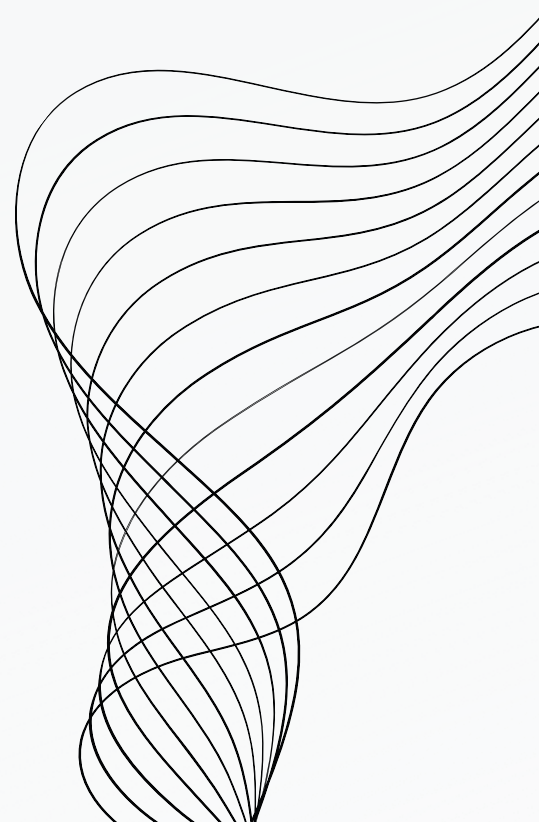


FLIGHT TICKETING

GROUP MEMBERS:

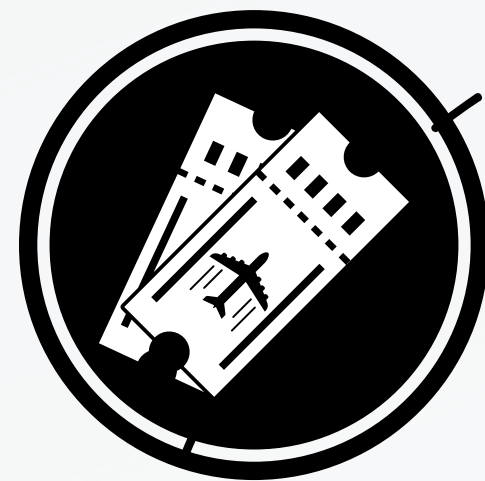
- Dennis Emir Adrian (2602206594)
 - Adam Ferdinand Malik Pawoko (2602172050)
 - Muhammad Athariq Naufal (2602162522)
 - Gilang Rizqi Priyantoro (2602206884)
- 

PROBLEM IDENTIFICATION

Sebuah maskapai penerbangan memiliki sistem manajemen tiket penerbangan mereka, Namun struktur data tersebut belum di organisir dengan baik dan perlu dinormalisasikan

OBJECTIVE

Tujuan kami adalah untuk menormalisasi dataset transaksi penerbangan. Target transaksi penerbangan yang telah kita tentukan adalah transaksi yang terjadi pada tanggal 12 April 2019.



VARIABLES

- Airline
- Date_of_Journey
- Departure
- Destination
- Route
- Dep_Time
- Arrival_Time
- Duration
- Total_Stops
- Additional_Info
- Price
- Passenger_Name
- Passenger_ID
- Class
- Class_ID
- Flight_ID
- Ticket_ID

