

MSDA 3040/MSIT 3860 - FUNDAMENTALS DATA ENGINEERING



Project Title: Recreational Spring Open Gym Activities

GROUP NUMBER: 5

NAMES and CLARK IDs: Kanishma Subbiah - C70293277

Project Title: Recreational Spring Open Gym Activities

OVERVIEW:

The data is about **Recreational Spring Open Gym Activities**, comes from this website: <https://catalog.data.gov/dataset/recreation-spring-open-gym-activities>. It tells us about different activities, where they happen when they occur, and who can join. Using this data, we could see what activities are available when they happen, and for whom they are meant, all during the spring season.

ABSTRACT:

The project revolves around analyzing data related to Recreational Spring Open Gym Activities, sourced from Kaggle. The goal is to gain insights into various activities, their locations, timings, and target participants during the spring season. The data is processed through Extract, Transform, Load (ETL) processes, normalized, and visualized to offer a comprehensive understanding of recreational activities.

PROBLEM STATEMENT:

The dataset initially presented challenges related to cleanliness, normalization, and visualization. Issues included combined address fields, redundant information, and the need for a structured data model. Addressing these challenges was crucial for deriving meaningful insights and presenting information effectively.

1. WHY IS THIS TABLE NOT IN 1NF?

Activity	Recreation Center	Address	Phone Number	Age Requirements	Days of Week	Times	Address/Location
Volleyball	Praisner Community Center	14906 Old Columbia Pike	240-777-4970	18 & Up	Thursday	7:00pm - 9:30pm	14906 Old
Basketball	Upper County Community Center	8201 Emory Grove Rd	240-777-8077	17 & Under	Monday & Wednesday	6:00pm - 8:00pm	8201 Emory Grove
Basketball	North Potomac Community Center	13850 Travilah Rd	240-773-4800	All Ages	Sunday	12:00pm - 4:00pm	13850 Travilah Rd
Pickleball	Upper County Community Center	8201 Emory Grove Rd	240-777-8077	18 & Up	Monday	10:00am - 12:00pm	8201 Emory Grove
Badminton	North Potomac Community Center	13850 Travilah Rd	240-773-4800	17 & Under	Thursday	3:00pm - 6:00pm	13850 Travilah Rd

- In the given data, the house number and street address are combined in the same cell. This violates the principle of atomicity since a cell should only contain a single value.
- Two address columns suggest the presence of a repeating group, as each row should ideally represent a single entity. So, we have removed 1 address column to eliminate redundancy and conform to the first normal form (1NF). And, having two addresses indicates that there is a repeating group, as each should represent a single entity.

We have deleted the redundant address column and retained only a single column for the address, then we have removed the redundancy and taken a step toward conforming to the first normal form (1NF).

Activity	Recreation Center	Phone Number	Age Requirements	Days of Week	Times	Address/Location
Volleyball	Praisner Community Center	240-777-4970	18 & Up	Thursday	7:00pm - 9:30pm	14906 Old
Basketball	Upper County Community Center	240-777-8077	17 & Under	Monday & Wednesday	6:00pm - 8:00pm	8201 Emory Grove
Basketball	North Potomac Community Center	240-773-4800	All Ages	Sunday	12:00pm - 4:00pm	13850 Travilah Rd
Pickleball	Upper County Community Center	240-777-8077	18 & Up	Monday	10:00am - 12:00pm	8201 Emory Grove
Badminton	North Potomac Community Center	240-773-4800	17 & Under	Thursday	3:00pm - 6:00pm	13850 Travilah Rd

2. 0NF – 1NF

Activity	Recreation Center	Phone Number	Age Requirements	Days of Week	Times	Address/Location
Volleyball	Praisner Community Center	240-777-4970	18 & Up	Thursday	7:00pm - 9:30pm	14906 Old
Basketball	Upper County Community Center	240-777-8077	17 & Under	Monday & Wednesday	6:00pm - 8:00pm	8201 Emory Grove
Basketball	North Potomac Community Center	240-773-4800	All Ages	Sunday	12:00pm - 4:00pm	13850 Travilah Rd
Pickleball	Upper County Community Center	240-777-8077	18 & Up	Monday	10:00am - 12:00pm	8201 Emory Grove
Badminton	North Potomac Community Center	240-773-4800	17 & Under	Thursday	3:00pm - 6:00pm	13850 Travilah Rd

- We have restructured the data into separate columns for the start time, end time, house number, street, latitude, and longitude.

A	B	C	D	E	F	G	H	I	J	K	L	M
Activity	Recreation Center	House Number	Street Address	Latitude	Longitude	Phone Number	Age Requirements	Days of Week	Start Time	End Time	Recreation_info_id	Activity_schedule_id
Volleyball	Praisner Community Center	14906	Old Columbia Pike	-76.940764	39.101353	240-777-4970	18 & Up	Thursday	7:00pm	9:30pm	1	11
Basketball	Upper County Community Center	8201	Emory Grove Rd	-77.168899	39.149651	240-777-8077	17 & Under	Monday	6:00pm	8:00pm	2	12
Basketball	Upper County Community Center	8201	Emory Grove Rd	-77.168899	39.149651	240-777-8077	17 & Under	Wednesday	6:00pm	8:00pm	3	13
Basketball	North Potomac Community Center	13850	Travilah Rd	-77.232348	39.082916	240-773-4800	All Ages	Sunday	12:00pm	4:00pm	4	14
Pickleball	Upper County Community Center	8201	Emory Grove Rd	-77.168899	39.149651	240-777-8077	18 & Up	Monday	10:00am	12:00pm	5	15
Badminton	North Potomac Community Center	13850	Travilah Rd	-77.232348	39.082916	240-773-4800	17 & Under	Thursday	3:00pm	6:00pm	6	16

FIND ALL FUNCTIONAL DEPENDENCY:

A	B	C	D	E	F	G	H	I	J	K	L	M
Activity	Recreation Center	House Number	Street Address	Latitude	Longitude	Phone Number	Age Requirements	Days of Week	Start Time	End Time	Recreation_info_id	Activity_schedule_id
Volleyball	Praisner Community Center	14906	Old Columbia Pike	-76.940764	39.101353	240-777-4970	18 & Up	Thursday	7:00pm	9:30pm	1	11
Basketball	Upper County Community Center	8201	Emory Grove Rd	-77.168899	39.149651	240-777-8077	17 & Under	Monday	6:00pm	8:00pm	2	12
Basketball	Upper County Community Center	8201	Emory Grove Rd	-77.168899	39.149651	240-777-8077	17 & Under	Wednesday	6:00pm	8:00pm	3	13
Basketball	North Potomac Community Center	13850	Travilah Rd	-77.232348	39.082916	240-773-4800	All Ages	Sunday	12:00pm	4:00pm	4	14
Pickleball	Upper County Community Center	8201	Emory Grove Rd	-77.168899	39.149651	240-777-8077	18 & Up	Monday	10:00am	12:00pm	5	15
Badminton	North Potomac Community Center	13850	Travilah Rd	-77.232348	39.082916	240-773-4800	17 & Under	Thursday	3:00pm	6:00pm	6	16

B,L-> C,D,E,F,G

A,I,J,K,L,M ->H

Find the minimum cover:

- B,L-> C,D,E,F,G
- A,I,J,K,L,M->H

Step 1: Remove trivial FD.

None Found.

Step 2: Reduce the Right-Hand Side.

- $B, L \rightarrow C$
- $B, L \rightarrow D$
- $B, L \rightarrow E$
- $B, L \rightarrow F$
- $B, L \rightarrow G$
- $A, I, J, K, L, M \rightarrow H$

Step 3: Reduce the Left-Hand Side.

