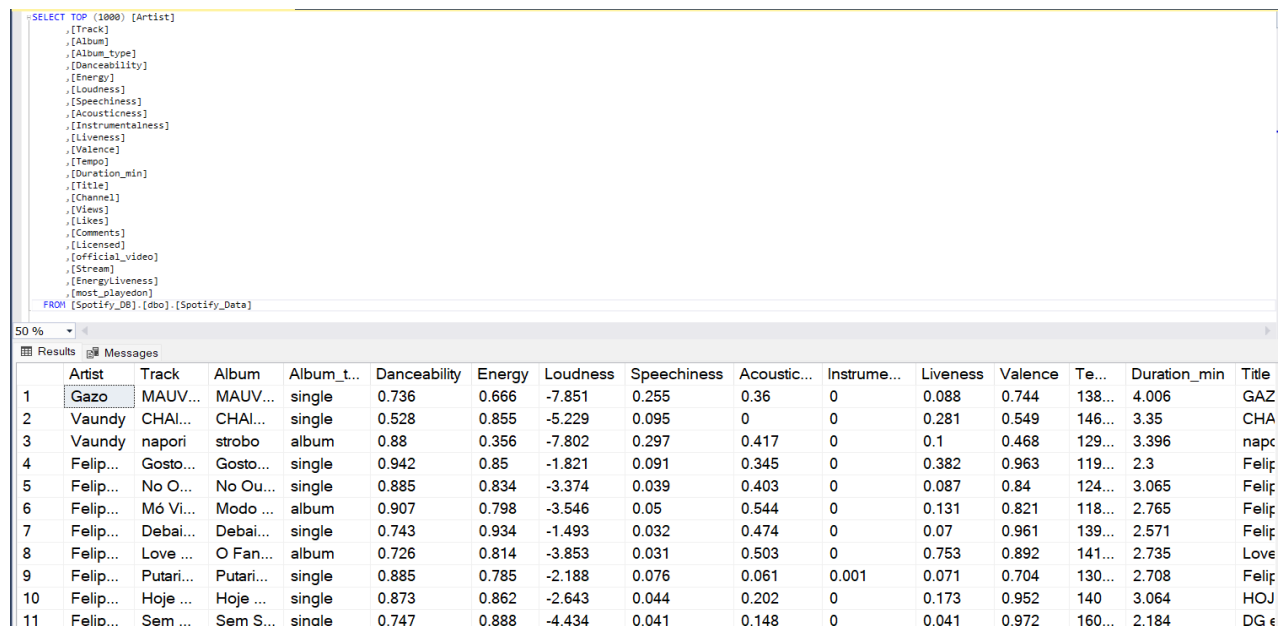


SPOTIFY ADVANCE SQL ANALYSIS

```
SELECT TOP (1000) [Artist]
, [Track]
, [Album]
, [Album_type]
, [Danceability]
, [Energy]
, [Loudness]
, [Speechiness]
, [Acousticness]
, [Instrumentalness]
, [Liveness]
, [Valence]
, [Tempo]
, [Duration_min]
, [Title]
, [Channel]
, [Views]
, [Likes]
, [Comments]
, [Licensed]
, [official_video]
, [Stream]
, [EnergyLiveness]
, [most_playedon]
FROM [Spotify_DB].[dbo].[Spotify_Dataset]
```



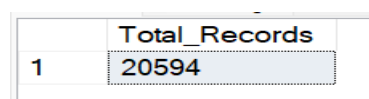
The screenshot shows a SQL query execution interface. The query is the same as the one above. The results are displayed in a table with 15 columns: Artist, Track, Album, Album_type, Danceability, Energy, Loudness, Speechiness, Acousticness, Instrumentalness, Liveness, Valence, Tempo, Duration_min, and Title. The first 11 rows of results are visible.

	Artist	Track	Album	Album_type	Danceability	Energy	Loudness	Speechiness	Acousticness	Instrumentalness	Liveness	Valence	Tempo	Duration_min	Title
1	Gazo	MAUV...	MAUV...	single	0.736	0.666	-7.851	0.255	0.36	0	0.088	0.744	138...	4.006	GAZ
2	Vaundy	CHAI...	CHAI...	single	0.528	0.855	-5.229	0.095	0	0	0.281	0.549	146...	3.35	CHA
3	Vaundy	napori	strobe	album	0.88	0.356	-7.802	0.297	0.417	0	0.1	0.468	129...	3.396	napc
4	Felip...	Gosto...	Gosto...	single	0.942	0.85	-1.821	0.091	0.345	0	0.382	0.963	119...	2.3	Felip
5	Felip...	No O...	No Ou...	single	0.885	0.834	-3.374	0.039	0.403	0	0.087	0.84	124...	3.065	Felip
6	Felip...	Mó Vi...	Modo ...	album	0.907	0.798	-3.546	0.05	0.544	0	0.131	0.821	118...	2.765	Felip
7	Felip...	Debai...	Debai...	single	0.743	0.934	-1.493	0.032	0.474	0	0.07	0.961	139...	2.571	Felip
8	Felip...	Love ...	O Fan...	album	0.726	0.814	-3.853	0.031	0.503	0	0.753	0.892	141...	2.735	Love
9	Felip...	Putari...	Putari...	single	0.885	0.785	-2.188	0.076	0.061	0.001	0.071	0.704	130...	2.708	Felip
10	Felip...	Hoje ...	Hoje ...	single	0.873	0.862	-2.643	0.044	0.202	0	0.173	0.952	140...	3.064	HOJ
11	Felip...	Sem ...	Sem S...	single	0.747	0.888	-4.434	0.041	0.148	0	0.041	0.972	160...	2.184	DG €

