

After 1NF

Assumptions: 1. In Bar, Y stands for (Yes i.e., bar is available) and N for Not Available,
Similarly, for License Y stands for yes and N stands for No

2. C_id, Boat_id, Staff_id, serviceid are unique and cannot be null.

3. Duty stands for the steward duty.

4. wifi stands for the Bandwidth.

C_ID	First_name	Last_name	CStreet	CCity	CPhone
1	Pearl	Wilson	AA2	Thrissur	9900105546
1	Pearl	Wilson	AA2	Thrissur	9900105546
1	Pearl	Wilson	AA2	Thrissur	9900105546
2	Ardra	Raj	SD4	Kollam	8547565311
2	Ardra	Raj	SD5	Kollam	8547565311
3	Sandra	Bino	R-road	Kollam	8547519028
3	Sandra	Bino	R-road	Kollam	8547519028
4	Gopika	Suresh	MP2	Palghat	7547565311
4	Gopika	Suresh	MP3	Palghat	7547565311
4	Gopika	Suresh	MP4	Palghat	7547565311
5	Gopika P	Prem	GB1	Palghat	8547565311

Owner_id	O_name	License	Boat_id	Staff_id	Salary	rating	Captainname	duty	stewardname
a102	Ramesh	N	XX1	ST1	60000	5	Shamim	Cook	Ganesh
b102	Puneet	Y	XX2	ST2	20000	4	Nadir	Cook	Dinesh
a102	Ramesh	N	XX1	ST1	60000	5	Shamim	Cook	Ganesh
a103	Ramesh	N	XX1	ST1	20000	5	Shamim	Cook	Ganesh
b103	Puneet	Y	XX2	ST2	30000	3	Nadir	Cook	Dinesh
g102	Dhairya	N	XX56	ST009	90000	2	Himesh	Cook	Ganesh
a104	Ramesh	N	XX1	ST1	50000	3	Shamim	Cook	Ganesh
b104	Puneet	Y	XX2	ST2	90000	4	Nadir	Cook	Dinesh
a104	Ramesh	N	XX1	ST1	40000	5	Shamim	Cook	Ganesh
a105	Ramesh	N	XX1	ST1	30000	5	Shamim	Cook	Ganesh
b105	Puneet	Y	XX2	ST2	20000	4	Nadir	Cook	Dinesh

insuranceno	capacity	from date	to date	starting point	destination	spots	payment amt	payment method	payment status	serviceid	food	bar	wifi
1245	30	21/3/20	23/3/20	Alumkadavu	Kumarakam	3	20000	card	Y	SV1	Chinese	Y	100MHz
3467	45	1/2/2020	3/2/2020	Alleppey	Kumarakam	4	30000	gpay	Y	SV2	Asian	Y	200MHz
1245	30	21/3/20	23/3/20	Alleppey	Alumkadavu	4	40000	gpay	Y	SV2	Asian	Y	200MHz
3456	35	21/3/21	23/3/21	Alumkadavu	Kumarakam	4	50000	card	Y	SV1	Chinese	Y	100MHz
1245	35	1/2/2020	3/2/2020	Alleppey	Kumarakam	4	60000	gpay	Y	SV2	Asian	Y	200MHz
1245	35	21/3/21	23/3/21	Alleppey	Alumkadavu	8	70000	gpay	Y	SV2	Asian	Y	200MHz
3456	35	21/3/22	23/3/22	Alumkadavu	Kumarakam	4	80000	card	Y	SV1	Chinese	Y	100MHz
1245	35	1/2/2020	3/2/2020	Alleppey	Kumarakam	6	90000	gpay	Y	SV2	Asian	Y	200MHz
4567	35	21/3/22	23/3/22	Alleppey	Alumkadavu	8	100000	gpay	Y	SV2	Asian	Y	200MHz
5678	35	21/3/23	23/3/23	Alumkadavu	Kumarakam	4	110000	card	Y	SV1	Chinese	Y	100MHz
1245	35	1/2/2020	3/2/2020	Alleppey	Kumarakam	6	120000	gpay	Y	SV2	Asian	Y	200MHz