UNNORMALIZED FORM

Airline	Date_of_Journey	Departure	Destination	Route	Dep_Time	Arrival_Time	Duration	Total_Stops	Additional_Info	Price	Passenger_Name	Passenger_ID	Class	Class_ID	Flight_ID	Ticket_ID	Email
SpiceJet	12/4/2019	Kolkata	Banglore	CCU , BLR	22:20	13/04/2023 00:40	2h 20m	0	No info	3873	Kelly Sellers	ID196003016725	Economy	1	FL148	T229	Joseph@gmail.com
IndiGo	12/4/2019	Banglore	Delhi	BLR , DEL	7:10	10:05	2h 55m	0	No info	4823	Natalie Clay	ID196006082462	Economy	1	FL774	T171	Erik@gmail.com
Jet Airways	12/4/2019	Banglore	Delhi	BLR , DEL	7:10	10:10	3h	0	No info	7229	Dr. Terry Friedman	ID196012072833	Economy	1	FL366	T362	Thomas@gmail.com
Air India	12/4/2019	Banglore	Delhi	BLR , DEL	10:00	12:45	2h 45m	0	No info	5911	Erik Perez	ID196101084768	Economy	1	FL956	T337	Joshua@gmail.com
IndiGo	12/4/2019	Banglore	Delhi	BLR , DEL	21:15	13/04/2023 00:15	3h	0	No info	4990	Justin Bates	ID196104036219	Economy	1	FL947	T868	Sabrina@gmail.com
Air India	12/4/2019	Banglore	Delhi	BLR , DEL	13:20	16:10	2h 50m	0	No info	5911	Kristy Anderson	ID196204019041	Economy	1	FL253	T931	Jerry@gmail.com
GoAir	12/4/2019	Banglore	Delhi	BLR , DEL	11:40	14:30	2h 50m	0	No info	4937	Vanessa Valdez	ID196212008867	Economy	1	FL452	T909	Kathryn@gmail.com
IndiGo	12/4/2019	Kolkata	Banglore	CCU , BLR	20:20	22:55	2h 35m	0	No info	4488	Jerry Gould	ID196303070810	Economy	1	FL991	T677	Yvette@gmail.com
Jet Airways	12/4/2019	Banglore	Delhi	BLR , DEL	18:55	22:00	3h 5m	0	No info	7229	Heather Diaz	ID196402057213	Economy	1	FL299	T183	Michael@gmail.com
SpiceJet	12/4/2019	Banglore	Delhi	BLR , DEL	21:10	13/04/2023 00:05	2h 55m	0	No info	5621	Joshua Campbell	ID196405022797	Economy	1	FL114	T764	Lindsey@gmail.com
IndiGo	12/4/2019	Banglore	Delhi	BLR , DEL	8:30	11:20	2h 50m	0	No info	4823	Alex Vaughn	ID196409077206	Economy	1	FL365	T345	Veronica@gmail.com
GoAir	12/4/2019	Banglore	Delhi	BLR , DEL	7:45	10:40	2h 55m	0	No info	6722	Jonathan Rodrigu	ID196504067959	Economy	1	FL329	T467	Jonathan@gmail.com
IndiGo	12/4/2019	Kolkata	Banglore	CCU , BLR	15:15	17:45	2h 30m	0	No info	4174	Peter Burnett	ID196508049872	Economy	1	FL687	T477	Lonnie@gmail.com
IndiGo	12/4/2019	Kolkata	Banglore	CCU , BLR	17:15	19:50	2h 35m	0	No info	4174	Stephanie Conrac	ID196509079854	Economy	1	FL891	T421	Stephanie@gmail.com
IndiGo	12/4/2019	Kolkata	Banglore	CCU , BLR	4:40	7:15	2h 35m	0	No info	4174	Yvette Farrell	ID196510043663	Economy	1	FL653	T588	Debbie@gmail.com
Air India	12/4/2019	Kolkata	Banglore	CCU , BLR	20:45	23:20	2h 35m	0	No info	4460	Thomas Pacheco	ID196602081381	Economy	1	FL370	T579	Kristy@gmail.com
IndiGo	12/4/2019	Banglore	Delhi	BLR , DEL	20:00	22:50	2h 50m	0	No info	4990	Jennifer Morris	ID196606068163	Economy	1	FL593	T482	Dylan@gmail.com
IndiGo	12/4/2019	Banglore	Delhi	BLR , DEL	4:00	6:50	2h 50m	0	No info	4423	Matthew Nelson	ID196704010295	Economy	1	FL874	T102	Debra@gmail.com
SpiceJet	12/4/2019	Banglore	Delhi	BLR , DEL	5:55	8:35	2h 40m	0	No check-in baggage include	4319	Debbie Cox	ID196711017229	Economy	1	FL237	T619	Leroy@gmail.com
Vistara	12/4/2019	Banglore	Delhi	BLR , DEL	9:45	12:35	2h 50m	0	No info	5403	Lonnie Johnson	ID196912083080	Economy	1	FL870	T603	Joshua@gmail.com

Pada tahap ini, struktur tabel belum terorganisir dengan baik dikarenakan masih ada column yang mengandung dua nilai.

