AIRLINES SATISFACTION SYSTEM THROUGH TWITTER REVIEW'S SENTIMENT ANALYSIS

TWITTER BOT PYTHON FILE - JUPYTER

https://drive.google.com/file/d/1nttw2K_weFK2RqZPXC__e1pZElZdk_hE/view?usp=sharing

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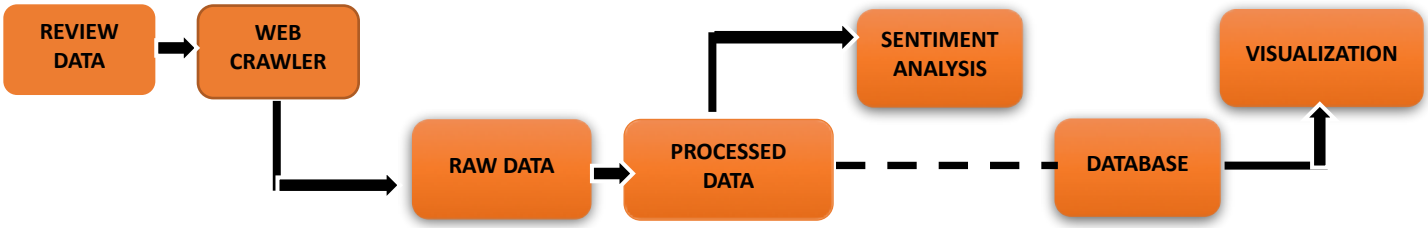
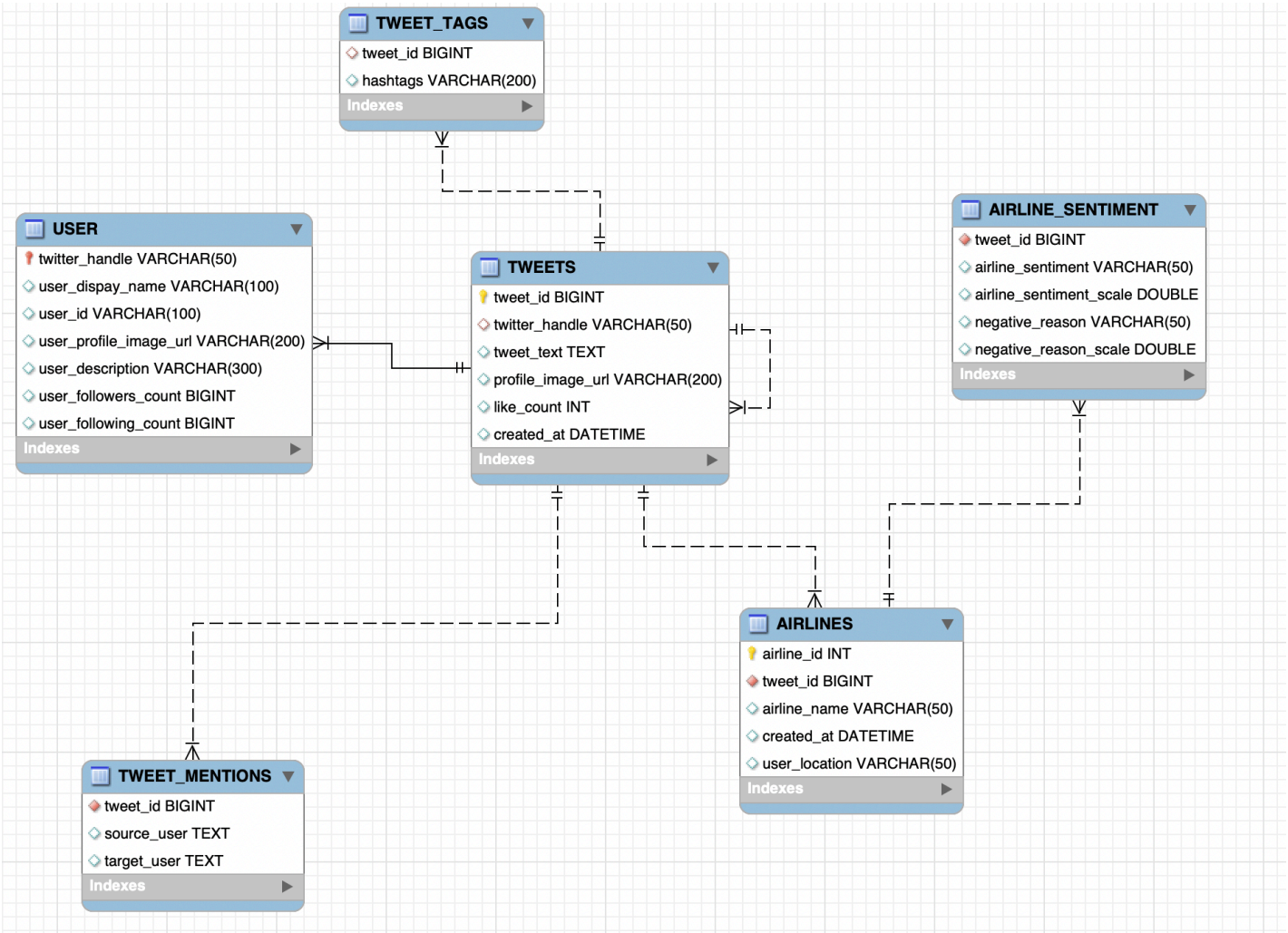
CONCEPTUAL FLOW DIAGRAM