EXPLORATORY DATA ANALYSIS

How many records are there?

```
SELECT COUNT(*) Total_Records FROM Spotify_Data
```



The screenshot shows a SQL query execution interface. The query is the same as the one above. The results are displayed in a table with 2 columns: Total_Records and its value.

	Total_Records
1	20594

What is the Total Number of Unique Artist we have?

```
SELECT COUNT(DISTINCT Artist) Total_Numb_of_Artist FROM Spotify_Data
```

	Total_Numb_of_Artist
1	2074

What is the Total Number of Albums?

```
SELECT COUNT(DISTINCT Album) Total_Numb_of_Album FROM Spotify_Data
```

	Total_Numb_of_Album
1	11799

What are the Album type available?

```
SELECT DISTINCT Album_type FROM Spotify_Data
```

	Album_type
1	compilation
2	single
3	album

What is the Maximum and Minimum Duration of a Song?

```
SELECT
MAX(Duration_min) Max_Duration,
MIN(Duration_min) Min_Duration
From Spotify_Data
```

	Max_Duration	Min_Duration
1	77.934	0

Some songs are having 0 duration that cannot be possible so we need to get rid of those errors

```
SELECT * FROM Spotify_Data
WHERE Duration_min = 0
```

	Artist	Track	Album	Album_type	Danceability	Energy	Loud...	Spee...	Acousti...	Instrumentalness	Vale...	Tem...	Duration_min
1	Natasha Bedingfield	These...	Unwritten	album	0	0	0	0	0	0	0	0	0
2	White Noise for Ba...	Rain i...	Soothing Rain f...	album	0	0	0	0	0	0	0	0	0

So we will Delete these two records

```
DELETE FROM Spotify_Data
WHERE Duration_min = 0
```

```
SELECT * FROM Spotify_Data
WHERE Duration_min = 0
```

	Artist	Track	Album	Album_type	Danceability	Energy	Loudness	Speechiness	Acousticness	Instrumentalness	Liveness	Valence	Tempo	Duration_min	T
--	--------	-------	-------	------------	--------------	--------	----------	-------------	--------------	------------------	----------	---------	-------	--------------	---

Now How many records are there?

```
SELECT COUNT(*) Total_Records FROM Spotify_Data
```

	Total_Records
1	20592

How many channel we have?

```
SELECT COUNT(DISTINCT Channel) Number_of_Channels FROM Spotify_Data
```

Number_of_Channels
6666

What are the Platform in which we segment most popular
 SELECT DISTINCT most_playedon FROM Spotify_Data

most_playedon
Spotify
Youtube

Data Analysis Basic level

(Q1) Retrieve the names of all tracks that have more than 1 billion stream
 SELECT Track, Stream FROM Spotify_Data
 WHERE Stream > 1000000000

	Track	Stream
1	Leave The Door Open	1006100004
2	Enemy (with JID) - from the series Arcane League...	1046179886
3	Feel Good Inc.	1040234854
4	Californication	1055738398
5	Under the Bridge	1061750522
6	In Da Club	1041736808
7	Yellow	1483622308
8	Viva La Vida	1325575712
9	Something Just Like This	2030825694
10	The Scientist	1465980600
11	A Sky Full of Stars	1021782403
12	Hymn for the Weekend	1049654852
13	Fix You	1115171056
14	In the End	1444841705
15	Numb	1195213410
16	Creep	1101854725
17	Highway to Hell	1143164505
18	Thunderstruck	1088388556
19	Back in Black	1182379398
20	I Gotta Feeling	1001227038
21	Billie Jean	1302677366
22	Without Me	1457351902
23	The Real Slim Shady	1232567233
24	Till I Collapse	1548871694
25	Love The Way You Lie	1115478746

Query executed successfully. LAPTOP-MQQSV87C\SQLEXPRESS ... LAPTOP-MQQSV87C\sahil ... Spotify_DB 00:00:00 385 rows

(Q2) List all the albums with their respective artists

SELECT
 COUNT(DISTINCT Album) Total_Albums
 FROM Spotify_Data

Total_Albums
11798

Here one thing to Conclude that More than One Artist made the Album
 SELECT
 DISTINCT Album,
 Artist
 FROM Spotify_Data
 ORDER BY Album