1 NORMALIZED FORM

Airline	Date_of_Journey	Departure	Destination	Route	Dep_Time	Arrival_Time	Duration	Total_Stops	Additional_Info	Price	Passenger_Name	Passenger_ID	Class	Class_ID	Flight_ID	Ticket_ID	Email
SpiceJet	12/4/2019	Kolkata	Banglore	CCU , BLR	22:20	0:40	2h 20m	0	No info	3873	Kelly Sellers	ID196003016725	Economy	1	FL148	T229	Joseph@gmail.com
IndiGo	12/4/2019	Banglore	Delhi	BLR , DEL	7:10	10:05	2h 55m	0	No info	4823	Natalie Clay	ID196006082462	Economy	1	FL774	T171	Erik@gmail.com
Jet Airways	12/4/2019	Banglore	Delhi	BLR , DEL	7:10	10:10	3h	0	No info	7229	Dr. Terry Friedman	ID196012072833	Economy	1	FL366	T362	Thomas@gmail.com
Air India	12/4/2019	Banglore	Delhi	BLR , DEL	10:00	12:45	2h 45m	0	No info	5911	Erik Perez	ID196101084768	Economy	1	FL956	T337	Joshua@gmail.com
IndiGo	12/4/2019	Banglore	Delhi	BLR , DEL	21:15	0:15	3h	0	No info	4990	Justin Bates	ID196104036219	Economy	1	FL947	T868	Sabrina@gmail.com
Air India	12/4/2019	Banglore	Delhi	BLR , DEL	13:20	16:10	2h 50m	0	No info	5911	Kristy Anderson	ID196204019041	Economy	1	FL253	T931	Jerry@gmail.com
GoAir	12/4/2019	Banglore	Delhi	BLR , DEL	11:40	14:30	2h 50m	0	No info	4937	Vanessa Valdez	ID196212008867	Economy	1	FL452	T909	Kathryn@gmail.com
IndiGo	12/4/2019	Kolkata	Banglore	CCU , BLR	20:20	22:55	2h 35m	0	No info	4488	Jerry Gould	ID196303070810	Economy	1	FL991	T677	Yvette@gmail.com
Jet Airways	12/4/2019	Banglore	Delhi	BLR , DEL	18:55	22:00	3h 5m	0	No info	7229	Heather Diaz	ID196402057213	Economy	1	FL299	T183	Michael@gmail.com
SpiceJet	12/4/2019	Banglore	Delhi	BLR , DEL	21:10	0:05	2h 55m	0	No info	5621	Joshua Campbell	ID196405022797	Economy	1	FL114	T764	Lindsey@gmail.com
IndiGo	12/4/2019	Banglore	Delhi	BLR , DEL	8:30	11:20	2h 50m	0	No info	4823	Alex Vaughn	ID196409077206	Economy	1	FL365	T345	Veronica@gmail.com
GoAir	12/4/2019	Banglore	Delhi	BLR , DEL	7:45	10:40	2h 55m	0	No info	6722	Jonathan Rodriguez	ID196504067959	Economy	1	FL329	T467	Jonathan@gmail.com
IndiGo	12/4/2019	Kolkata	Banglore	CCU , BLR	15:15	17:45	2h 30m	0	No info	4174	Peter Burnett	ID196508049872	Economy	1	FL687	T477	Lonnie@gmail.com
IndiGo	12/4/2019	Kolkata	Banglore	CCU , BLR	17:15	19:50	2h 35m	0	No info	4174	Stephanie Conrad	ID196509079854	Economy	1	FL891	T421	Stephanie@gmail.com
IndiGo	12/4/2019	Kolkata	Banglore	CCU , BLR	4:40	7:15	2h 35m	0	No info	4174	Yvette Farrell	ID196510043663	Economy	1	FL653	T588	Debbie@gmail.com
Air India	12/4/2019	Kolkata	Banglore	CCU , BLR	20:45	23:20	2h 35m	0	No info	4460	Thomas Pacheco	ID196602081381	Economy	1	FL370	T579	Kristy@gmail.com
IndiGo	12/4/2019	Banglore	Delhi	BLR , DEL	20:00	22:50	2h 50m	0	No info	4990	Jennifer Morris	ID196606068163	Economy	1	FL593	T482	Dylan@gmail.com
IndiGo	12/4/2019	Banglore	Delhi	BLR , DEL	4:00	6:50	2h 50m	0	No info	4423	Matthew Nelson	ID196704010295	Economy	1	FL874	T102	Debra@gmail.com
SpiceJet	12/4/2019	Banglore	Delhi	BLR , DEL	5:55	8:35	2h 40m	0	No check-in baggage included	4319	Debbie Cox	ID196711017229	Economy	1	FL237	T619	Leroy@gmail.com
Vistara	12/4/2019	Banglore	Delhi	BLR , DEL	9:45	12:35	2h 50m	0	No info	5403	Lonnie Johnson	ID196912083080	Economy	1	FL870	T603	Joshua@gmail.com