After 2NF

1.Customer table

C_ID	First_name	Last_name	CStreet	CCity	CPhone
1	Pearl	Wilson	AA2	Thrissur	9900105546
1	Pearl	Wilson	AA2	Thrissur	9900105546
1	Pearl	Wilson	AA2	Thrissur	9900105546
2	Ardra	Raj	SD4	Kollam	8547565311
2	Ardra	Raj	SD5	Kollam	8547565311
3	Sandra	Bino	R-road	Kollam	8547519028
3	Sandra	Bino	R-road	Kollam	8547519028
4	Gopika	Suresh	MP2	Palghat	7547565311
4	Gopika	Suresh	MP3	Palghat	7547565311
4	Gopika	Suresh	MP4	Palghat	7547565311
5	Gopika P	Prem	GB1	Palghat	8547565311

Primary Key: C_ID

2. Owner table

Owner_id	O_name	License
a102	Ramesh	N
b102	Puneet	Y
a102	Ramesh	N
a103	Ramesh	N
b103	Puneet	Y
g102	Dhairya	N
a104	Ramesh	N
b104	Puneet	Y
a104	Ramesh	N
a105	Ramesh	N
b105	Puneet	Y

Primary-Key: Owner_id

3. Boat details table

Boat_id	insurancer	capacity
XX1	1245	30
XX2	3467	45
XX1	1245	30
XX1	3456	35
XX2	1245	35
XX56	1245	35
XX1	3456	35
XX2	1245	35
XX1	4567	35
XX1	5678	35
XX2	1245	35

Primary Key: Boat_id

4. Staff table

Staff_id	Salary	rating	Captainname	duty	stewardname
ST1	60000	5	Shamim	Cook	Ganesh
ST2	20000	4	Nadir	Cook	Dinesh
ST1	60000	5	Shamim	Cook	Ganesh
ST1	20000	5	Shamim	Cook	Ganesh
ST2	30000	3	Nadir	Cook	Dinesh
ST009	90000	2	Himesh	Cook	Ganesh
ST1	50000	3	Shamim	Cook	Ganesh
ST2	90000	4	Nadir	Cook	Dinesh
ST1	40000	5	Shamim	Cook	Ganesh
ST1	30000	5	Shamim	Cook	Ganesh
ST2	20000	4	Nadir	Cook	Dinesh

Primary key:Staff_id

5.Transaction table

transaction_id	from date	to date	starting pc	destination	spots	payment a	payment method	payment status
a0	21/3/20	23/3/20	Alumkada	Kumarakam	3	20000	card	Y
a1	1/2/2020	3/2/2020	Alleppey	Kumarakam	4	30000	gpay	Y
a2	21/3/20	23/3/20	Alleppey	Alumkadavu	4	40000	gpay	Y
a3	21/3/21	23/3/21	Alumkada	Kumarakam	4	50000	card	Y
a4	1/2/2020	3/2/2020	Alleppey	Kumarakam	4	60000	gpay	Y
a5	21/3/21	23/3/21	Alleppey	Alumkadavu	8	70000	gpay	Y
a6	21/3/22	23/3/22	Alumkada	Kumarakam	4	80000	card	Y
a7	1/2/2020	3/2/2020	Alleppey	Kumarakam	6	90000	gpay	Y
a8	21/3/22	23/3/22	Alleppey	Alumkadavu	8	100000	gpay	Y
a9	21/3/23	23/3/23	Alumkada	Kumarakam	4	110000	card	Y
a10	1/2/2020	3/2/2020	Alleppey	Kumarakam	6	120000	gpay	Y

Primary Key: transaction_id

6.Service table

serviceid	food	bar	wifi
SV1	Chinese	Y	100MHz
SV2	Asian	Y	200MHz
SV2	Asian	Y	200MHz
SV1	Chinese	Y	100MHz
SV2	Asian	Y	200MHz
SV2	Asian	Y	200MHz
SV1	Chinese	Y	100MHz
SV2	Asian	Y	200MHz
SV2	Asian	Y	200MHz
SV1	Chinese	Y	100MHz
SV2	Asian	Y	200MHz

After 3NF

1.Customer table

C_ID	First_name	Last_name	CStreet	CCity	CPhone
1	Pearl	Wilson	AA2	Thrissur	9900105546
1	Pearl	Wilson	AA2	Thrissur	9900105546
1	Pearl	Wilson	AA2	Thrissur	9900105546
2	Ardra	Raj	SD4	Kollam	8547565311
2	Ardra	Raj	SD5	Kollam	8547565311
3	Sandra	Bino	R-road	Kollam	8547519028
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4	Gopika	Suresh	MP4	Palghat	7547565311
5	Gopika P	Prem	GB1	Palghat	8547565311