	Album	Artist
1	[Volare! The Very Best of the Gipsy Kings	Gipsy Kings
2	"Awaken, My Love!"	Childish Gambino
3	"Heroes" (2017 Remaster)	David Bowie
4	"Let Go" DJ Pack	Dina Rae
5	"Let's Rock"	The Black Keys
6	"Miguel"	Miguel Bosé
7	#1 (Colby ODonis Remix)	Colby ODonis
8	#1s ... and then some	Brooks & Dunn
9	#3	The Script
10	#FREESANTANA	Juelz Santana
11	#NAME?	Abel Pintos
12	#NAME?	Antonio Orozco
13	#NAME?	David Bisbal
14	#NAME?	Fonseca
15	#NAME?	India Martínez
16	#NAME?	Jesse & Joy
17	#NAME?	Juanes
18	#NAME?	Laura Pausini
19	#NAME?	Pablo Alborán
20	#NAME?	Vanesa Martín
21	#SantanaWorld (+)	Young Nudy
22	#Somosmaneva	Maneva
23	#Update	Yandel
24	#willpower	will.i.am
25	#willpower (Deluxe)	will.i.am

Query executed successfully. LAPTOP-MQOSV87C\SQLEXPRESS ... LAPTOP-MQOSV87C\sahil ... Spotify_DB 00:00:00 14,176 rows

(Q3) Get the total number of comments for tracks where licensed = True
SELECT

```

FORMAT((SUM(Comments)), 'N0', 'en-US') Total_Comments
FROM Spotify_Data
WHERE Licensed = 'TRUE'

```

Total_Comments
497,015,695

(Q4) Find all the Track that belong to album type single.

```

SELECT * FROM Spotify_Data
WHERE Album_type = 'Single'

```

	Artist	Track	Album	Album_type	Danceability	Energy	Loudness	Speechiness	Acousticness	Instrumentalness	Liveness	Va
1	Gazo	MAUVAIS 2X (fe...	MAUVAIS 2X ...	single	0.736	0.666	-7.851	0.255	0.36	0	0.088	0.7
2	Vaundy	CHAINSAW BLO...	CHAINSAW B...	single	0.528	0.855	-5.229	0.095	0	0	0.281	0.5
3	Felipe Amorim	Gostosinha é Ela	Gostosinha é ...	single	0.942	0.85	-1.821	0.091	0.345	0	0.382	0.5
4	Felipe Amorim	No Ouvidinho	No Ouvidinho	single	0.885	0.834	-3.374	0.039	0.403	0	0.087	0.8
5	Felipe Amorim	Debaixo do Cob...	Debaixo do C...	single	0.743	0.934	-1.493	0.032	0.474	0	0.07	0.5
6	Felipe Amorim	Putariazinha	Putariazinha	single	0.885	0.785	-2.188	0.076	0.061	0.001	0.071	0.7
7	Felipe Amorim	Hoje Eu Vou Te ...	Hoje Eu Vou ...	single	0.873	0.862	-2.643	0.044	0.202	0	0.173	0.5
8	Felipe Amorim	Sem Sentimento	Sem Sentime...	single	0.747	0.888	-4.434	0.041	0.148	0	0.041	0.5
9	NATTAN	Tem Cabaré Ess...	Tem Cabaré ...	single	0.839	0.771	-4.673	0.114	0.591	0	0.058	0.8
10	NATTAN	P Q P	Carona no Fo...	single	0.736	0.907	-2.131	0.036	0.538	0	0.046	0.5
11	NATTAN	Diferente dos Dif...	Diferente dos ...	single	0.62	0.867	-3.847	0.036	0.334	0	0.057	0.5
12	NATTAN	Morena	Com Você ou...	single	0.625	0.834	-3.8	0.048	0.648	0	0.247	0.6
13	NATTAN	Sentada Desape...	Sentada Desa...	single	0.835	0.923	-1.831	0.057	0.243	0	0.112	0.5
14	Gurinder Gill	Excuses	Excuses	single	0.837	0.717	-7.749	0.082	0.084	0	0.149	0.4
15	Gurinder Gill	TERE TE	HIDDEN GEMS	single	0.692	0.488	-10.96	0.135	0.051	0	0.154	0.2
16	Gurinder Gill	Insane	Insane	single	0.796	0.572	-7.03	0.055	0.416	0	0.098	0.3
17	Gurinder Gill	Brown Munde	Brown Munde	single	0.854	0.611	-6.26	0.086	0.223	0	0.119	0.4
18	Gurinder Gill	DESIRE	HIDDEN GEMS	single	0.863	0.387	-10.057	0.256	0.365	0.002	0.06	0.3
19	Gurinder Gill	Faraar	Faraar	single	0.899	0.529	-8.686	0.218	0.293	0	0.091	0.2
20	Gurinder Gill	Droptop	Droptop	single	0.899	0.479	-10.432	0.272	0.013	0	0.142	0.3
21	Gurinder Gill	Majhail	Majhail	single	0.811	0.844	-4.395	0.09	0.31	0	0.731	0.8
22	Gurinder Gill	MAJHE AALE	HIDDEN GEMS	single	0.871	0.496	-9.29	0.072	0.035	0	0.074	0.2
23	Solfeggio He...	528 Hz Anxiety R...	528 Hz Transf...	single	0.328	0.069	-28.37	0.05	0.983	0.664	0.096	0.6
24	Solfeggio He...	528 Hz Love Fre...	528 Hz Transf...	single	0.159	0.098	-27.322	0.045	0.99	0.819	0.092	0.6
25	Solfeggio He...	528 Hz Release I...	528 Hz Transf...	single	0.222	0.125	-24.116	0.055	0.99	0.991	0.111	0.6