ER DIAGRAM



TABLES POPULATED

USERS

```
1 • SELECT * FROM airline_passenger_satisfaction.USER;
```

100% 51:1

Result Grid Filter Rows: Search Edit: Export/Import: Fetch rows:

twitter_handle	name	profile_image_url	description	followers_cou...	following_co...
1346039126324346882	InfoAboutMayday	https://pbs.twimg.com/profile_images/12555859…	Info searcher for TV Documentary Mayday/Air C…	378	21
1346115171165626370	MzNyonjo	https://pbs.twimg.com/profile_images/15815944…	I make ££££ just so I can spend it on living life,…	455	442
1346117908569628676	faisalsyed22001	https://abs.twimg.com/sticky/default_profile_ima…	Faisal	1	2
1346146336576581632	Samjamben28	https://pbs.twimg.com/profile_images/12946019…		39	139
1346191427869560839	lorrainemking	https://pbs.twimg.com/profile_images/1553907908458463233/3YVNgWa7_normal.jpg	ector who is…	14871	4479
1346239841885966336	win_and_fly	https://pbs.twimg.com/profile_images/10246647…	Passionate for aviation and flying around the wo…	162	880
1346294300896739329	buss80696441	https://abs.twimg.com/sticky/default_profile_ima…		0	12
1346454748740767755	baolau	https://pbs.twimg.com/profile_images/11644774…	Information and ticket booking service to travel…	769	86
1346504962667388940	Forthemanynott5	https://pbs.twimg.com/profile_images/15545230…	18 years old Criminology Politics and sociology…	3015	5003
1346748353292460033	lcap_io	https://pbs.twimg.com/profile_images/10436425…		2496	610
1346773623860826112	Daniel97993490	https://pbs.twimg.com/profile_images/14225404…	I am seeking justice. Let's help eachother, let's l…	25	161
1346841941133164546	British_Airways	https://pbs.twimg.com/profile_images/15725700…	Official British Airways Twitter account. We love…	1433994	95166
1347103231684583426	manstol1	https://pbs.twimg.com/profile_images/10899187…	Boxing. Travel. George Michael. Sarcasm. Politi…	190	619
1347209685783486465	British_Airways	https://pbs.twimg.com/profile_images/15725700…	Official British Airways Twitter account. We love…	1433994	95166
1347465085921472512	Agulhas5	https://pbs.twimg.com/profile_images/15214867…	here i am.	20	70
1347488011903123458	Anshuag1211	https://pbs.twimg.com/profile_images/12366407…	Programme Manager	7	24
1347581371401830400	advicedotscot	https://pbs.twimg.com/profile_images/12130292…	Telephone and web-based advice for the people…	2760	1839
1347646827223543814	mrgarycole	https://pbs.twimg.com/profile_images/14972088…	Fcuk russia. Fcuk Putin and fcuk the west for no…	397	503
1347893401132396548	lcap_io	https://pbs.twimg.com/profile_images/10436425…		2496	610
1348452395777449984	ElleJaye3	https://pbs.twimg.com/profile_images/11192664…	First listen to understand then respond.	68	61
1349155397932732416	julianasuprstar	https://pbs.twimg.com/profile_images/13879531…	Daughter Mother Sister Friend Warrior Lover of…	195	1081
1349305747360915456	Samjamben28	https://pbs.twimg.com/profile_images/12946019…		39	139
1349319605798449152	British_Airways	https://pbs.twimg.com/profile_images/15725700…	Official British Airways Twitter account. We love…	1433994	95166
1350104515673018373	LeoKellerOT	https://pbs.twimg.com/profile_images/14514144…	LD occupational therapist working and living in…	632	281
1350301552981008386	farhanme253	https://pbs.twimg.com/profile_images/15129808…		23	130
1350455328593338371	JanetSEdwards61	https://pbs.twimg.com/profile_images/66124895…	Try to be on Schedule	453	1443