2. Owner table

Owner_id	O_name	License
a102	Ramesh	N
b102	Puneet	Y
a102	Ramesh	N
a103	Ramesh	N
b103	Puneet	Y
g102	Dhairya	N
a104	Ramesh	N
b104	Puneet	Y
a104	Ramesh	N
a105	Ramesh	N
b105	Puneet	Y

3.Boat details table

Boat_id	insurancer	capacity
XX1	1245	30
XX2	3467	45
XX1	1245	30
XX1	3456	35
XX2	1245	35
XX56	1245	35
XX1	3456	35
XX2	1245	35
XX1	4567	35
XX1	5678	35
XX2	1245	35

4.Staff table (Captain)

Staff_id	Salary	rating	Captainname
ST1	60000	5	Shamim
ST2	20000	4	Nadir
ST1	60000	5	Shamim
ST1	20000	5	Shamim
ST2	30000	3	Nadir
ST009	90000	2	Himesh
ST1	50000	3	Shamim
ST2	90000	4	Nadir
ST1	40000	5	Shamim
ST1	30000	5	Shamim
ST2	20000	4	Nadir

5. Staff table (Steward)

Staff_id	Salary	rating	duty	stewardname
STSW1	60000	5	Cook	Ganesh
STSW2	20000	4	Cook	Dinesh
STSW1	60000	5	Cook	Ganesh
STSW1	20000	5	Cook	Ganesh
STSW2	30000	3	Cook	Dinesh
STSW1	90000	2	Cook	Ganesh
STSW1	50000	3	Cook	Ganesh
STSW2	90000	4	Cook	Dinesh
STSW1	40000	5	Cook	Ganesh
STSW1	30000	5	Cook	Ganesh
STSW2	20000	4	Cook	Dinesh

6. Transaction table

transaction_id	from date	to date	starting pc	destination	spots	payment a	payment method	payment status
a0	21/3/20	23/3/20	Alumkada	Kumarakam	3	20000	card	Y
a1	1/2/2020	3/2/2020	Alleppey	Kumarakam	4	30000	gpay	Y
a2	21/3/20	23/3/20	Alleppey	Alumkadavu	4	40000	gpay	Y
a3	21/3/21	23/3/21	Alumkada	Kumarakam	4	50000	card	Y
a4	1/2/2020	3/2/2020	Alleppey	Kumarakam	4	60000	gpay	Y
a5	21/3/21	23/3/21	Alleppey	Alumkadavu	8	70000	gpay	Y
a6	21/3/22	23/3/22	Alumkada	Kumarakam	4	80000	card	Y
a7	1/2/2020	3/2/2020	Alleppey	Kumarakam	6	90000	gpay	Y
a8	21/3/22	23/3/22	Alleppey	Alumkadavu	8	100000	gpay	Y
a9	21/3/23	23/3/23	Alumkada	Kumarakam	4	110000	card	Y
a10	1/2/2020	3/2/2020	Alleppey	Kumarakam	6	120000	gpay	Y

7.Service table

serviceid	food	bar	wifi
SV1	Chinese	Y	100MHz
SV2	Asian	Y	200MHz
SV2	Asian	Y	200MHz
SV1	Chinese	Y	100MHz
SV2	Asian	Y	200MHz
SV2	Asian	Y	200MHz
SV1	Chinese	Y	100MHz
SV2	Asian	Y	200MHz
SV2	Asian	Y	200MHz
SV1	Chinese	Y	100MHz
SV2	Asian	Y	200MHz

Conclusion

In our ER model, we had 8 entities Owner, Customer, Houseboat, Transaction details, Captain, Steward, Staff and services.

Where,

Owner(Owner_id(pk))

Customer(C_id(pk), Boat_id(fk))

Houseboat (Boat_id(pk), Owner_id(fk))

Staff(Boat_id(fk),Staff_id(pk), Owner_id(fk))

Captain(Boat_id(fk),staff_id(pk))

Steward(Boat_id(fk), staff_id(pk))

During Normalisation,

After 1NF,

All the attributes were confirmed to be atomic and there were no multivalued or composite attributes.

After 2NF

All partial dependencies were removed. The table was divided to 6 sub tables

Customer table

Owner table

Boat details table

Staff table

Transaction table

Service table

After 3NF

Free of transitive dependency. No non-prime attributes depending on another non-prime attribute. Staff table further sub divided into Staff details captain and staff details steward. Finally, after 3NF, we have a total of 7 tables.