Query executed successfully. LAPTOP-MQOSV87C\SQLEXPRESS ... LAPTOP-MQOSV87C\sahil ... Spotify_DB 00:00:00 4,973 rows

(Q5) Count the Total Number of tracks by each artist
SELECT

```

    Artist,
    COUNT(Track) Total_Nr_Track
FROM Spotify_Data
GROUP BY Artist
ORDER BY
    COUNT(Track) DESC

```

	Artist	Total_Nr_Track
1	The Who	10
2	Tammi Terrell	10
3	Banda Pequeños Musical	10
4	SDM	10
5	Rick Astley	10
6	MK	10
7	Paramore	10
8	Fleetwood Mac	10
9	Bibi Blocksberg	10
10	Robbie Williams	10
11	Mika Singh	10
12	Richard Marx	10
13	The Smashing Pumpkins	10
14	Air Supply	10
15	Soprano	10
16	Romeo Santos	10
17	Gustavo Lima	10
18	Janelle Monáe	10
19	Lil Nas X	10
20	Nejo	10
21	Calle 13	10
22	IU	10
23	Carla Morrison	10
24	Chicago	10
25	Alexis y Fido	10

Query executed successfully. LAPTOP-MQSV87C\SQLEXPRESS ... LAPTOP-MQSV87C\sahil ... Spotify_DB 00:00:00 2,074 rows

Data Analysis Intermediate Level

(Q6) Calculate the Average Danceability of tracks in each album
SELECT

```

    Album,
    AVG(Danceability) Avg_Danceability
FROM Spotify_Data
GROUP BY Album
ORDER BY
    AVG(Danceability) DESC

```

	Album	Avg_Danceability
1	FOR CERTAIN (Deluxe)	0.975
2	Funky Friday	0.975
3	The House Is Burning [homies begged]	0.971
4	N9NA	0.97
5	Quality Control: Control The Streets Volume 2	0.97
6	Aka Entre el Humo	0.967
7	Peru (Remix)	0.966
8	Imdat (feat. Hadise)	0.964
9	Street Gossip	0.964
10	Tukoh Taka (Official FIFA Fan Festival™ Ant...	0.963
11	Freddies Inferno - Ghost Slowed	0.963
12	Harder Than Ever	0.963
13	Losing Interest	0.96
14	Lucky Day	0.957
15	Homework	0.956
16	DESPECHÁ RMX	0.954
17	Straight As	0.954
18	Starlight	0.954
19	Tap In	0.954
20	Ai Preto	0.953
21	Drip or Drown	0.952
22	Gaucha	0.952
23	Freewave 3	0.952
24	FAMILY	0.952

Query executed successfully. LAPTOP-MQSV87C\SQLEXPRESS ... LAPTOP-MQSV87C\sahil ... Spotify_DB 00:00:00 11,798 rows

Extra thing I noted here that There are album which have more than one track
SELECT

```

    Album,
    COUNT(Track) Number_of_Tracks
FROM Spotify_Data
GROUP BY Album
ORDER BY
    COUNT(Track) DESC

```

	Album	Number_of_Tracks
1	Greatest Hits	30
2	Hamilton (Original Broadway Cast Recording)	29
3	Rebelde	25
4	El Último Adiós	24
5	Madvillainy	24
6	HEROES & VILLAINS	22
7	An Evening With Silk Sonic	20
8	Vida Cara	20
9	Nuestro Amor	20
10	Color Esperanza 2020	19
11	Tchaikovsky: The Nutcracker	18
12	RODZINNY BIZNES	17
13	Only Built For Infinity Links	15
14	The Score (Expanded Edition)	15
15	Gladiator - Music From The Motion Picture	14
16	Resistire	14
17	MANSION MUSIK	13
18	The Heist	13
19	IL CORAGGIO DEI BAMBINI	12
20	Die 30 besten Schlaflieder für Kinder	12
21	Un Verano Sin Ti	12
22	LITTLE LOVE	12
23	SOS	11
24	...	11

Query executed successfully. | LAPTOP-MQQSV87C\SQLEXPRESS ... | LAPTOP-MQQSV87C\sahil ... | Spotify_DB | 00:00:00 | 11,798 rows

(Q7) Find the Top 5 Tracks with highest energy values

```

SELECT TOP 5
    Track,
    MAX(Energy) Max_Energy
FROM Spotify_Data
GROUP BY Track
ORDER BY
    MAX(Energy) DESC