- $B \rightarrow C$
- $B \rightarrow D$
- $B \rightarrow E$
- $B \rightarrow F$
- $B \rightarrow G$
- $L \rightarrow C$
- $L \rightarrow D$
- $L \rightarrow E$
- $L \rightarrow F$
- $L \rightarrow G$
- $A \rightarrow H$
- $I \rightarrow H$
- $J \rightarrow H$
- $K \rightarrow H$
- $L \rightarrow H$

- $M \rightarrow H$

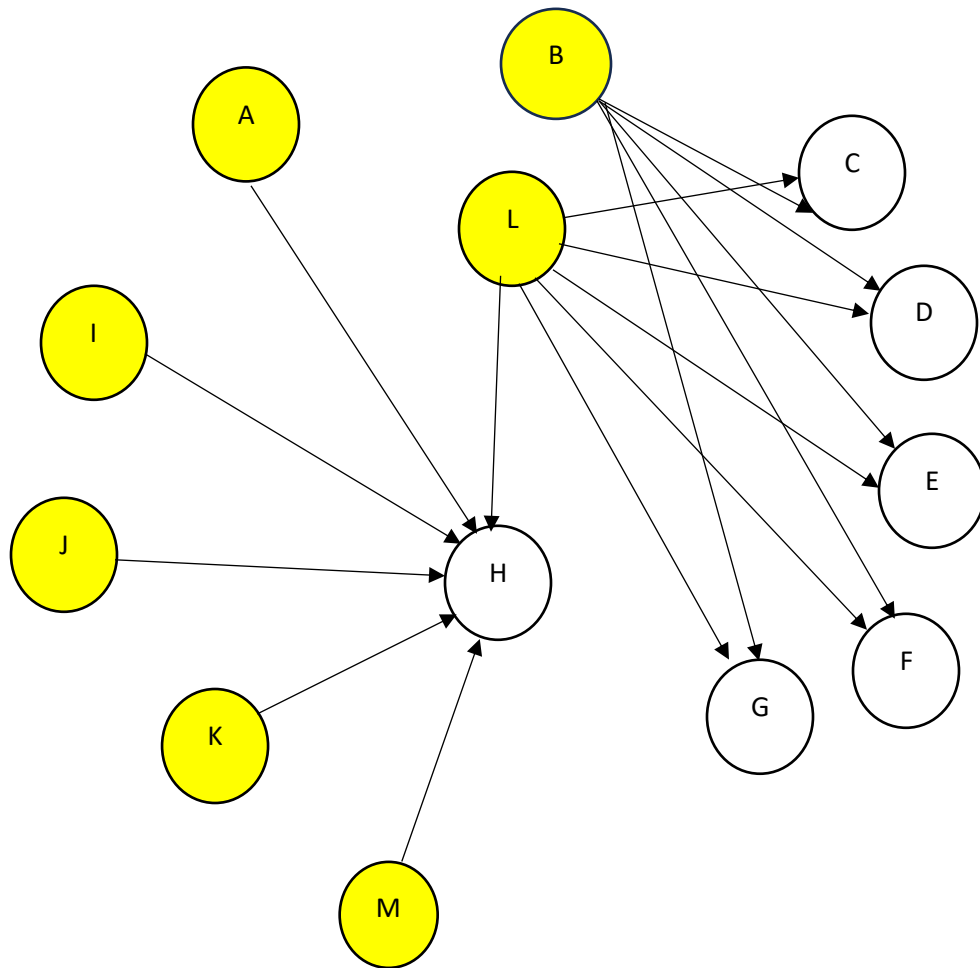
Step 4: Eliminate Redundancy.

- $B \rightarrow C$
- $B \rightarrow D$
- $B \rightarrow E$
- $B \rightarrow F$
- $B \rightarrow G$
- $L \rightarrow C$
- $L \rightarrow D$
- $L \rightarrow E$
- $L \rightarrow F$

- $L \rightarrow G$
- $A \rightarrow H$
- $I \rightarrow H$
- $J \rightarrow H$
- $K \rightarrow H$
- $L \rightarrow H$
- $M \rightarrow H$

SUPER KEY:

- $B \rightarrow C$
- $B \rightarrow D$
- $B \rightarrow E$
- $B \rightarrow F$
- $B \rightarrow G$
- $L \rightarrow C$
- $L \rightarrow D$
- $L \rightarrow E$
- $L \rightarrow F$
- $L \rightarrow G$
- $A \rightarrow H$
- $I \rightarrow H$
- $J \rightarrow H$
- $K \rightarrow H$
- $L \rightarrow H$
- $M \rightarrow H$



2 NF:

It is in 1NF.

Now, each relation is in 2NF because all non-prime attributes in each relation depend on the entire candidate key. There is no partial dependency, hence it is fully dependent on candidate keys.

$R(ABDEFGHIJKLM) \Rightarrow R(\underline{BLCDEFG}) + R(\underline{AIJKLMH})$

Now, it's in 2NF.

3NF:

It's in 2NF.

There is no transitive dependency. Hence, it is in 3NF form.

FINAL RELATIONS:

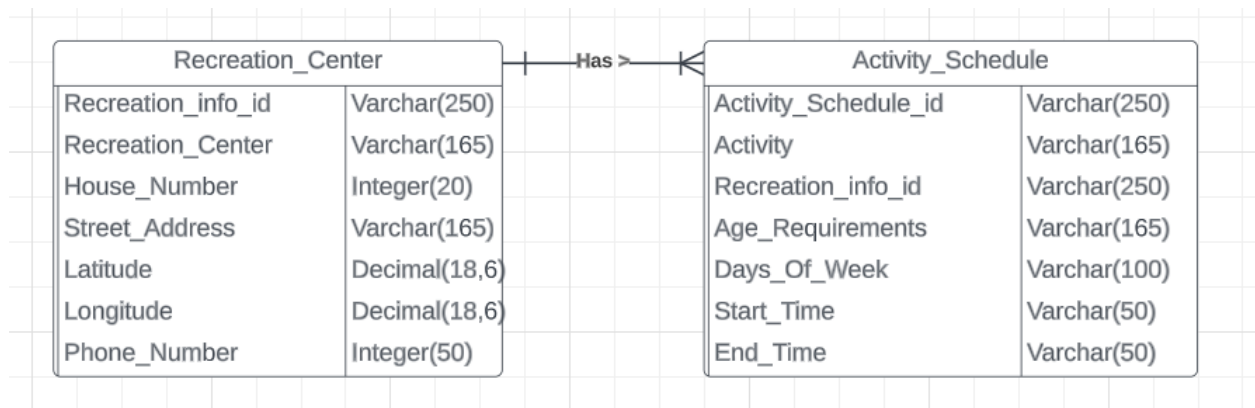
R(BLCDEFG)

Recreation Center	House Number	Street Address	Latitude	Longitude	Phone Number	Recreation_info_id
B	C	D	E	F	G	L
Praisner Community Center	14906	Old Columbia Pike	-76.940764	39.101353	240-777-4970	1
Upper County Community Center	8201	Emory Grove Rd	-77.168899	39.149651	240-777-8077	2
Upper County Community Center	8201	Emory Grove Rd	-77.168899	39.149651	240-777-8077	3
North Potomac Community Center	13850	Travilah Rd	-77.232348	39.082916	240-773-4800	4
Upper County Community Center	8201	Emory Grove Rd	-77.168899	39.149651	240-777-8077	5
North Potomac Community Center	13850	Travilah Rd	-77.232348	39.082916	240-773-4800	6