Pada tahap ini, kami menghilangkan tanggal di beberapa row di kolom Arrival_Time, menghilangkan kelompok yang berulang, dan memastikan setiap atribut memiliki satu nilai. Ini melibatkan pemisahan atribut multivalued menjadi kolom-kolom terpisah.

2 NORMALIZED FORM

Flight Entity														
Flight_ID	Airline	Date_of_Journey	Departure	Destination	Route	Dep_Time	Arrival_Time	Duration	Total_Stops	Additional_Info	Price	Class	Class_ID	Ticket_ID
FL148	SpiceJet	04/12/2019	Kolkata	Banglore	CCU , BLR	22:20	00:40	2h 20m	0	No info	3873	Economy	1	T229
FL774	IndiGo	04/12/2019	Banglore	Delhi	BLR , DEL	07:10	10:05	2h 55m	0	No info	4823	Economy	1	T171
FL366	Jet Airways	04/12/2019	Banglore	Delhi	BLR , DEL	07:10	10:10	3h	0	No info	7229	Economy	1	T362
FL956	Air India	04/12/2019	Banglore	Delhi	BLR , DEL	10:00	12:45	2h 45m	0	No info	5911	Economy	1	T337
FL947	IndiGo	04/12/2019	Banglore	Delhi	BLR , DEL	21:15	00:15	3h	0	No info	4990	Economy	1	T868
FL253	Air India	04/12/2019	Banglore	Delhi	BLR , DEL	13:20	16:10	2h 50m	0	No info	5911	Economy	1	T931
FL452	GoAir	04/12/2019	Banglore	Delhi	BLR , DEL	11:40	14:30	2h 50m	0	No info	4937	Economy	1	T909
FL991	IndiGo	04/12/2019	Kolkata	Banglore	CCU , BLR	20:20	22:55	2h 35m	0	No info	4488	Economy	1	T677
FL299	Jet Airways	04/12/2019	Banglore	Delhi	BLR , DEL	18:55	22:00	3h 5m	0	No info	7229	Economy	1	T183
FL114	SpiceJet	04/12/2019	Banglore	Delhi	BLR , DEL	21:10	00:05	2h 55m	0	No info	5621	Economy	1	T764
FL365	IndiGo	04/12/2019	Banglore	Delhi	BLR , DEL	08:30	11:20	2h 50m	0	No info	4823	Economy	1	T345
FL329	GoAir	04/12/2019	Banglore	Delhi	BLR , DEL	07:45	10:40	2h 55m	0	No info	6722	Economy	1	T467
FL687	IndiGo	04/12/2019	Kolkata	Banglore	CCU , BLR	15:15	17:45	2h 30m	0	No info	4174	Economy	1	T477