TWEETS

```
1 • SELECT * FROM airline_passenger_satisfaction.TWEETS;
```

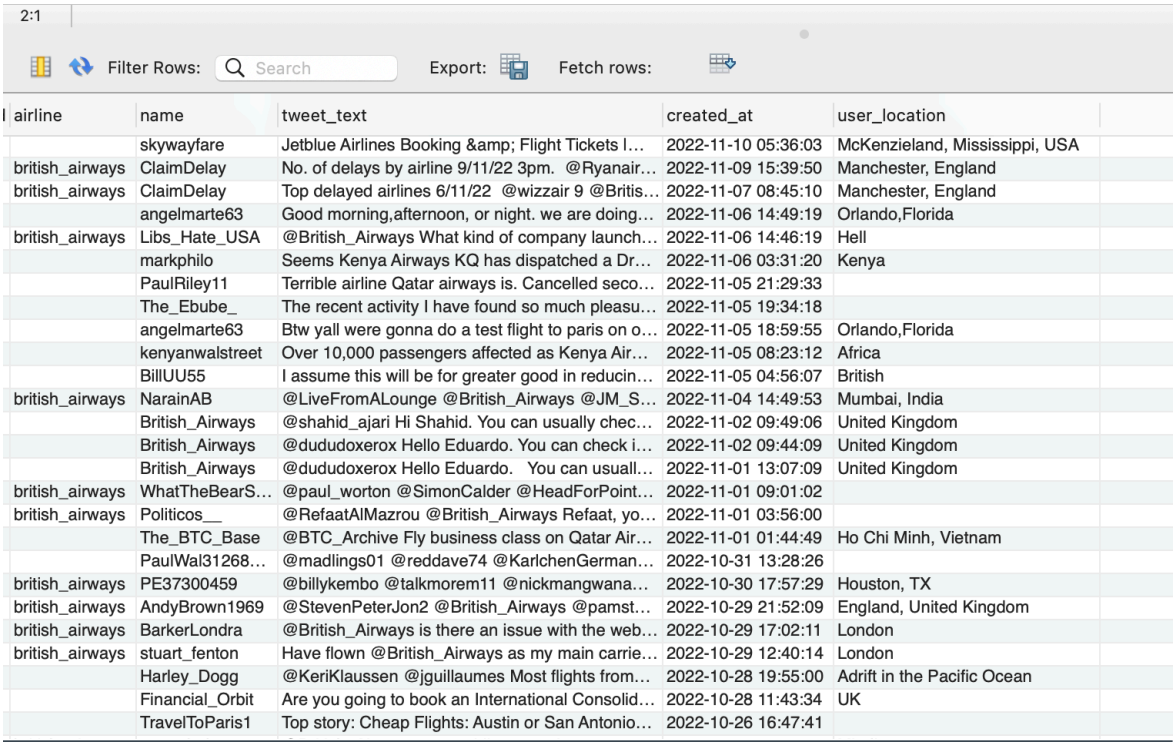
100% 1:1

Result Grid Filter Rows: Search Edit: Export/Import: Fetch rows:

tweet_id	twitter_handle	tweet_text	profile_image_url	like_count	created_at
3	1591070011816579072	@British_Airways @easyJet @KLM @airfrance…	https://pbs.twimg.com/profile_images/10648326…	1	2022-11-11 14:07:06
4	1590726567160090624	It's easier to book tickets for #peterkay than it is…	https://pbs.twimg.com/profile_images/10623033…	0	2022-11-10 15:22:22
5	1590579016565919750	Jetblue Airlines Booking & Flight Tickets I…	https://pbs.twimg.com/profile_images/15703385…	0	2022-11-10 05:36:03
6	1590368573897469954	No. of delays by airline 9/11/22 3pm. @Ryanair…	https://pbs.twimg.com/profile_images/10623033…	0	2022-11-09 15:39:50
7	1589539443371020288	Top delayed airlines 6/11/22 @wizzair 9 @Britis…	https://pbs.twimg.com/profile_images/10623033…	0	2022-11-07 08:45:10
8	1589268697046077441	Good morning,afternoon, or night. we are doing…	https://pbs.twimg.com/profile_images/15913325…	2	2022-11-06 14:49:19
9	1589267942780579840	@British_Airways What kind of company launch…	https://pbs.twimg.com/profile_images/13730597…	0	2022-11-06 14:46:19
10	1589098076630790144	Seems Kenya Airways KQ has dispatched a Dr…	https://pbs.twimg.com/profile_images/15609432…	3	2022-11-06 03:31:20
11	1589007031360696320	Terrible airline Qatar airways is. Cancelled seco…	https://abs.twimg.com/sticky/default_profile_ima…	0	2022-11-05 21:29:33
12	1588978028771962880	The recent activity I have found so much pleasu…	https://pbs.twimg.com/profile_images/15744414…	0	2022-11-05 19:34:18
13	1588969376895467520	Btw yall were gonna do a test flight to paris on o…	https://pbs.twimg.com/profile_images/15913325…	2	2022-11-05 18:59:55
14	1588809139186114560	Over 10,000 passengers affected as Kenya Air…	https://pbs.twimg.com/profile_images/10930224…	17	2022-11-05 08:23:12
15	1588757025420619776	I assume this will be for greater good in reducin…	https://abs.twimg.com/sticky/default_profile_ima…	0	2022-11-05 04:56:07
16	1588544065465114625	@LiveFromALounge @British_Airways @JM_S…	https://pbs.twimg.com/profile_images/11194747…	0	2022-11-04 14:49:53
17	1587743596651970561	@shahid_ajari Hi Shahid. You can usually chec…	https://pbs.twimg.com/profile_images/15725700…	0	2022-11-02 09:49:06
18	1587742348682969088	@dududoxerox Hello Eduardo. You can check i…	https://pbs.twimg.com/profile_images/15725700…	1	2022-11-02 09:44:09
19	1587431049801375744	@dududoxerox Hello Eduardo. You can usuall…	https://pbs.twimg.com/profile_images/15725700…	1	2022-11-01 13:07:09
20	1587369108638765056	@paul_worton @SimonCalder @HeadForPoint…	https://pbs.twimg.com/profile_images/77325065…	0	2022-11-01 09:01:02
21	1587292345321619458	@RefaatAlMazrou @British_Airways Refaat, yo…	https://pbs.twimg.com/profile_images/83510190…	0	2022-11-01 03:56:00
22	1587259332915523585	@BTC_Archive Fly business class on Qatar Air…	https://pbs.twimg.com/profile_images/15405150…	0	2022-11-01 01:44:49
23	1587074015272861696	@madlings01 @reddave74 @KarlchenGerman…	https://pbs.twimg.com/profile_images/14838337…	2	2022-10-31 13:28:26
24	1586779335750725633	@billykembo @talkmorem11 @nickmangwana…	https://pbs.twimg.com/profile_images/13386666…	0	2022-10-30 17:57:29
25	1586476005262516224	@StevenPeterJon2 @British_Airways @pamst…	https://pbs.twimg.com/profile_images/14051992…	0	2022-10-29 21:52:09
26	1586403032677306369	@British_Airways is there an issue with the web…	https://pbs.twimg.com/profile_images/45052661…	0	2022-10-29 17:02:11
27	1586337111757627392	Have flown @British_Airways as my main carrie…	https://pbs.twimg.com/profile_images/14990422…	0	2022-10-29 12:40:14
28	1586084137252753408	@KeriKlaussen @iguillaumes Most flights from…	https://pbs.twimg.com/profile_images/14735159…	1	2022-10-28 19:55:00