```

Track	Max_Energy
Gentle Piano Melodies	1
Rain and Thunderstorm, Pt. 3	1
Rain and Thunderstorm, Pt. 33	1
Rain and Thunderstorm, Pt. 4	1
Rain and Thunderstorm, Pt. 6	1

(Q8) List all tracks along with views and likes where official_video = True

```

SELECT Track,
    SUM(Views) Total_Views,
    SUM(Likes) Total_Likes
FROM Spotify_Data
WHERE official_video = 'TRUE'
GROUP BY Track
ORDER BY
    SUM(Views) DESC

```

	Track	Total_Views	Total_Likes
1	Despacito	16159296273	101577278
2	See You Again (feat. Charlie Puth)	11547595554	80295292
3	Shape of You	5908398479	31047780
4	Calma - Remix	5322011392	25649519
5	This Is What You Came For	5252059812	21207312
6	Swalla (feat. Nicki Minaj & Ty Dolla Sign)	5162403752	28864162
7	Wheels on the Bus	4898831101	14396841
8	Taki Taki (with Selena Gomez, Ozuna & Cardi B)	4828403435	37552053
9	Uptown Funk (feat. Bruno Mars)	4821016218	20067879
10	Thrift Shop (feat. Wanz)	4508467245	30242165
11	Échame La Culpa	4491334603	20006575
12	Something Just Like This	4236043204	20565056
13	Sin Pijama	4172961620	17249780
14	Somebody That I Used To Know	4114890942	29168472
15	Con Altura	4093098189	18536081
16	Perfect	4080224385	24814514
17	Bang Bang	4002768766	22355292
18	No Me Conoce - Remix	3958118245	11841081
19	Sunflower - Spider-Man: Into the Spider-Verse	3954778068	27499619
20	Sugar	3947319650	16146579
21	Dusk Till Dawn (feat. Sia) - Radio Edit	3907550097	28299420
22	Bole Chudiyan	3817613826	17771858
23	Roar	3775748519	15864499

Query executed successfully. LAPTOP-MQOSV87C\SQLEXPRESS ... LAPTOP-MQOSV87C\sahil ... Spotify_DB 00:00:00 13,532 rows

(Q9) For each album, Calculate the total views of all tracks

```
SELECT
    ALBUM,
    Track,
    SUM(Views) Total_Views
FROM Spotify_Data
GROUP BY Track,Album
ORDER BY
    SUM(Views) DESC
```

	ALBUM	Track	Total_Views
1	VIDA	Despacito	16159296273
2	See You Again (feat. Charlie Puth)	See You Again (feat. Charlie Puth)	11547595554
3	Peace Is The Mission (Extended)	Lean On	9974504694
4	÷ (Deluxe)	Shape of You	5908398479
5	MUNAY	Calma - Remix	5322011392
6	This Is What You Came For	This Is What You Came For	5252059812
7	Swalla (feat. Nicki Minaj & Ty Dolla Sign)	Swalla (feat. Nicki Minaj & Ty Dolla Sign)	5162403752
8	CoComelon Kids Hits, Vol. 1	Wheels on the Bus	4898831101
9	Taki Taki (with Selena Gomez, Ozuna ...	Taki Taki (with Selena Gomez, Ozuna...	4828403435
10	Uptown Special	Uptown Funk (feat. Bruno Mars)	4821016218
11	Gangnam Style (?????)	Gangnam Style (?????)	4679767471
12	The Heist	Thrift Shop (feat. Wanz)	4508467245
13	VIDA	Échame La Culpa	4491334603
14	Memories...Do Not Open	Something Just Like This	4236043204
15	MALA SANTA	Sin Pijama	4172961620
16	Making Mirrors	Somebody That I Used To Know	4114431870
17	Con Altura	Con Altura	4093098189
18	Famouz	No Me Conoce - Remix	3958118245
19	Hollywoods Bleeding	Sunflower - Spider-Man: Into the Spid...	3954778068
20	Icarus Falls	Dusk Till Dawn (feat. Sia) - Radio Edit	3907550097
21	V	Sugar	3817733132

Query executed successfully. LAPTOP-MQOSV87C\SQLEXPRESS ... LAPTOP-MQOSV87C\sahil ... Spotify_DB 00:00:00 18,666 rows

(Q10) Retrieve the Track names that have been streamed on Spotify more than Youtube

```
SELECT
    Track,
    SUM(CASE WHEN most_playedon = 'Youtube' THEN Stream END) Stream_on_youtube,
    SUM(CASE WHEN most_playedon = 'Spotify' THEN Stream END) Stream_on_Spotify
FROM Spotify_Data
GROUP BY Track
```

