UCT402: DATABASE MANAGEMENT SYSTEM (DBMS

OUR PROJECT - PATHOLOGY LABORATORY RECORD MANAGEMENT SYSTEM

Submitted By: MISHTI DANG (101918029)

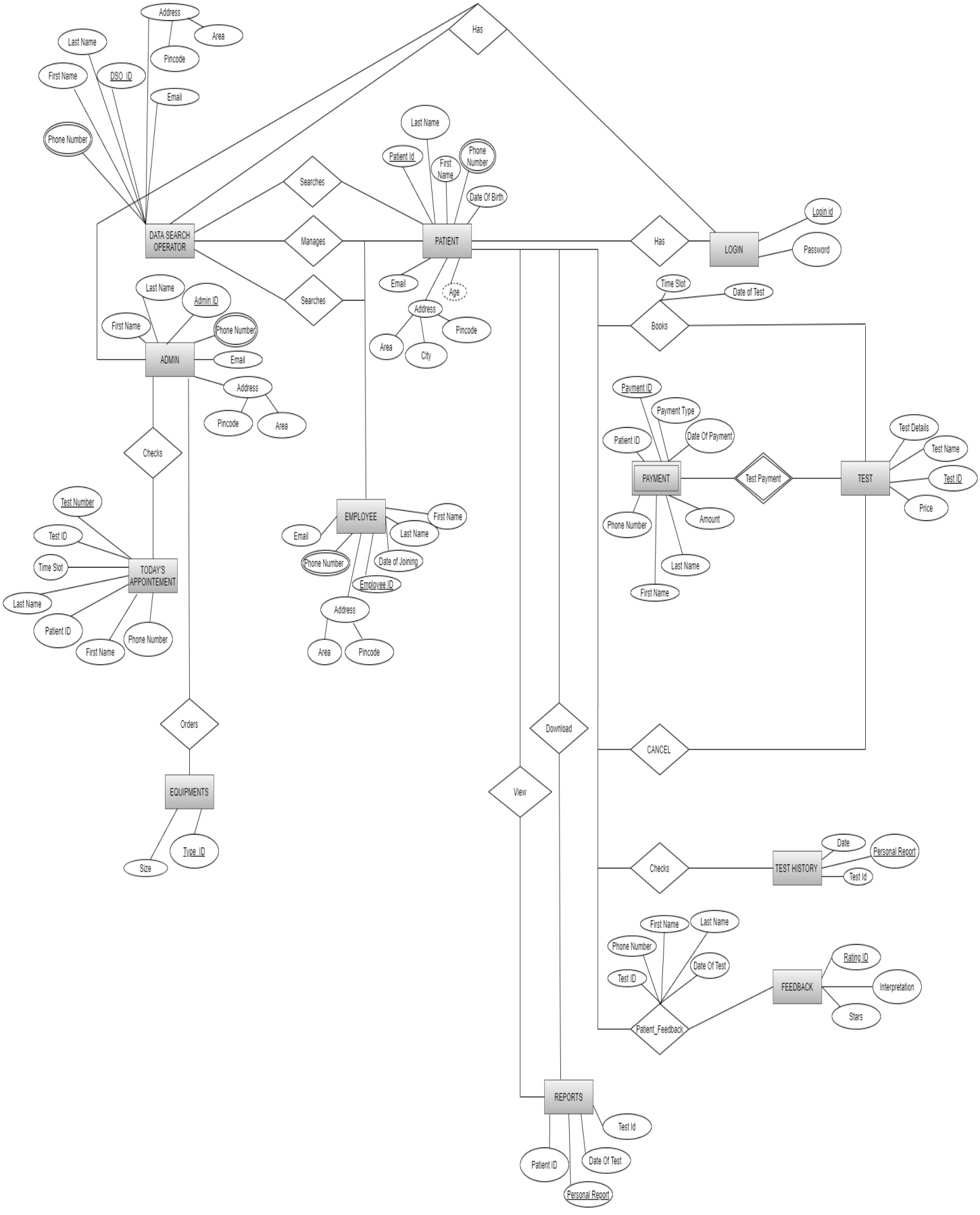
[GROUP 3-

MISHTI DANG (101918029)