AIRLINES

```
SELECT * FROM airline_passenger_satisfaction.AIRLINES;
```



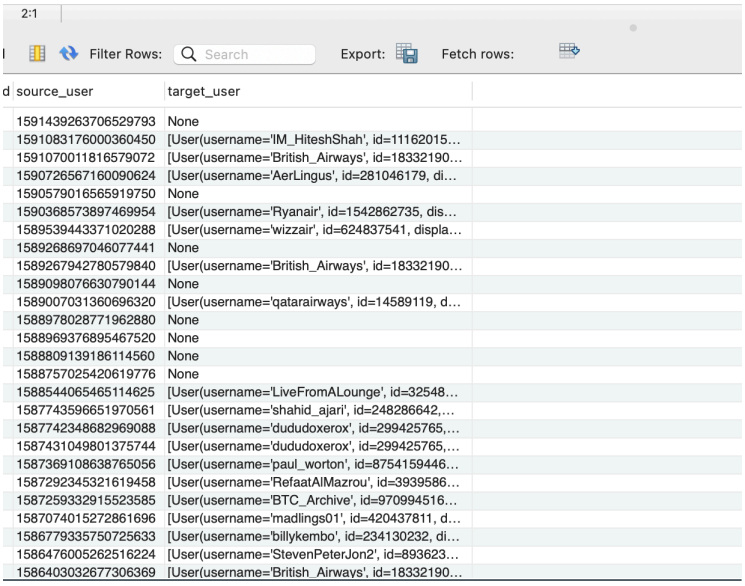
2:1

Filter Rows: Search Export: Fetch rows:

airline	name	tweet_text	created_at	user_location
	skywayfare	Jetblue Airlines Booking & Flight Tickets I…	2022-11-10 05:36:03	McKenzieland, Mississippi, USA
british_airways	ClaimDelay	No. of delays by airline 9/11/22 3pm. @Ryanair…	2022-11-09 15:39:50	Manchester, England
british_airways	ClaimDelay	Top delayed airlines 6/11/22 @wizzair 9 @Britis…	2022-11-07 08:45:10	Manchester, England
	angelmarte63	Good morning,afternoon, or night. we are doing…	2022-11-06 14:49:19	Orlando,Florida
british_airways	Libs_Hate_USA	@British_Airways What kind of company launch…	2022-11-06 14:46:19	Hell
	markphilo	Seems Kenya Airways KQ has dispatched a Dr…	2022-11-06 03:31:20	Kenya
	PaulRiley11	Terrible airline Qatar airways is. Cancelled seco…	2022-11-05 21:29:33	
	The_Ebube_	The recent activity I have found so much pleasu…	2022-11-05 19:34:18	
	angelmarte63	Btw yall were gonna do a test flight to paris on o…	2022-11-05 18:59:55	Orlando,Florida
	kenyanwalstreet	Over 10,000 passengers affected as Kenya Air…	2022-11-05 08:23:12	Africa
	BillUU55	I assume this will be for greater good in reducin…	2022-11-05 04:56:07	British
british_airways	NarainAB	@LiveFromALounge @British_Airways @JM_S…	2022-11-04 14:49:53	Mumbai, India
	British_Airways	@shahid_ajari Hi Shahid. You can usually chec…	2022-11-02 09:49:06	United Kingdom
	British_Airways	@dududoxerox Hello Eduardo. You can check i…	2022-11-02 09:44:09	United Kingdom
	British_Airways	@dududoxerox Hello Eduardo. You can usuall…	2022-11-01 13:07:09	United Kingdom
british_airways	WhatTheBearS…	@paul_worton @SimonCalder @HeadForPoint…	2022-11-01 09:01:02	
british_airways	Politicos__	@RefaatAlMazrou @British_Airways Refaat, yo…	2022-11-01 03:56:00	
	The_BTC_Base	@BTC_Archive Fly business class on Qatar Air…	2022-11-01 01:44:49	Ho Chi Minh, Vietnam
	PaulWal31268…	@madlings01 @reddave74 @KarlchenGerman…	2022-10-31 13:28:26	
british_airways	PE37300459	@billykembo @talkmorem11 @nickmangwana…	2022-10-30 17:57:29	Houston, TX
british_airways	AndyBrown1969	@StevenPeterJon2 @British_Airways @pamst…	2022-10-29 21:52:09	England, United Kingdom
british_airways	BarkerLondra	@British_Airways is there an issue with the web…	2022-10-29 17:02:11	London
british_airways	stuart_fenton	Have flown @British_Airways as my main carrie…	2022-10-29 12:40:14	London
	Harley_Dogg	@KeriKlaussen @jguillaumes Most flights from…	2022-10-28 19:55:00	Adrift in the Pacific Ocean
	Financial_Orbit	Are you going to book an International Consolid…	2022-10-28 11:43:34	UK
	TravelToParis1	Top story: Cheap Flights: Austin or San Antonio…	2022-10-26 16:47:41	