Passenger Entity			
Passenger_Name	Passenger_ID*	Email	Ticket_ID
Kelly Sellers	ID196003016725	Joseph@gmail.com	T229
Natalie Clay	ID196006082462	Erik@gmail.com	T171
Dr. Terry Friedman	ID196012072833	Thomas@gmail.com	T362
Erik Perez	ID196101084768	Joshua@gmail.com	T337
Justin Bates	ID196104036219	Sabrina@gmail.com	T868
Kristy Anderson	ID196204019041	Jerry@gmail.com	T931
Vanessa Valdez	ID196212008867	Kathryn@gmail.com	T909
Jerry Gould	ID196303070810	Yvette@gmail.com	T677
Heather Diaz	ID196402057213	Michael@gmail.com	T183
Joshua Campbell	ID196405022797	Lindsey@gmail.com	T764
Alex Vaughn	ID196409077206	Veronica@gmail.com	T345
Jonathan Rodriguez	ID196504067959	Jonathan@gmail.com	T467
Peter Burnett	ID196508049872	Lonnie@gmail.com	T477

Dalam 2NF, kami memisahkan tabel tersebut menjadi 2 tabel, yaitu Flight entity dan Passenger entity. memastikan bahwa semua atribut non-key sepenuhnya bergantung fungsi pada primary key.

3 NORMALIZED FORM

Flight Entity										
Flight_ID*	Airline	Date_of_Jour	Departure	Destination	Route	Dep_Time	Arrival_Tim	Duration	Total_Stops	Additional Price
FL148	SpiceJet	04/12/2019	Kolkata	Banglore	CCU , BLR	22:20	00:40	2h 20m	0	No info 3873
FL774	IndiGo	04/12/2019	Banglore	Delhi	BLR , DEL	07:10	10:05	2h 55m	0	No info 4823
FL366	Jet Airways	04/12/2019	Banglore	Delhi	BLR , DEL	07:10	10:10	3h	0	No info 7229
FL956	Air India	04/12/2019	Banglore	Delhi	BLR , DEL	10:00	12:45	2h 45m	0	No info 5911
FL947	IndiGo	04/12/2019	Banglore	Delhi	BLR , DEL	21:15	00:15	3h	0	No info 4990
FL253	Air India	04/12/2019	Banglore	Delhi	BLR , DEL	13:20	16:10	2h 50m	0	No info 5911
FL452	GoAir	04/12/2019	Banglore	Delhi	BLR , DEL	11:40	14:30	2h 50m	0	No info 4937

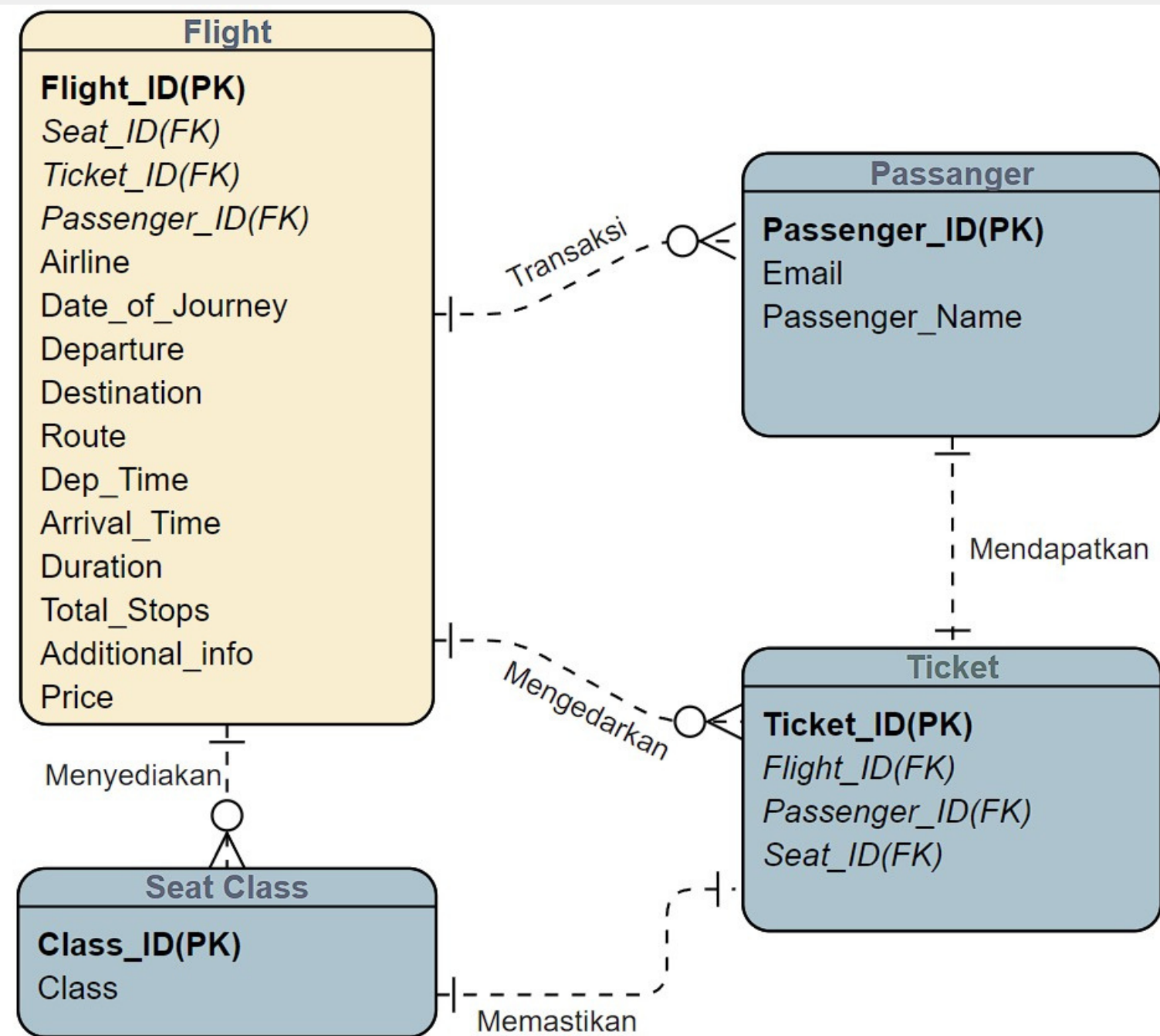
Seat Class Entity	
Class_ID	Class
1	Economy
1	Economy
1	Economy
1	Economy
1	Economy
1	Economy
1	Economy