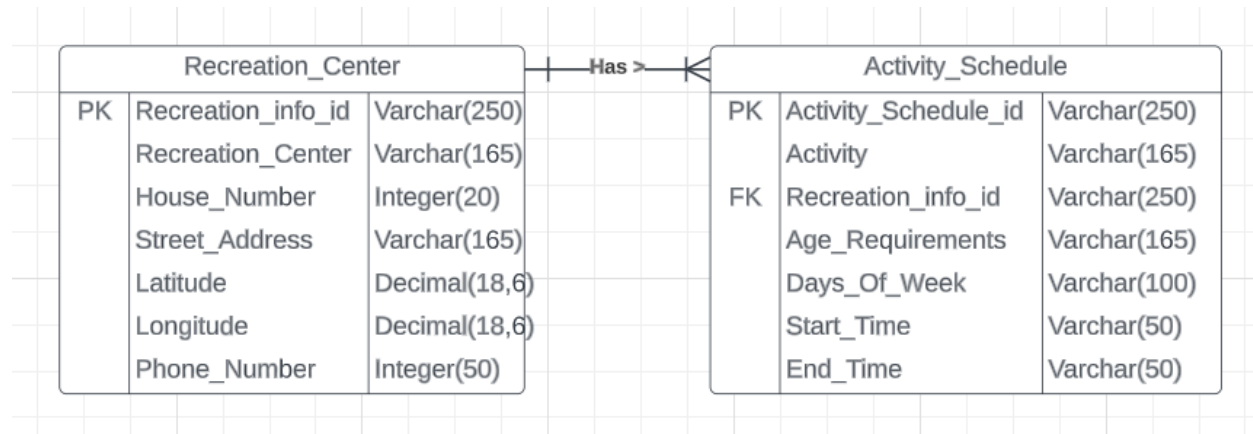
R(AIJKMLH)

Activity	Age Requirements	Days of Week	Start Time	End Time	Recreation_info_id	Activity_schedule_id
A	H	I	J	K	L	M
Volleyball	18 & Up	Thursday	7:00pm	9:30pm	1	11
Basketball	17 & Under	Monday	6:00pm	8:00pm	2	12
Basketball	17 & Under	Wednesday	6:00pm	8:00pm	3	13
Basketball	All Ages	Sunday	12:00pm	4:00pm	4	14
Pickleball	18 & Up	Monday	10:00am	12:00pm	5	15
Badminton	17 & Under	Thursday	3:00pm	6:00pm	6	16

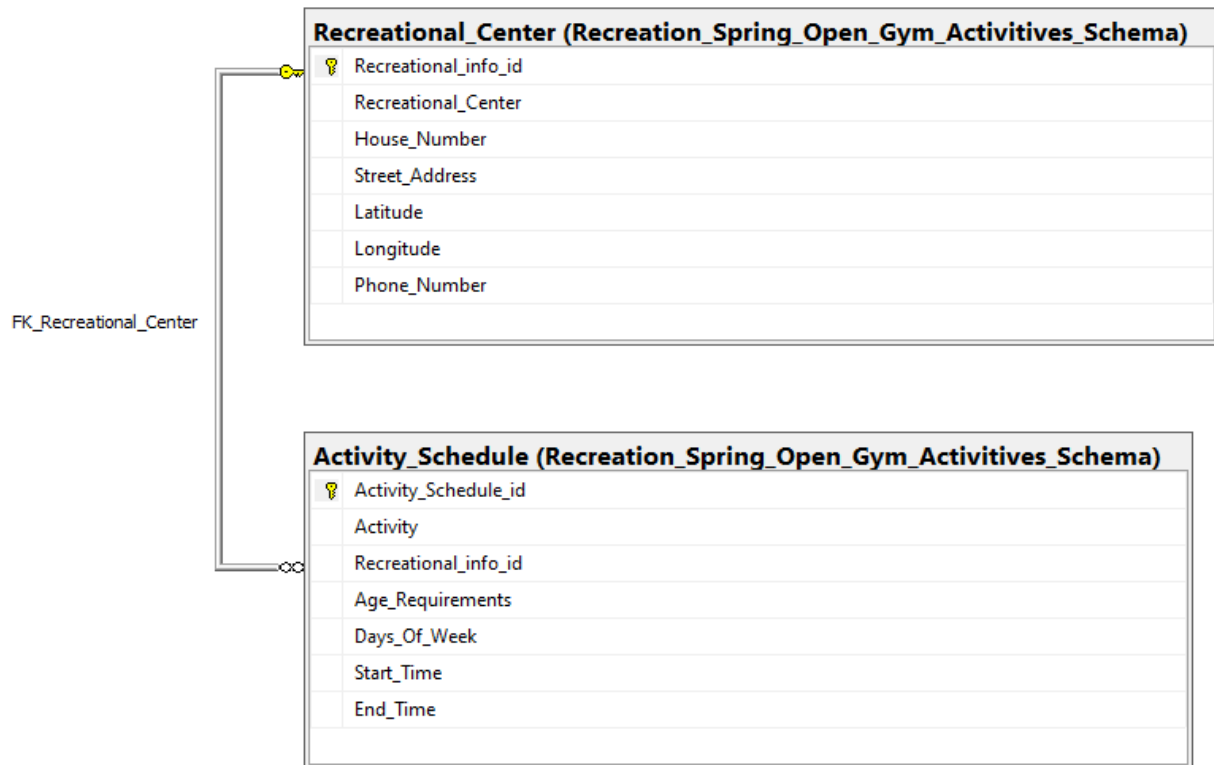
CONCEPTUAL DATA MODEL:



LOGICAL DATA MODEL:

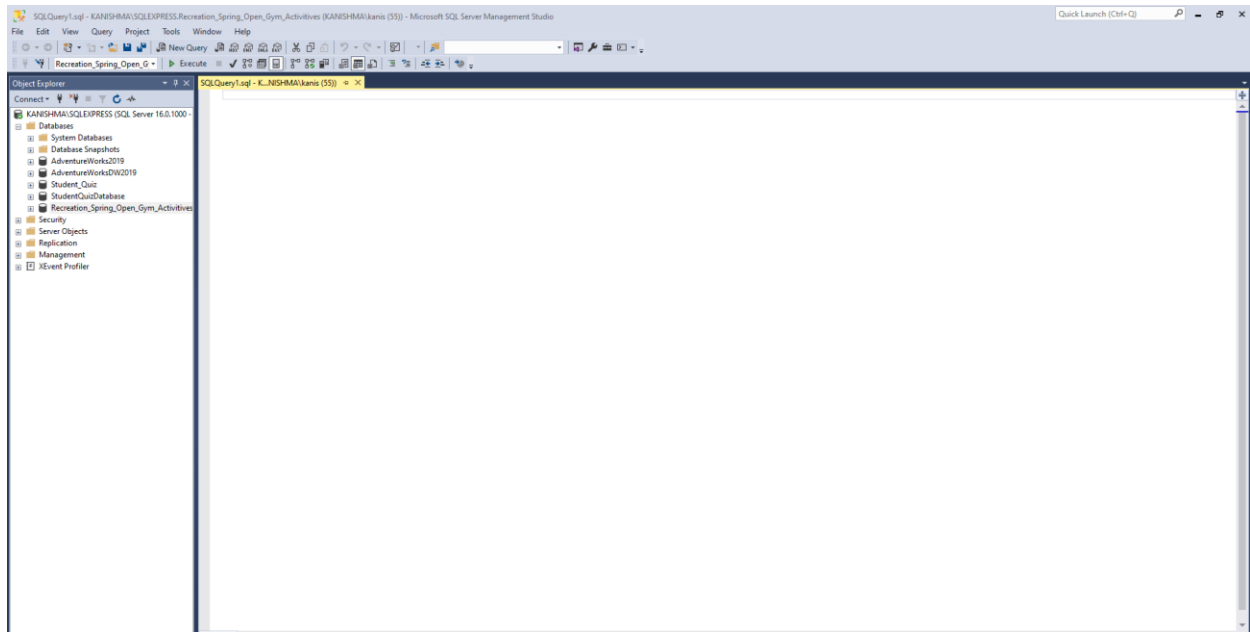


PHYSICAL DATA MODEL:

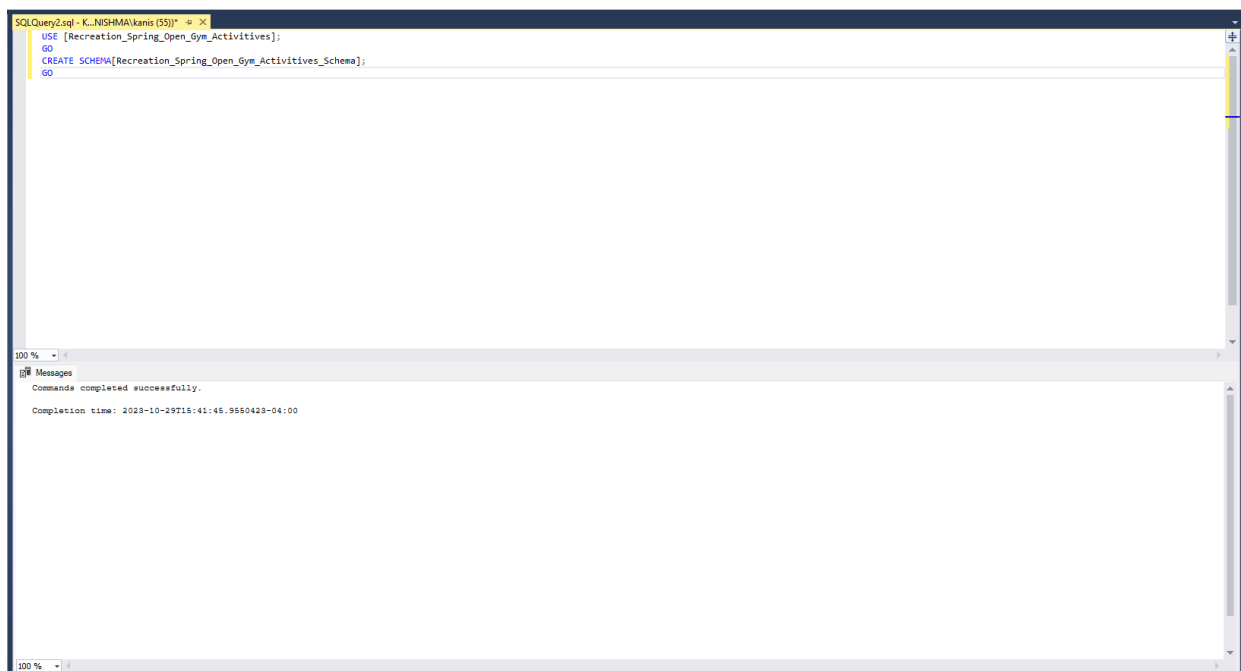


DDL Statement:

1) CREATE DATABASE:



2) CREATE SCHEMA:



3) CREATE A DDL STATEMENT FOR ALL NORMALIZED TABLES, WITH PRIMARY AND FOREIGN KEYS:

```
SQLQuery2.sql - K...NISHAM\kanis (55)*
CREATE TABLE Recreation_Spring_Open_Gym_Activities_Schema.Recreational_Center(
    Recreational_Info_id VARCHAR (250) NOT NULL,
    Recreational_Center VARCHAR(165) NOT NULL,
    House_Number INT NOT NULL,
    Street_Address VARCHAR(165) NOT NULL,
    Latitude DECIMAL(18,6),
    Longitude DECIMAL(18,6),
    Phone_Number INT
    CONSTRAINT PK_Recreational_Center PRIMARY KEY(Recreational_Info_id),
    CONSTRAINT Recreational_Center_Unique UNIQUE (Recreational_Center)
)
GO

100 %
Messages
Commands completed successfully.
Completion time: 2023-10-29T18:16:52.9660810-04:00
```

```
SQLQuery1.sql - K...NISHAM\kanis (55)*
CREATE TABLE Recreation_Spring_Open_Gym_Activities_Schema.Activity_Schedule (
    Activity_Schedule_id VARCHAR(250) NOT NULL,
    Activity VARCHAR(165) NOT NULL,
    Recreational_Info_id VARCHAR(250) NOT NULL,
    Age_Requirements VARCHAR(165) NOT NULL,
    Days_Of_Week VARCHAR(100) NOT NULL,
    Start_Time VARCHAR(50) NOT NULL,
    End_Time VARCHAR(50) NOT NULL,
    CONSTRAINT PK_Activity PRIMARY KEY (Activity_Schedule_id),
    CONSTRAINT FK_Recreational_Center
        FOREIGN KEY (Recreational_Info_id)
        REFERENCES Recreation_Spring_Open_Gym_Activities_Schema.Recreational_Center(Recreational_Info_id)
)
GO

100 %
Messages
Commands completed successfully.
Completion time: 2023-10-29T18:45:03.8638626-04:00
```

Physical Tables in SQL Server Database:

	Column Name	Data Type	Allow Nulls
🔑	Recreational_info_id	varchar(250)	<input type="checkbox"/>
	Recreational_Center	varchar(165)	<input type="checkbox"/>
	House_Number	int	<input type="checkbox"/>
	Street_Address	varchar(165)	<input type="checkbox"/>
	Latitude	decimal(18, 6)	<input type="checkbox"/>
	Longitude	decimal(18, 6)	<input type="checkbox"/>
▶	Phone_Number	int	<input type="checkbox"/>

	Column Name	Data Type	Allow Nulls
▶🔑	Activity_Schedule_id	varchar(250)	<input type="checkbox"/>
	Activity	varchar(165)	<input type="checkbox"/>
	Recreational_info_id	varchar(250)	<input type="checkbox"/>
	Age_Requirements	varchar(165)	<input type="checkbox"/>
	Days_Of_Week	varchar(100)	<input type="checkbox"/>
	Start_Time	varchar(50)	<input type="checkbox"/>
	End_Time	varchar(50)	<input type="checkbox"/>
			<input type="checkbox"/>

These are the 2 physical tables we created in the SQL Server Database.

Workflow of the ETL MODEL:

Our project has chosen to follow the ETL data modeling, and the workflow is as follows.



RENAME:

From the below screenshot, we have renamed the Address/Location – Split 2 field to Latitude field.

Age Requirements	Recreation Center	Days of Week	Times	Address/Location	Address/Location - S...	Latitude
12 & Up	Potomac Community Center	Saturday	2:00pm - 4:45pm	11315 Falls Rd(n/39 43483, -76 68069)	11315 Falls Rd	39 43483
All Ages	East County Community Center	Saturday	10:00am - 3:00pm	3310 Gateshead Manor Way(n/39 077368, -76 9423)	3310 Gateshead Manor Way	39 077368
All Ages	Upper County Community Center	Saturday	11:00am - 5:00pm	8201 Emory Grove Rd(n/39 149651, -77 168899)	8201 Emory Grove Rd	39 149651
All Ages	Germantown Community Center	Saturday	12:00pm - 2:45pm	18905 Kingsview Rd(n/39 164971, -77 287073)	18905 Kingsview Rd	39 164971
18 & Up	North Potomac Community Center	Monday & Wednesday	6:15pm - 8:45pm	13850 Travilah Rd(n/39 082916, -77 232348)	13850 Travilah Rd	39 082916
18 & Up	White Oak Community Center	Wednesday	6:00pm - 8:45pm	1700 April Ln(n/39 046674, -76 977052)	1700 April Ln	39 046674
Middle & High School	Germantown Community Center	Friday	3:00pm - 4:45pm	18905 Kingsview Rd(n/39 164971, -77 287073)	18905 Kingsview Rd	39 164971
18 & Up	East County Community Center	Wednesday	6:30pm - 8:50pm	3310 Gateshead Manor Way(n/39 077368, -76 9423)	3310 Gateshead Manor Way	39 077368
All Ages	Coffield Community Center	Saturday	9:30am - 6:00pm	2450 Lyttonsville Rd(n/38 999687, -77 050943)	2450 Lyttonsville Rd	38 999687
18 & Up	Coffield Community Center	Tuesday	6:00pm - 4:45pm	2450 Lyttonsville Rd(n/38 999687, -77 050943)	2450 Lyttonsville Rd	38 999687
18 & Up	Longwood Community Center	Saturday	3:00pm - 5:00pm	8700 Piney Branch Rd(n/38 998965, -76 997846)	8700 Piney Branch Rd	38 998965
Gr 6th - 12th	Longwood Community Center	Saturday	1:00pm - 3:00pm	8700 Piney Branch Rd(n/38 998965, -76 997846)	8700 Piney Branch Rd	38 998965
18 & Up	Lavton Community Center	Tuesday	6:00pm - 9:00pm	4301 Willow Ln(n/43 093237, -89 568853)	4301 Willow Ln	43 093237
18 & Up	Mid County Community Center	Tuesday	6:00pm - 4:45pm	2004 Queensguard Rd(n/39 087347, -77 042882)	2004 Queensguard Rd	39 087347
18 & Up	North Potomac Community Center	Tuesday	6:15pm - 8:45pm	13850 Travilah Rd(n/39 082916, -77 232348)	13850 Travilah Rd	39 082916
18 & Up	Ross Boddy Community Center	Monday & Wednesday	12:30pm - 2:30pm	18529 Brooke Rd(n/39 159587, -77 032656)	18529 Brooke Rd	39 159587
55 & Up	Clara Barton Community Center	Thursday	3:30pm - 4:30pm	14625 Bauer Dr(n/39 095357, -77 109505)	14625 Bauer Dr	39 095357
18 & Up	Long Branch Community Center	Thursday	7:00pm - 9:30pm	8700 Piney Branch Rd(n/38 998965, -76 997846)	8700 Piney Branch Rd	38 998965

