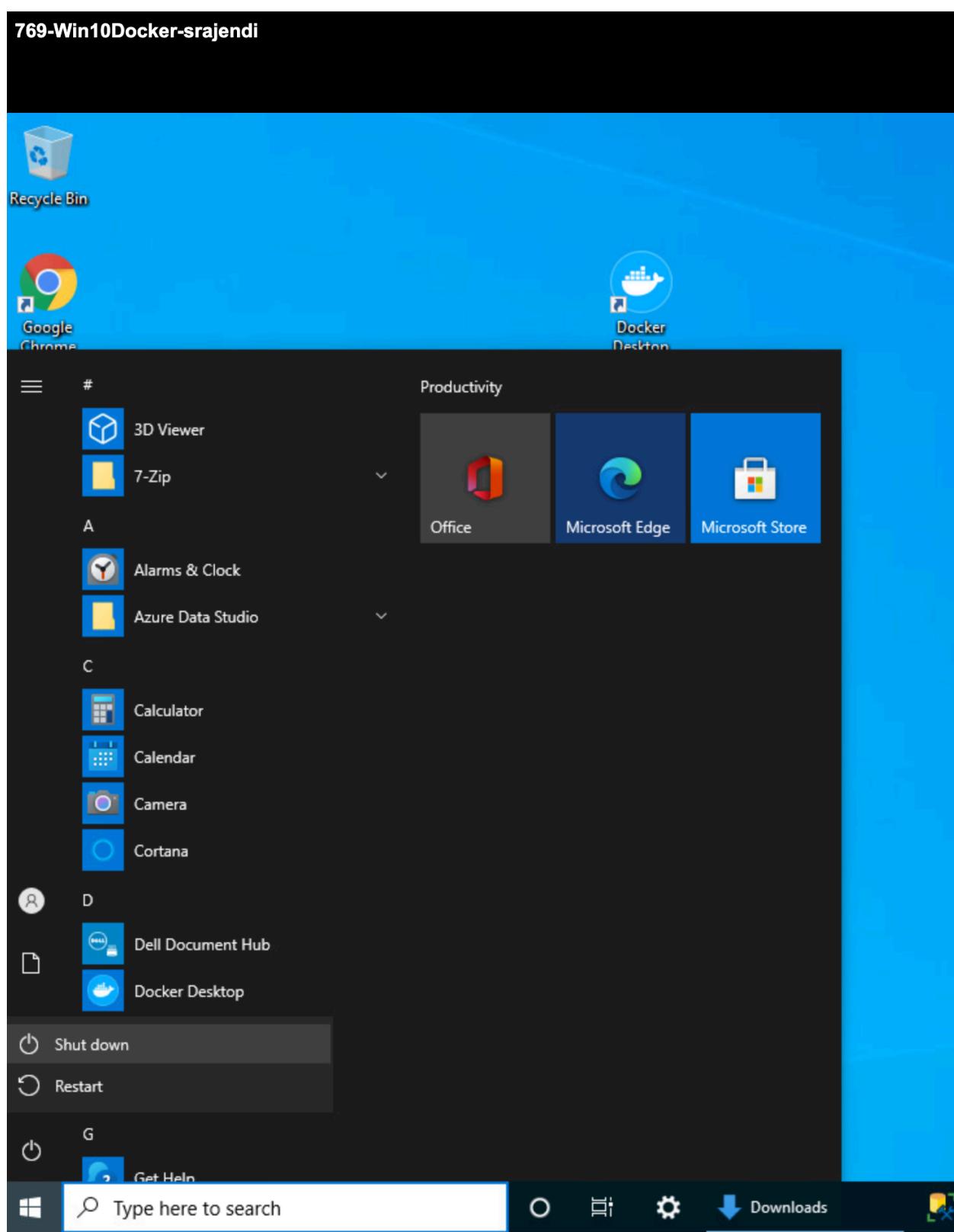
C:\Users\LocalAdmin\srajendi\adv-db-labs\mssql>docker-compose ps
Name      Command     State    Ports
-----
mssql   /opt/mssql/bin/nonroot_msg ... Up      0.0.0.0:1433->1433/tcp,:::1433->1433/tcp

C:\Users\LocalAdmin\srajendi\adv-db-labs\mssql>docker-compose down
Stopping mssql ... done
Removing mssql ... done
Removing network mssql_default

C:\Users\LocalAdmin\srajendi\adv-db-labs\mssql>
```



769-Win10Docker-srajendi



The screenshot shows a VMware web console interface for a virtual machine named "769-Win10Docker-srajendi". The top window displays a blue screen with a small circular progress bar in the center and the text "Shutting down" below it. The URL in the address bar is [vlab.ischool.syr.edu/ui/webconsole.html?vmlId=vm-11274&vmName=769-Win10Docker-srajendi&serverGuid=a15ed458-6d34-465c-bdcc-2514503108de](https://vlab.ischool.syr.edu/ui/webconsole.html?vmlId=vm-11274&vmName=769-Win10Docker-srajendi&serverGuid=a15ed458-6d34-465c-bdcc-2514503108de). The bottom window shows the same URL but with "&host=vlab.ischool.syr.edu" added, resulting in [vlab.ischool.syr.edu/ui/webconsole.html?vmlId=vm-11274&vmName=769-Win10Docker-srajendi&serverGuid=a15ed458-6d34-465c-bdcc-2514503108de&host=vlab.ischool.syr.edu](https://vlab.ischool.syr.edu/ui/webconsole.html?vmlId=vm-11274&vmName=769-Win10Docker-srajendi&serverGuid=a15ed458-6d34-465c-bdcc-2514503108de&host=vlab.ischool.syr.edu). Both windows have a toolbar at the top with links to Anaplan, Cloud Platform, Customer Master, Data Science, Data Strategy, Misc, and Time Converter.

The screenshot shows the vSphere Client interface for the same virtual machine. The left sidebar shows the folder structure: "vLab-Students" > "srajendi" > "769-Win10Docker-srajendi". The main pane displays the "Summary" tab for the VM. Key details shown include:

- Guest OS: Microsoft Windows 10 (64-bit)
- Compatibility: ESXi 6.7 Update 2 and later (VM version 15)
- VMware Tools: Not running, version:1133 (Current)
- More info link
- DNS Name: 769-Win10Docker-srajendi
- IP Addresses: None
- Host: (not explicitly listed)

Below the summary, there are sections for "VM Hardware" and "Related Objects" (which is currently empty). On the right side, there is a "Notes" section containing the following text:

pass: SU44orange!  
last-updated: 6/24/21  
VM-programs: Docker, Git, SSMS, MongoDB, Hadoop, Javadk

Buttons for "Edit Notes..." and "Launch Web Console" are also present.