SAKSHI VATS(101918041)

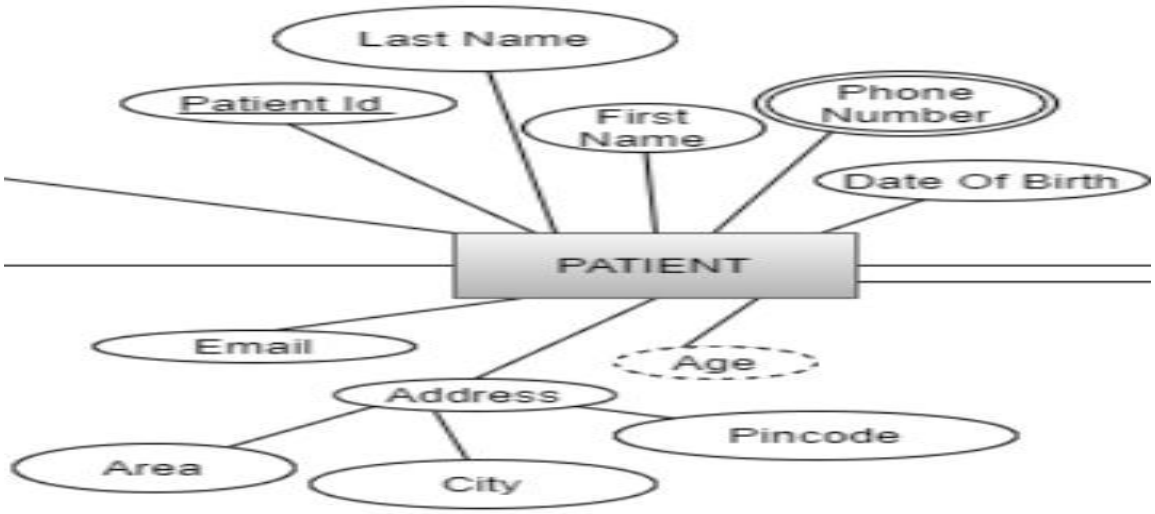
SEHAJDEEP SINGH KHURANA(101918044)]