DATA CLEAN_UP:

TRIM:

The below picture shows that we have cleaned up the trim spaces that has been unwantedly equipped by the Address/Location – Split 3 Attribute. Thus, Spaces have been removed from beginning and end of the field.

Address/Location - S...	Address/Location - S...
39 43483, -76 68069	11315 Falls Rd
39 077368, -76 9423	3310 Gateshead Manor Way
39 149651, -77 168899	8201 Emory Grove Rd
39 164971, -77 287073	18905 Kingsview Rd
39 082916, -77 232348	13850 Travilah Rd
39 046674, -76 977052	1700 April Ln
39 164971, -77 287073	18905 Kingsview Rd
39 077368, -76 9423	3310 Gateshead Manor Way
38 999687, -77 050943	2450 Lyttonsville Rd
38 999687, -76 997846	8700 Piney Branch Rd
38 998965, -76 997846	8700 Piney Branch Rd
43 093237, -89 568853	4301 Willow Ln
39 087347, -77 042882	2004 Queensguard Rd
39 082916, -77 232348	13850 Travilah Rd
39 159587, -77 032656	18529 Brooke Rd
39 095357, -77 109505	14625 Bauer Dr
38 998965, -76 997846	8700 Piney Branch Rd

REMOVE PUNCTUATIONS:

Removing punctuation is also one of the clean up step. Where we could get the entire column by eliminating punctuations from it.

The screenshot shows the Tableau Prep Builder interface. The workflow includes steps: Clean 1, Print 1, Clean 2, Aggregate 1, Clean 3, and Output. The 'Clean 1' step is selected, and the 'Remove Punctuation' option is highlighted in the 'Changes (21)' pane. The 'Edit Field' dialog is open for the 'Phone Number' field, showing the formula: `REGEXP_REPLACE([Phone Number], '[^0-9]{1,}', '')`. The 'Reference' pane shows the 'ABS(number)' function, which returns the absolute value of the given number. The data preview table shows columns: Activity, Address/Location - S..., and Latitude. The data rows include various sports activities and their locations.

FILTERING DATA:

We need to filter out the null values from the list, in order to do that we have used Exclude by using filter option.

The screenshot shows the Tableau Prep Builder interface. The workflow includes steps: Clean 1, Print 1, Clean 2, Aggregate 1, Clean 3, and Output. The 'Clean 1' step is selected, and the 'Filter' option is highlighted in the 'Changes (21)' pane. The 'Edit Filter' dialog is open, showing the formula: `NOT (ISNULL([Days of Week]))`. The 'Reference' pane shows the 'ABS(number)' function, which returns the absolute value of the given number. The data preview table shows columns: Activity, Address/Location - S..., and Latitude. The data rows include various sports activities and their locations.

CALCULATED FIELD:

To add an auto generated field to construct `Recreational_Center_ID`, we have created a calculated field by using the formula `{ORDERBY [Recreation_Center] ASC:ROW_NUMBER()}`.

The screenshot shows the Tableau Prep Builder interface. A workflow is visible with steps: Clean 4, Clean 5, and Output. A 'Calculated Field' dialog box is open, showing the formula `{ORDERBY [Recreation_Center] ASC:ROW_NUMBER()}` for the field name `Recreational_Center_ID`. The 'Reference' dropdown is set to 'All'. The 'Apply' button is highlighted. Below the dialog, a table of data is visible, showing columns for Recreation Center, House Number, Street Name, Latitude, Longitude, and Phone Number. The table lists 19 recreation centers, including Bauer Drive Community Center, Clara Barton Community Center, and others.

LOADING THE DATA TO THE TABLES:

At last, after cleaning, joining and aggregation process are dataset is ready to get deployed. We have connected to the MICROSOFT SQL SERVER, to load the data directly from staging tables to normalized tables. Below given are the screenshots.

The screenshot shows the 'Output' section of Tableau Prep Builder. It displays a table with 7 fields: `Recreational_Center_ID`, `Recreation Center`, `House Number`, `Street Name`, `Latitude`, `Longitude`, and `Phone Number`. The table contains 19 rows of data, corresponding to the 19 recreation centers listed in the previous screenshot. The 'Write Options' are set to 'Append to table'. A 'Run Flow' button is visible at the bottom left.

Output 2 7 fields

Save output to: Database

Settings Custom SQL

Table

Connection: KANISHMA\SQLEXPRESS

Write Options: Select an option to create or update your output table. Full refresh Append to table

Run Flow

Write 7 of 7 fields to the table "Stg_Activity_Schedule" in KANISHMA\SQLEXPRESS

Activity	Activity_Schedule_ID	Recreational_Center_ID	Age Requirements	Days of Week	Start Time	End Time
Badminton	1	4	All Ages	Saturday	12:00pm	2:00pm
Badminton	2	10	18 & Up	Tuesday	6:00pm	8:45pm
Badminton	3	7	18 & Up	Thursday	6:00pm	9:00pm
Badminton	4	18	18 & Up	Wednesday	6:00pm	8:45pm
Badminton	5	17	18 & Up	Saturday	9:00am	11:00am
Badminton	6	6	18 & Up	Sunday	2:30pm	4:45pm
Badminton	7	12	All Ages	Saturday	10:15am	12:00pm
Badminton	8	1	18 & Up	Tuesday	6:00pm	9:45pm
Badminton	9	19	18 & Up	Monday	5:00pm	9:00pm
Badminton	10	12	18 & Up	Monday	6:15pm	8:50pm
Badminton	11	11	17 & Under	Thursday	3:00pm	6:00pm
Badminton	12	13	12 & Up	Saturday	2:00pm	4:45pm
Badminton	13	5	18 & Up	Thursday	6:00pm	9:00pm
Badminton	14	11	55 & Up	Thursday	9:00am	12:00pm
Badminton	15	19	18 & Up	Saturday	9:30am	12:00pm
Badminton	16	11	18 & Up	Thursday	6:15pm	8:45pm
Badminton	17	3	18 & Up	Thursday	6:00pm	8:45pm
Badminton	18	11	All Ages	Sunday	12:00pm	4:00pm
Badminton	19	17	18 & Up	Tuesday	6:00pm	9:30pm
Badminton	20	14	18 & Up	Tuesday	6:30pm	8:30pm
Badminton	21	6	18 & Up	Thursday	6:00pm	8:45pm

RESULTS OF LOADING in SQL Server:

By using a select query, the results show that the raw data has been cleaned and loaded into the finalized two tables and they are:

RECREATION TABLE:

SQLQuery7.sql - K...\NISHMA\kanis (58))* SQLQuery6.sql - K...\NISHMA\kanis (71))*

SELECT * FROM dbo.Stg_Recreational_Center;