Ticket Entity			
Ticket_ID	Flight_ID	Passenger_ID	Class_ID
T229	FL148	ID196003016725	1
T171	FL774	ID196006082462	1
T362	FL366	ID196012072833	1
T337	FL956	ID196101084768	1
T868	FL947	ID196104036219	1
T931	FL253	ID196204019041	1
T909	FL452	ID196212008867	1

Passenger Entity		
Passenger_ID	Email	Passenger_Name
ID196003016725	Joseph@gmail.com	Kelly Sellers
ID196006082462	Erik@gmail.com	Natalie Clay
ID196012072833	Thomas@gmail.com	Dr. Terry Friedman
ID196101084768	Joshua@gmail.com	Erik Perez
ID196104036219	Sabrina@gmail.com	Justin Bates
ID196204019041	Jerry@gmail.com	Kristy Anderson
ID196212008867	Kathryn@gmail.com	Vanessa Valdez

pada tabel 3NF ini masing masing tabel yg memiliki hubungan transitiv
kita satukan dalam tabel tiket

ERD



Relationship:

- satu penerbangan mengangkut banyak penumpang
- satu penerbangan memiliki banyak kelas tempat duduk
- satu penerbangan memiliki banyak tiket
- satu tempat duduk dimiliki satu tiket
- satu penumpang memiliki satu tiket

CONCLUSION

Setelah melakukan normalisasi dari keadaan yang belum dinormalisasi hingga mencapai bentuk normalisasi ketiga (3NF), database telah mengalami transformasi yang signifikan. Proses ini melibatkan restrukturisasi data secara sistematis, menangani masalah terkait redundansi, anomali pembaruan, dan ketergantungan antar atribut. Dengan mencapai 3NF, database sekarang menunjukkan struktur yang terorganisir dengan baik, bebas dari ketergantungan transitif dan informasi yang tidak perlu. Proses normalisasi ini sangat meningkatkan integritas data, mengurangi kemungkinan terjadinya anomali, dan meningkatkan efisiensi dan kegunaan keseluruhan database untuk operasi maskapai penerbangan, informasi penumpang, dan manajemen penerbangan.