OUR ER DIAGRAM



CONVERTING ER DIAGRAM TO TABLES

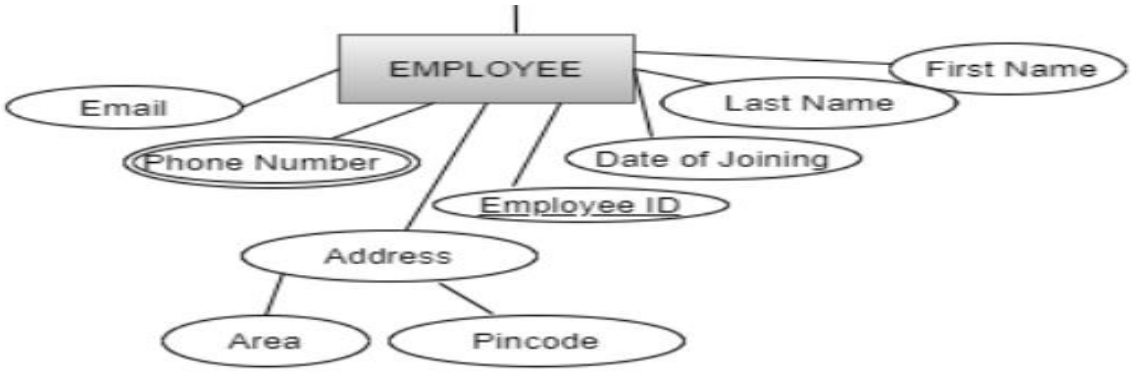
1) CONVERTING PATIENT ENTITY TO TABLE



FIRST NAME	LAST NAME	PATIENT ID	DATE OF BIRTH	ADDRESS	CITY	ZIPCODE	EMAIL
Ananya	Mittal	188769	25/7/1996	Road 8, Sec E	Patiala	22345	ananya123@gmail.com
Meena	Kapoor	112890	16/2/1994	Sector O, Vikas Puri	Lucknow	23421	meena@gmail.com
Sana	Singh	175648	03/9/1970	Himgiri Apartments ,Vaishali Nagar	Lucknow	24356	s_singh3@gmail.com
Soumya	Sharma	134562	28/5/1985	Block 10, Sadar Bazaar	Ludhiana	28190	soumya28@gmail.com
Avinash	Rai	188756	12/5/1965	Chandralok Aliganj	Patiala	22346	arai_08@gmail.com
Arya	Sharma	127898	08/1/1979	Prashant Apartments, Mayur Vihar	Patiala	22367	sharma_a@gmail.com
Nandini	Gupta	178923	12/12/1985	Prashant Apartments, Mayur Vihar	Agra	22435	nandini@gmail.com
Karan	Kapoor	165754	16/2/1994	Sohan Colony, Nakasganj	Lucknow	226024	karan_k@gmail.com
Swati	Pandey	187980	03/9/1970	Aks Colony, Shahi Nagar	Lucknow	226013	swati09@gmail.com
Ashveka	Pandey	190023	21/07/2011	Aks Colony, Shahi Nagar	Lucknow	226024	swati09@gmail.com

PATIENT ID	PHONE NUMBER
188769	8749956789
112890	7859456325
175648	8541259636, 7451263689
134562	9887412563
188756	9687402153
127898	8809745231,7415896257
178923	7996840000
165754	7894512033
187980	9874863271
190023	9874863271

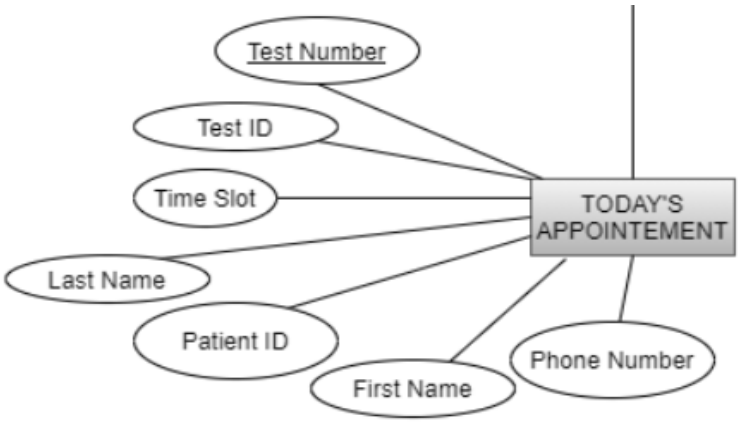
2) CONVERTING EMPLOYEE ENTITY TO TABLE



EMPLOYEE ID	FIRST NAME	LAST NAME	DATE OF JOINING	AREA	PINCODE	EMAIL
156	Raj	Kumar	15/05/2017	Sec A, Road 10, Behind Children Park	23458	raj@gmail.com
134	Shikhar	Yadav	02/07/2019	Aks Colony, Shahi Nagar	11234	shikhar11@gmail.com
128	Anand	Singh	11/02/2018	Sahu Apartments, Gharaganj	89768	ana_singh@gmail.com
138	Hemant	Kumar	15/05/2017	Niketan Apartments, Vikas Nagar	45324	hemantk@gmail.com

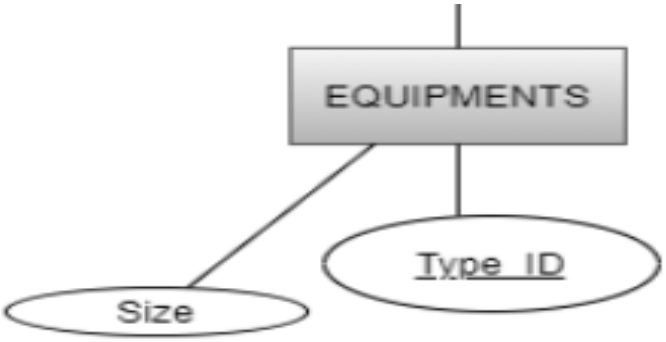
EMPLOYEE ID	PHONE NUMBER
156	9806788909
134	8471256356, 8956241358
128	9879878540
138	859647125