100 %

Results Messages

	Recreation Center	Recreational_Center_ID	House Number	Street Name	Latitude	Longitude	Phone Number
1	Bauer Drive Community Center	1	14625	Bauer Dr	39.095357	-77.109505	2407776922
2	Clara Barton Community Center	2	14625	Bauer Dr	39.095357	-77.109505	2407776922
3	Coffield Community Center	3	2450	Lyttonsville Rd	38.999687	-77.050943	2407774900
4	Damascus Community Center	4	25520	Oak Dr	41.51656	-80.028597	2407776930
5	East County Community Center	5	3310	Gateshead Manor Way	39.077368	-76.942378	2407778090
6	Germantown Community Center	6	18905	Kingsview Rd	39.164971	-77.287073	2407778095
7	Lawton Community Center	7	4301	Willow Ln	43.093237	-89.568853	2407776855
8	Long Branch Community Center	8	8700	Piney Branch Rd	38.998965	-76.997846	2107776965
9	Longwood Community Center	9	8700	Piney Branch Rd	38.998965	-76.997846	2107776965
10	Mid County Community Center	10	2004	Queensguard Rd	39.087347	-77.042882	2407776820
11	North Potomac Community Center	11	13850	Travilah Rd	39.082916	-77.232348	24077734800
12	Plum Gar Community Center	12	19561	Scenery Dr	39.177047	-77.233861	2407774919
13	Potomac Community Center	13	11315	Falls Rd	39.43483	-76.68069	2407776960
14	Prairies Community Center	14	14906	Old Columbia Pike	39.101353	-76.940764	2407774970
15	Ross Boddy Community Center	15	18529	Brooke Rd	39.159587	-77.032656	2407778050
16	Scotland Community Center	16	7700	Scotland Drive	39.031479	-77.159068	2407778075
17	Upper County Community Center	17	8201	Emory Grove Rd	39.149651	-77.168899	2407778077
18	White Oak Community Center	18	1700	April Ln	39.046674	-76.977052	2407776940
19	Wisconsin Place Community Center	19	5311	Friendship Blvd	38.962173	-77.088959	2407778088

Activity_Schedule Table:

SQLQuery7.sql - K:\NISHMA\kanis (58)) * SQLQuery6.sql - K:\NISHMA\kanis (71)) *

```
SELECT * FROM dbo.Stg_Activity_Schedule;
```

100 %

Results Messages

	Activity	Activity_Schedule_ID	Recreational_Center_ID	Age Requirements	Days of Week	Start Time	End Time
1	Badminton	1	4	All Ages	Saturday	12:00pm	2:00pm
2	Badminton	2	10	18 & Up	Tuesday	6:00pm	8:45pm
3	Badminton	3	7	18 & Up	Thursday	6:00pm	9:00pm
4	Badminton	4	18	18 & Up	Wednesday	6:00pm	8:45pm
5	Badminton	5	17	18 & Up	Saturday	9:00am	11:00am
6	Badminton	6	6	18 & Up	Sunday	2:30pm	4:45pm
7	Badminton	7	12	All Ages	Saturday	10:15am	12:00pm
8	Badminton	8	1	18 & Up	Tuesday	6:00pm	9:45pm
9	Badminton	9	19	18 & Up	Monday	5:00pm	9:00pm
10	Badminton	10	12	18 & Up	Monday	6:15pm	8:50pm
11	Badminton	11	11	17 & Under	Thursday	3:00pm	6:00pm
12	Badminton	12	13	12 & Up	Saturday	2:00pm	4:45pm
13	Badminton	13	5	18 & Up	Thursday	6:00pm	9:00pm
14	Badminton	14	11	55 & Up	Thursday	9:00am	12:00pm
15	Badminton	15	19	18 & Up	Saturday	9:30am	12:00pm
16	Badminton	16	11	18 & Up	Thursday	6:15pm	8:45pm
17	Badminton	17	3	18 & Up	Thursday	6:00pm	8:45pm
18	Badminton	18	11	All Ages	Sunday	12:00pm	4:00pm
19	Badminton	19	17	18 & Up	Tuesday	6:00pm	9:30pm
20	Badminton	20	14	18 & Up	Tuesday	6:30pm	8:30pm
21	Badminton	21	6	18 & Up	Thursday	6:00pm	8:45pm
22	Basketball	22	11	55 & Up	Wednesday	9:00am	12:00pm
23	Basketball	23	12	Middle & High School	Monday	2:30pm	4:30pm
24	Basketball	24	19	18 & Up	Sunday	3:00pm	5:00pm
25	Basketball	25	18	Ages 11-17	Friday	3:00pm	6:00pm
26	Basketball	26	11	17 & Under	Monday	3:00pm	6:00pm
27	Basketball	27	7	17 & Under	Monday	3:00pm	5:00pm
28	Basketball	28	3	All Ages	Saturday	9:30am	6:00pm
29	Basketball	29	5	18 & Up	Monday	10:00am	2:00pm
30	Basketball	30	9	Gr 6th - 12th	Thursday	3:00pm	5:45pm
31	Basketball	31	1	Ages 12 - 17	Monday	2:30pm	5:45pm
32	Basketball	32	18	18 & Up	Saturday	2:00pm	5:00pm

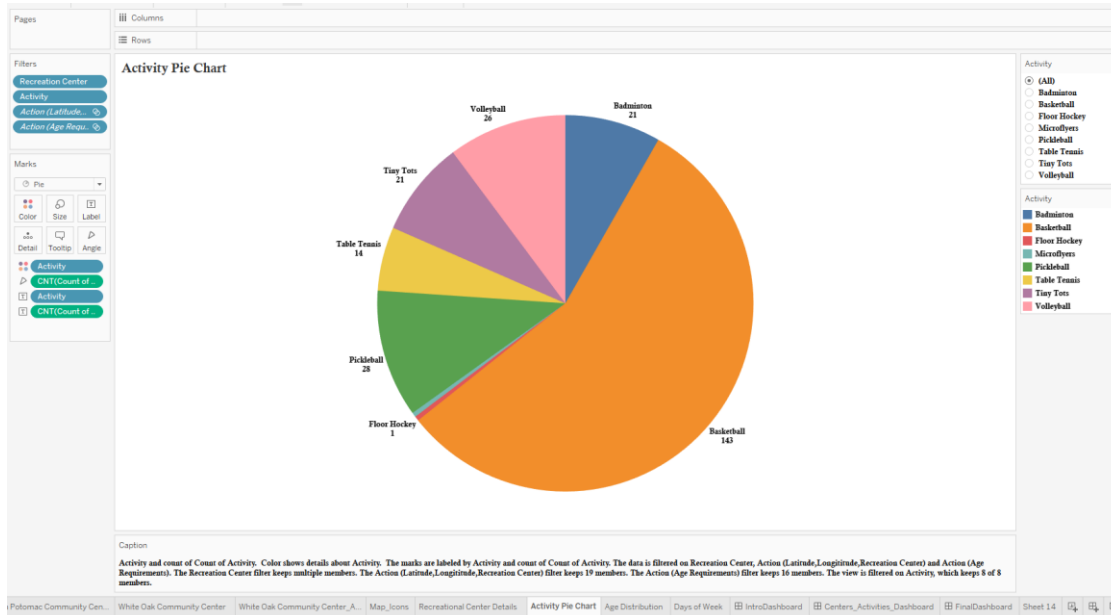
Query executed successfully.