	Track	Stream_on_youtube	Stream_on_Spotify
1	!ly (feat. Coez)	NULL	52628204
2	#1 - Colby ODonis Remix	561794	NULL
3	#3	NULL	45002482
4	#41	NULL	34528391
5	#NAME?	151740161	35711591
6	#thatPOWER	220604728	NULL
7	#Ysya2020 Vol. 5 - Silbando	NULL	26297019
8	&burn (with Vince Staples)	NULL	208847367
9	(Dont Fear) The Reaper	21305089	441277003
10	(Everything I Do) I Do It For You	NULL	464434163
11	(Ghost) Riders in the Sky	NULL	88417035
12	(Ghost) Riders in the Sky - Liv...	17506408	NULL
13	(God Must Have Spent) A Littl...	NULL	43506262
14	(I Cant Get No) Satisfaction - ...	NULL	561632246
15	(I Cant Help) Falling In Love ...	NULL	180935269
16	(I Left My Heart) In San Franci...	NULL	44798744
17	(It Looks Like) Ill Never Fall In ...	NULL	17505008
18	(Just Like) Starting Over - Re...	NULL	49708785
19	(Po)ci?g dalszy nast?pi	17240146	NULL
20	(Rock) Superstar (feat. Chino ...	NULL	69035819
21	(Shake, Shake, Shake) Shake...	NULL	47486504
22	(Sittin On) the Dock of the Bay	NULL	515616223
23	(Theres No Place Like) Home...	NULL	77965317
24	(They Long To Be) Close To ...	NULL	139409141
25	(Today I Met) The Boy Im Go...	NULL	16964783

Query executed successfully. LAPTOP-MQOSV87C\SQLEXPRESS ... LAPTOP-MQOSV87C\sahil ... Spotify_DB 00:00:00 17,544 rows

We can Notice that Most of the songs are not streamed on both the platform

```

SELECT * FROM
(SELECT
    Track,
    COALESCE(SUM(CASE WHEN most_playedon = 'Youtube' THEN Stream END),0)
Stream_on_youtube,
    COALESCE(SUM(CASE WHEN most_playedon = 'Spotify' THEN Stream END),0)
Stream_on_Spotify
FROM Spotify_Data
GROUP BY Track) AS T1
WHERE
    Stream_on_Spotify > Stream_on_youtube
AND
    Stream_on_youtube <> 0
ORDER BY Stream_on_Spotify DESC

```

	Track	Stream_on_youtube	Stream_on_Spotify
1	Old Town Road - Remix	66118224	2787806910
2	Silence	22259505	2644114398
3	Photograph	144604914	2369780169
4	Stay	933966110	2197528484
5	Perfect Strangers	101011043	1830998400
6	Without Me	1457351902	1666992690
7	Demons	84840590	1643098973
8	Color Esperanza 2020	89466323	1610393814
9	Radioactive	73259995	1500460111
10	Be Alright	15863427	1411301562
11	Paris	63117196	1393488738
12	FOREVER	53994510	1300096678
13	Stronger	71959681	1257139180
14	Deja Vu	329745393	1212242152
15	Woman	78530465	1163854443
16	Mercy	196048808	1112788942
17	Stand by Me	22160956	1021424033
18	Have You Ever Seen ...	61903001	975300588
19	Unstoppable	10626164	966825739
20	Heaven	472074634	963919240
21	Rise	244556803	909522444
22	Human	773849349	888743346
23	Say My Name	526948090	860383844
24	Without You	194107435	858203271
25	Beast Animation #6: E...	211124091	844705026

Query executed successfully. LAPTOP-MQOSV87C\SQLEXPRESS ... LAPTOP-MQOSV87C\sahil ... Spotify_DB 00:00:00 186 rows

Data Analysis Advance Level

(Q11) Find Top 3 most viewed tracks for each artist using window functions
-> First we will find Each Artist and Total view for each Track
-> Second Track with Highest View for each Artist(We need Top3)

-> Third use Dense Rank function and CTE

```
WITH Ranking_Artist
AS(
SELECT
    Artist,
    Track,
    SUM(Views) Total_Views,
    DENSE_RANK() OVER(PARTITION BY Artist ORDER BY SUM(Views) DESC) Rank
FROM Spotify_Data
GROUP BY Artist,Track
)
SELECT * FROM Ranking_Artist
WHERE Rank<=3
```

	Artist	Track	Total_Views	Rank
1	SNOT	Tell Em	41100657	1
2	SNOT	Like Me (feat. iann dior)	15803517	2
3	SNOT	Mean	13563870	3
4	Suicideboy\$	Paris	175156959	1
5	Suicideboy\$	For the Last Time	91771038	2
6	Suicideboy\$	Kill Yourself (Part III)	31674988	3
7	(G)I-DLE	POP/STARS	541864471	1
8	(G)I-DLE	TOMBOY	204797335	2
9	(G)I-DLE	Oh my god	191587399	3
10	*NSYNC	Bye Bye Bye	315874581	1
11	*NSYNC	This I Promise You	252377383	2
12	*NSYNC	Its Gonna Be Me	172368673	3
13	070 Shake	Escapism.	25149399	1
14	070 Shake	Escapism. - Slowed ...	25149399	1
15	070 Shake	Escapism. - Sped Up	25149399	1
16	070 Shake	Guilty Conscience	10148280	2
17	070 Shake	Morrow	2815446	3
18	11:11 Mus...	hola como tale tale v...	9509592	1
19	11:11 Mus...	after dark x sweater w...	1566827	2
20	11:11 Mus...	stargirl interlude (spe...	1005798	3
21	112	Only You (feat. The N...	76971300	1
22	112	Peaches & Cream	28261569	2
23	112	Peaches & Cream (fe...	28261569	2
24	112	Cupid	20597417	3
25	1nonly	Stay With Me	40195398	1