TWEET MENTION

```
SELECT * FROM airline_passenger_satisfaction.TWEET_MENTIONS;
```



2:1

Filter Rows: Search Export: Fetch rows:

source_user	target_user
1591439263706529793	None
1591083176000360450	[User(username='IM_HiteshShah', id=11162015…
1591070011816579072	[User(username='British_Airways', id=18332190…
1590726567160090624	[User(username='AerLingus', id=281046179, di…
1590579016565919750	None
1590368573897469954	[User(username='Ryanair', id=1542862735, dis…
1589539443371020288	[User(username='wizzair', id=624837541, displa…
1589268697046077441	None
1589267942780579840	[User(username='British_Airways', id=18332190…
1589098076630790144	None
1589007031360696320	[User(username='qatarairways', id=14589119, d…
1588978028771962880	None
1588969376895467520	None
1588809139186114560	None
1588757025420619776	None
1588544065465114625	[User(username='LiveFromALounge', id=32548…
1587743596651970561	[User(username='shahid_ajari', id=248286642,…
1587742348682969088	[User(username='dududoxerox', id=299425765,…
1587431049801375744	[User(username='dududoxerox', id=299425765,…
1587369108638765056	[User(username='paul_worton', id=8754159446…
1587292345321619458	[User(username='RefaatAlMazrou', id=3939586…
1587259332915523585	[User(username='BTC_Archive', id=970994516…
1587074015272861696	[User(username='madlings01', id=420437811, d…
1586779335750725633	[User(username='billykembo', id=234130232, di…
1586476005262516224	[User(username='StevenPeterJon2', id=893623…
1586403032677306369	[User(username='British_Airways', id=18332190…

#SQL Statements for the conceptual model

```
create database airline_passenger_satisfaction;
```

#User Table:

```
CREATE TABLE USER(
twitter_handle VARCHAR(100),
name VARCHAR(100),
profile_image_url VARCHAR(200),
description VARCHAR(300),
followers_count BIGINT,
following_count BIGINT,
PRIMARY KEY  (twitter_handle));
```

#Tweets Table:

```
CREATE TABLE TWEETS(
tweet_id INT NOT NULL AUTO_INCREMENT,
twitter_handle VARCHAR(50),
tweet_text TEXT,
profile_image_url VARCHAR(200),
like_count integer,
created_at DATETIME,
PRIMARY KEY  (tweet_id));
```

#Tweet_Tags :

```
drop table TWEET_TAGS;
CREATE TABLE TWEET_TAGS(
tweet_id INT NOT NULL AUTO_INCREMENT ,
hashtags VARCHAR(200),
PRIMARY KEY  (tweet_id));
```

#Tweet_Mentions Table:

```
drop table TWEET_MENTIONS;
CREATE TABLE TWEET_MENTIONS (
tweet_id INT NOT NULL AUTO_INCREMENT ,
source_user text,
target_user text,
PRIMARY KEY  (tweet_id)
);
```