DATA VISUALIZATION:

Data visualization plays a crucial role in conveying insights from the processed data in a comprehensible and visually appealing manner. In this project, various visualization techniques were applied:

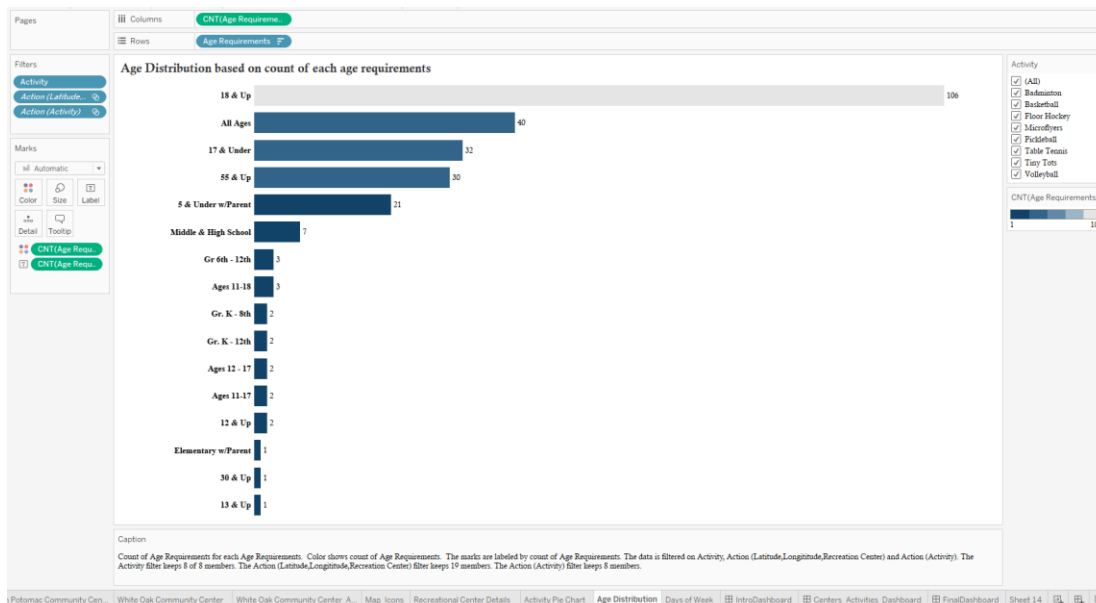
1. PIE CHART:

A pie chart was used to visually represent the frequency of each activity conducted in recreational centers. This chart offers a quick and intuitive understanding of the distribution of activities.



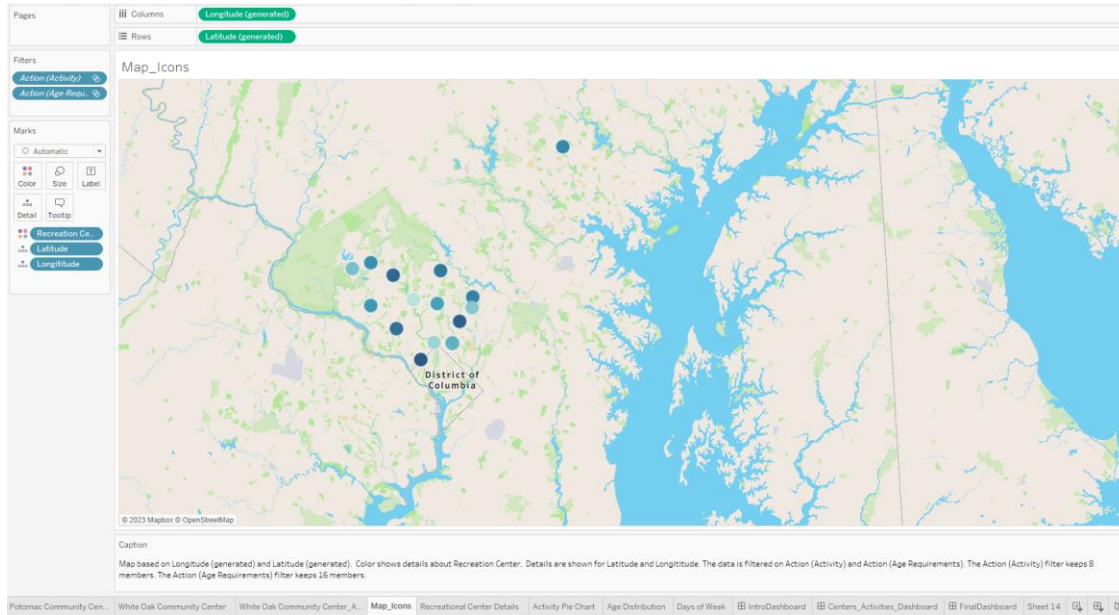
2. BAR CHART:

A bar chart was employed to display the age distribution based on the count of each age group. This visualization helps in understanding which age groups participate more frequently in recreational activities.



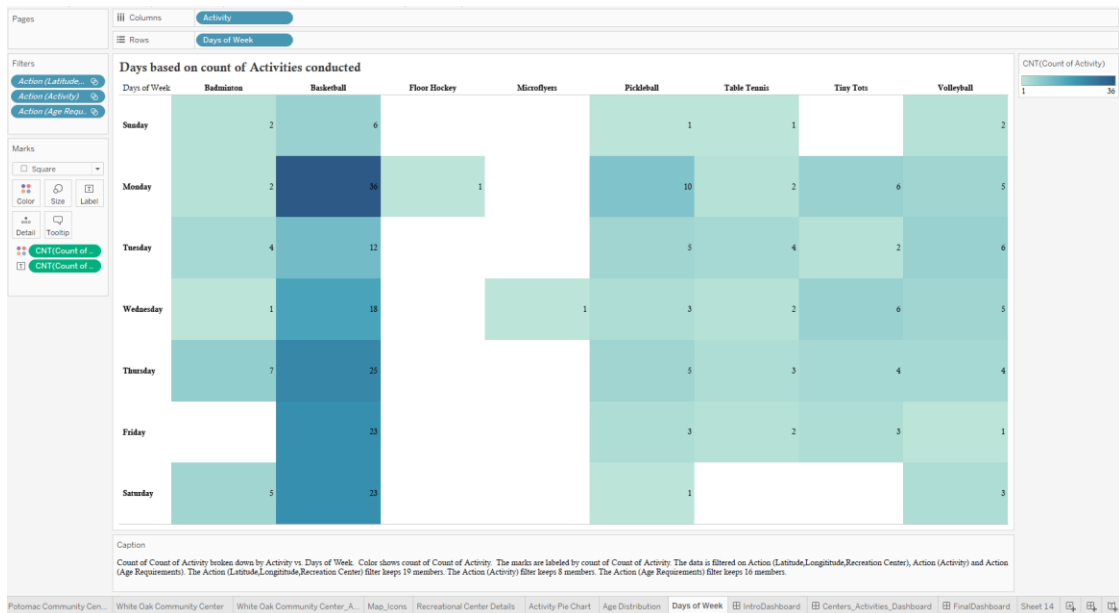
3. GEOGRAPHICAL MAP:

A geographical map was utilized to illustrate the areas with the highest concentration of recreational centers conducting activities. Each center's address details were incorporated using tooltips for additional information.