(Q12) Write a Query to find Tracks where the liveness is above Average

```
SELECT
    Track,
    Artist,
    Liveness
FROM Spotify_Data
WHERE Liveness> (SELECT AVG(Liveness) FROM Spotify_Data)
ORDER BY Liveness DESC
```

	Track	Artist	Liveness
1	Me Quedo Contigo (Si Me Das A Elegir) - Live Bai...	Manu Chao	1
2	El Próximo Viernes - Live Version	Thalia	0.997
3	À Sua Maneira (De Música Ligera) - Ao Vivo	Capital Inicial	0.99
4	Eu Vou Estar - Ao Vivo	Capital Inicial	0.986
5	Natasha - Ao Vivo	Capital Inicial	0.984
6	Anunciação - Ao Vivo	Alceu Valença	0.984
7	Okie From Muskogee - Live	Alabama	0.984
8	Leave The Door Open - Live	Silk Sonic	0.984
9	Tan Sólo Tú (feat. Alejandra Guzmán) - Franco De ...	Franco De Vita	0.984
10	Okie From Muskogee - Live	Sheryl Crow	0.984
11	Okie From Muskogee - Live	Hank Williams, Jr.	0.984
12	Sabá - Ao Vivo	Zé Ramalho	0.983
13	Stairway to Heaven (Live At The Kennedy Center ...	Heart	0.983
14	Supera - Ao Vivo	Pérciles	0.983
15	Sabá - Ao Vivo	Alceu Valença	0.983
16	Até O Fim - Ao Vivo	Engenheiros D...	0.983
17	Cobertor de Orelha - Ao Vivo	Turma do Pago...	0.982
18	São Gonça	Seu Jorge	0.982
19	Te Pienso Sin Querer (feat. Gloria Trevi) - Vuelve e...	Franco De Vita	0.98
20	Independência - Ao Vivo	Capital Inicial	0.98
21	Los Luchadores	La Sonora Sant...	0.978
22	You Learn - Live / Unplugged	Alanis Morissette	0.978
23	Nota de Repúdio - Ao Vivo	Gustavo Lima	0.977
24	Eu Quero Recair - Ao Vivo	Simone & Sima...	0.977
25	Tarada - Ao Vivo	Ivete Sangalo	0.977

(Q13) Use a with Clause to calculate the difference between the Highest and lowest energy values for tracks in each album

WITH Energy_of_Album AS

(

SELECT

Album,
MAX(Energy) Highest_Energy,
MIN(Energy) Lowest_Energy
FROM Spotify_Data

GROUP BY Album

)

SELECT Album, Highest_Energy - Lowest_Energy as Energy_difference

FROM Energy_of_Album

ORDER BY 2 DESC

	Album	Energy_difference
1	White Noise	0.907
2	Spotify Singles - Holiday	0.836
3	Spotify Singles	0.823
4	UNDERTALE Soundtrack	0.816
5	Making Mirrors	0.811
6	Everytime We Touch (Premium Edition)	0.805
7	If I Can Dream: Elvis Presley with the Royal Phi...	0.787
8	Fallen	0.765
9	CeeLos Magic Moment	0.762
10	Greatest Hits	0.741
11	Safe Haven	0.738
12	Pain Killer	0.734
13	Paranoid (Remaster)	0.732
14	Nevermind (Remastered)	0.711
15	Texas Flood (Legacy Edition)	0.703
16	American Heartbreak	0.697
17	For Lovers	0.689
18	Immortalized (Deluxe Edition)	0.687
19	Storytelling	0.686
20	A Brief Inquiry Into Online Relationships	0.682
21	Baar Baar Dekho (Original Motion Picture Sou...	0.68
22	Sweet Caroline	0.673
23	Scars & Stories	0.672
24	INSIDE	0.671
25	Bridge Over Troubled Water	0.67

(Q14) Find tracks where the energy-to-liveness ratio is greater than 1.2.