#Airlines_Table

```
drop table AIRLINES;
CREATE TABLE AIRLINES (
tweet_id INT NOT NULL AUTO_INCREMENT ,
airline VARCHAR(50),
name  VARCHAR(50),
tweet_text TEXT,
created_at DATETIME,
user_location VARCHAR(50),
PRIMARY KEY  (tweet_id)
);
```

#Airline_Sentiment

```
CREATE TABLE AIRLINE_SENTIMENT(
tweet_id INT NOT NULL AUTO_INCREMENT ,
airline_sentiment VARCHAR(50),
airline_sentiment_scale double,
negative_reason VARCHAR(50),
negative_reason_scale double,
airline VARCHAR(50),
name  VARCHAR(50),
PRIMARY KEY (tweet_id)
);
```

#Foreign Key Constraint
#Constraint for Tweet table:

```
ALTER TABLE TWEETS
ADD CONSTRAINT tweets_fk1 FOREIGN KEY (twitter_handle)
REFERENCES User(twitter_handle);

ALTER TABLE TWEETS
ADD CONSTRAINT tweets_fk2 FOREIGN KEY (profile_image_url)
REFERENCES User(profile_image_url);
```

#Constraint for Tweet_Tags table:

```
ALTER TABLE TWEET_TAGS
ADD CONSTRAINT Tweet_Tags_fk11 FOREIGN KEY (tweet_id)
REFERENCES Tweets(tweet_id);
```

#Constraint for Tweet_Mentions table:

```
ALTER TABLE TWEET_MENTIONS
ADD CONSTRAINT Tweet_Tags_fk3 FOREIGN KEY (tweet_id)
REFERENCES Tweets(tweet_id);
```

#Constraint for Tweet_Mentions Airlines Table

```
ALTER TABLE AIRLINES
ADD CONSTRAINT Tweet_Tags_fk6 FOREIGN KEY (tweet_id)
REFERENCES Tweets(tweet_id);
```

#Constraint for Tweet_Mentions Airlines Sentiment

```
ALTER TABLE AIRLINE_SENTIMENT
ADD CONSTRAINT Tweet_Tags_fk7 FOREIGN KEY (tweet_id)
REFERENCES Tweets(tweet_id);
```

USE-CASE.

RELATIONAL-ALGEBRA EXPRESSIONS FOR THE USE CASES

SQL STATEMENTS

Queries you must answer about your physical model (In Relational algebra & SQL):

1. What user posted this tweet?

   ```
   SELECT tweet_handle FROM tweets where tweet_id='12345';
   ```

   π tweet_handle σ tweet_id='12345'(tweets)

2. When did the user post this tweet?

   ```
   SELECT created_at FROM tweets where tweet_id='12345';
   ```

   π created_at σ tweet_id='12345'(tweets)

3. What tweets have this user posted in the past 24 hours?

   ```
   SELECT * FROM tweets
   WHERE tweet_handle='test' AND created_at >= INTERVAL 1 DAY;
   ```

   π * σ tweet_handle='test $\wedge$ created_at >= interval 1 day(tweets)

4. How many tweets have this user posted in the past 24 hours?

   ```
   SELECT count(*) FROM tweets
   WHERE tweet_handle='test' AND created_at >= INTERVAL 1 DAY;
   ```

5. When did this user join Twitter?
6. What keywords/ hashtags are popular?
7. What tweets are popular?

   ```
   SELECT * FROM tweets ORDER BY like_count DESC;
   ```

8. What percentage of customers are satisfied with Qatar?
9. How was user experience affected during pandemic for Qatar travellers?
10. How many positive reviews do we have for Qatar?

    ```
    SELECT * FROM  airline_sentiment where airline_sentiment='positive';
    ```

    π * σ airline_sentiment ='positive'(airline_sentiment)

11. What's the user satisfaction ratio in 2021 compared to 2020?

12. How many negative reviews do we have for Qatar?

    SELECT * FROM airline_sentiment where airline_sentiment='negative';

    $\pi * \sigma$ airline_sentiment ='negative'(airline_sentiment)

13. What percentage of customers are satisfied with Air France?
14. What are the top 3 best reviewed airlines?

15. How many reviews has user xyz given so far?

    SELECT * FROM tweets where tweet_handle='93845';

    $\pi * \sigma$ tweet_handle ='93845'(tweets)