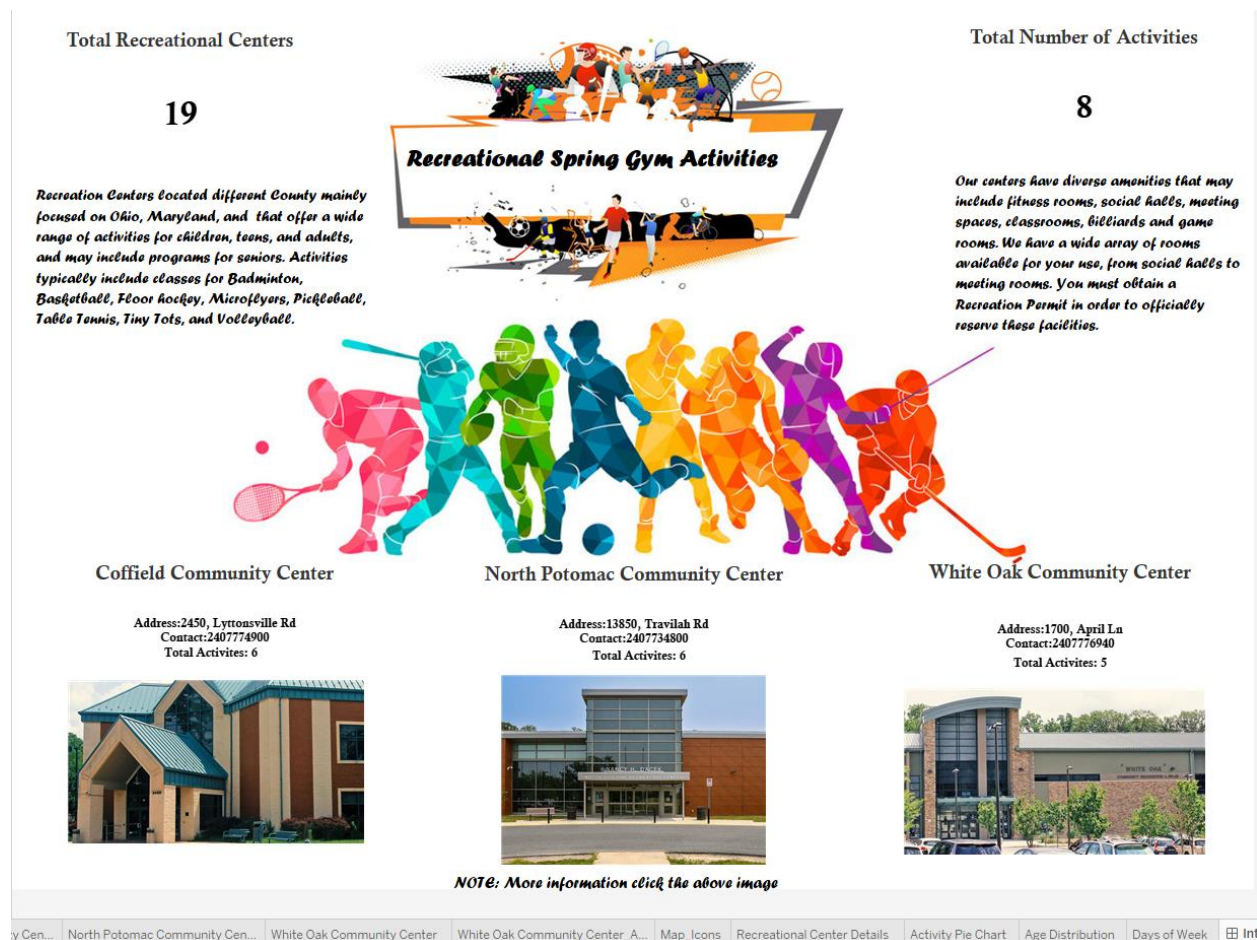
4. TABLE VISUALIZATION:

A highlighted table was employed to present the days of the week with the highest activity counts. This tabular format makes it easy to identify the peak days for recreational activities.



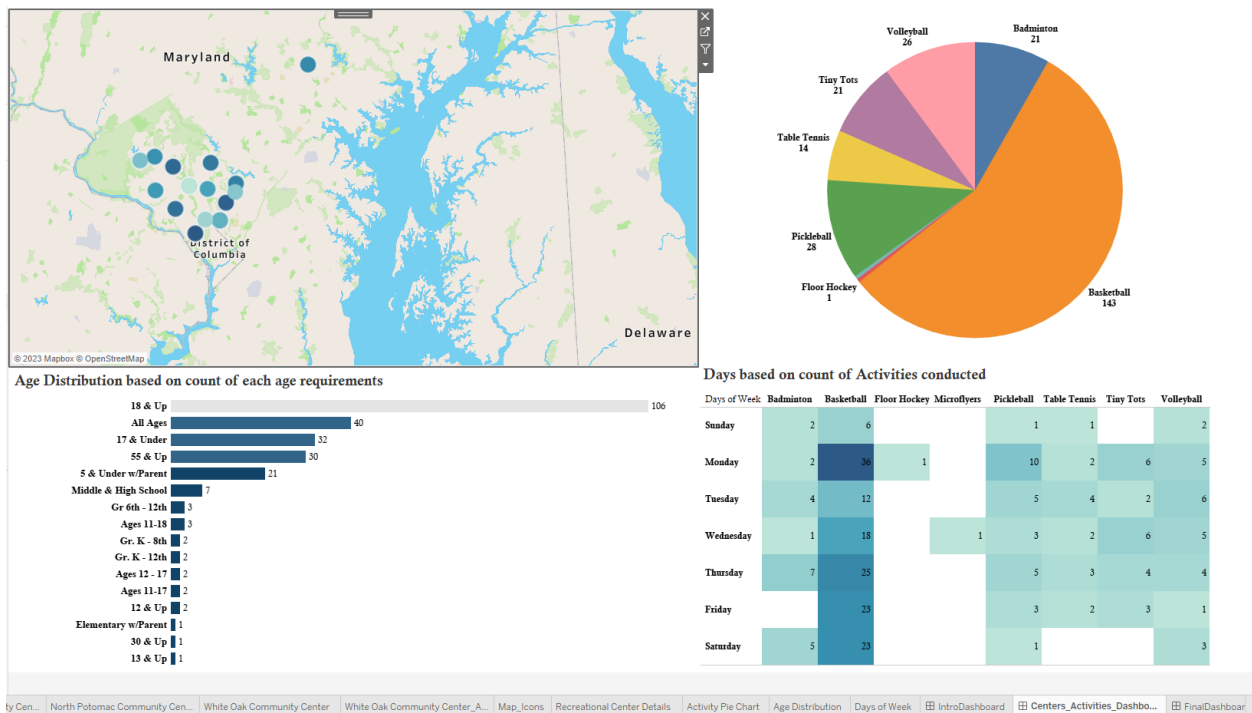
DASHBOARD: Introduction Dashboard

The recreational spring gym activities poster provides valuable insights into a variety of exercises and fun options, including badminton, basketball, floor hockey, micro flyers, pickleball, table tennis, tiny tots, and volleyball. It highlights the availability of these activities across different community centers in Pennsylvania, Wisconsin, and Maryland. The poster features 19 recreational centers offering these activities and mentions additional amenities like fitness rooms, social halls, meeting spaces, classrooms, and game rooms. Specific details about centers such as Coffield Community Center, North Potomac Community Center, and White Oak Community Center are provided, encouraging further exploration for information on activity schedules, costs, and any specific requirements. Overall, the poster emphasizes the positive aspects of engaging in recreational spring gym activities for exercise, enjoyment, and community involvement.



DASHBOARD: Recreational and Activity Dashboard

The Recreational and Activity Dashboard is a dynamic visualization tool providing a comprehensive overview of Recreational Spring Open Gym Activities. The geographical overview utilizes an interactive map and bar chart to showcase the distribution of recreational centers across states. The Recreation Center Details section employs a pie chart to highlight the frequency of activities in each center. Additionally, a bar chart illustrates age distribution based on specific age groups, and a table displays the days of the week with corresponding activity counts. The dashboard enhances understanding of activity popularity, geographic concentrations, and age preferences, fostering insightful analysis for diverse stakeholders involved in recreational planning.



Clicking on specific elements, such as a recreational center or age group, triggers a detailed information display. This interactive feature enhances user engagement and allows for a deeper exploration of the data. These visualization techniques collectively provide a comprehensive overview of recreational activities, their popularity, and key factors influencing their scheduling. The visuals serve as powerful tools for decision-makers to derive meaningful insights and make informed choices based on the data.

KEY FINDINGS AND INSIGHTS FROM THE DATASET:

- People living in the community can use visualization to find out which recreational activities are available when they happen, and if they match their interests or their children's interests.
- By looking at the chart, they can quickly see the types of activities, the busiest days, and which age groups are catered to, helping them decide where to participate.
- Recreation centers can utilize insights to optimize their program offerings, focusing on popular activities and peak days.
- They can identify specific age groups that may need more attention or tailored programs, enhancing engagement. Develop attractive programs for ages 13 & and up to increase participation.
- By understanding the geographical distribution of recreational centers, they can allocate resources and support where it is most needed.
- Introduce and promote new activities.
- Collaborate with centers, especially in regions with lower participation.

CONCLUSION:

In summary, the recreational spring gym activities dataset and visuals offer insights into the diverse exercise options at various community centers. The data highlights the variety of activities and amenities available, promoting community engagement. The user-friendly dashboards encourage exploration of specific centers and activities, contributing to a healthier and more connected community through accessible recreation.