SELECT

Track,
EnergyLiveness FROM Spotify_Data

WHERE EnergyLiveness > 1.2

ORDER BY

EnergyLiveness DESC

	Track	EnergyLiveness
1	Take It	59.11392405
2	Verano Azul	58
3	Salvavidas	57.65517241
4	Ants Marching	54.52229299
5	Eres Mi Sueño - Versión Radio Edit	51.38121547
6	Feel My Needs - Purple Disco Machine Remix	49.23076923
7	Bonetrousle	48.9
8	Dominicana	45.52763819
9	Socadona (feat. Mr. Vegas)	43.77659574
10	Aint It Fun	42.52380952
11	Mal Bicho - Remasterizado 2008	41.73333333
12	Psychosocial	40.37037037
13	CASE 143	40.09090909
14	Finesse - Remix; feat. Cardi B	39.95348837
15	Daydreamin	39.64912281
16	Hollaback Girl	39.14529915
17	The Loco-Motion	38.93617021
18	No Sigue Modas Aka Ella No Sigue Modas	38.65470852
19	No Voy en Tren	38.47457627
20	Yamz	38.36842105
21	Middle of the Road - 2007 Remaster	38.36
22	SNEAKERS	38.07174888
23	Boom, Boom, Boom, Boom!!	37.92
24	B.O.B. - Bombs Over Baghdad	37.61538462
25	Hard Times	37.35159817

(Q15) Calculate the cumulative sum of likes for tracks ordered by the number of views, using window functions.

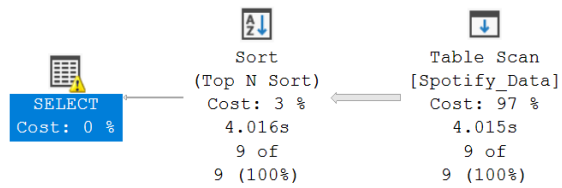
```
SELECT
    Track,
    SUM(TotalLikes) OVER (ORDER BY TotalViews DESC) AS CumulativeLikes
FROM (
    SELECT
        Track,
        SUM(Views) AS TotalViews,
        SUM(likes) AS TotalLikes
    FROM Spotify_Data
    GROUP BY Track
) t3
ORDER BY TotalViews DESC;
```

	Track	CumulativeLikes
1	Despacito	101577278
2	See You Again (feat. Charlie Puth)	181872570
3	Lean On	230505776
4	Shape of You	261553556
5	Calma - Remix	287203075
6	This Is What You Came For	308410387
7	Swalla (feat. Nicki Minaj & Ty Dolla \$ign)	337274549
8	Wheels On The Bus	351673534
9	Taki Taki (with Selena Gomez, Ozuna & Cardi B)	389225587
10	Uptown Funk (feat. Bruno Mars)	409293466
11	Gangnam Style (?????)	435692599
12	Thrift Shop (feat. Wanz)	465934764
13	Échame La Culpa	485941339
14	Something Just Like This	506506395
15	Sin Pijama	523756175
16	Somebody That I Used To Know	552924647
17	Con Altura	571460728
18	Perfect	596275611
19	Bang Bang	618630903
20	No Me Conoce - Remix	630471984
21	Sunflower - Spider-Man: Into the Spider-Verse	657971603
22	Sugar	674118182
23	Dusk Till Dawn (feat. Sia) - Radio Edit	702417602
24	Bole Chudiyan	720189460
25	Roar	736053959

Query Optimizations

```
SELECT
    TOP 25
    Artist,
    Track,
    Views
FROM Spotify_Data
WHERE
    Artist = 'Gorillaz'
    AND
    Most_playedon = 'Spotify'
ORDER BY
    stream DESC
```

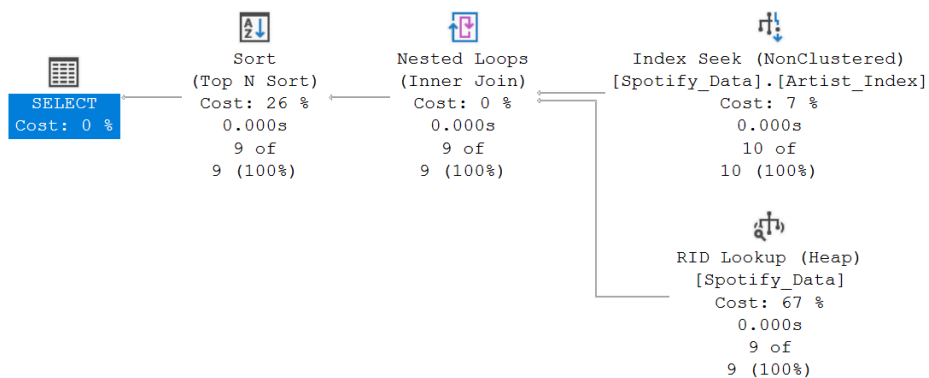
Query 1: Query cost (relative to the batch): 100%
 SELECT TOP 25 Artist, Track, Views FROM Spotify_Data WHERE Artist ='Gorillaz' AND Most_playedon = 'Spotify' ORDER BY stream DESC



```

CREATE INDEX Artist_Index ON Spotify_Data (Artist)
-- Ran query after creating Index
SELECT
  TOP 25
  Artist,
  Track,
  Views
FROM Spotify_Data
WHERE
  Artist ='Gorillaz'
  AND
  Most_playedon = 'Spotify'
ORDER BY
  stream DESC
  
```

Query 1: Query cost (relative to the batch): 100%
 SELECT TOP 25 Artist, Track, Views FROM Spotify_Data WHERE Artist ='Gorillaz' AND Most_playedon = 'Spotify' ORDER BY stream DESC



By this way we can optimize performance of Queries