3) CONVERTING TODAYS APPOINTMENT ENTITY INTO TABLE



TEST NUMBER	PATIENT_ID	FIRST NAME	LAST NAME	PHONE NUMBER	TEST ID	TIME SLOT
13456	175648	Sana	Singh	7451263689	11_BT	8.00AM
13457	165754	Karan	Kapoor	7894512033	19_CRT	8.00AM
13458	127898	Arya	Sharma	7415896257	11_BT	1.00PM
13459	175648	Sana	Singh	7451263689	19_CRT	3.00PM
13460	165754	Karan	Kapoor	7894512033	RPAN	1:30PM
13461	165754	Karan	Kapoor	7894512033	RPAN	6:30PM

4) CONVERTING EQUIPMENTS ENTITY INTO TABLE

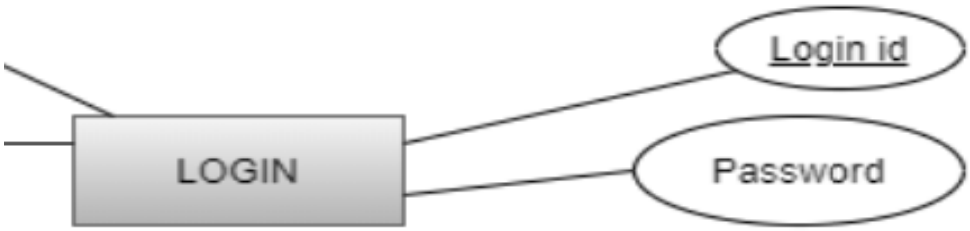


TYPE_ID	**QUANTITY(Number of Units)**
Sy_101	250
Cott_23	250
Nee_90	150
Dett_98	100

5) CONVERTING REPORTS ENTITY TO TABLE

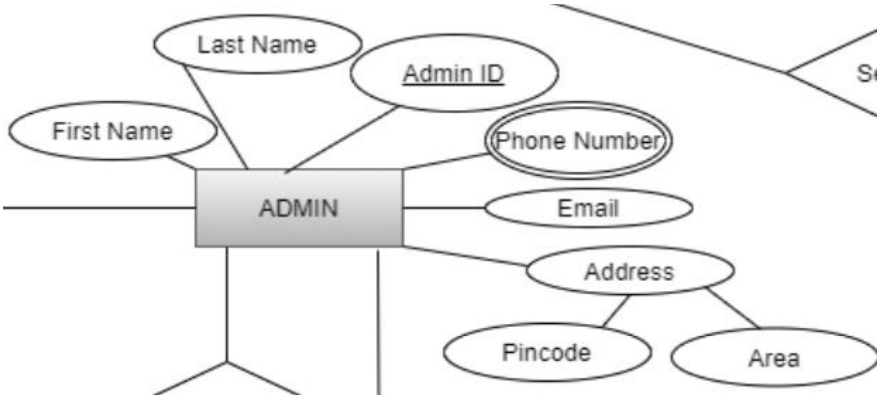
PATIENT ID	**TEST ID**	**DATE OF TEST**	**PERSONAL REPORT**
112890	11BT	11/03/2019	112890_110319BT
175648	121UT	26/09/2018	175648_260918UT
134562	11BT	08/04/2018	134562_080418BT
188756	213MA	19/03/2021	188756_190321MA
188756	121UT	19/03/2021	188756_190321UT
175648	121UT	20/04/2021	175648_200421UT

6) CONVERTING LOGIN ENTITY TO TABLE



LOGIN_ ID	**PASSWORD**
Anan24	12345
Sana_03	89100
AryaS@01	11100
Karan&123	12312
Avinash@R	45678

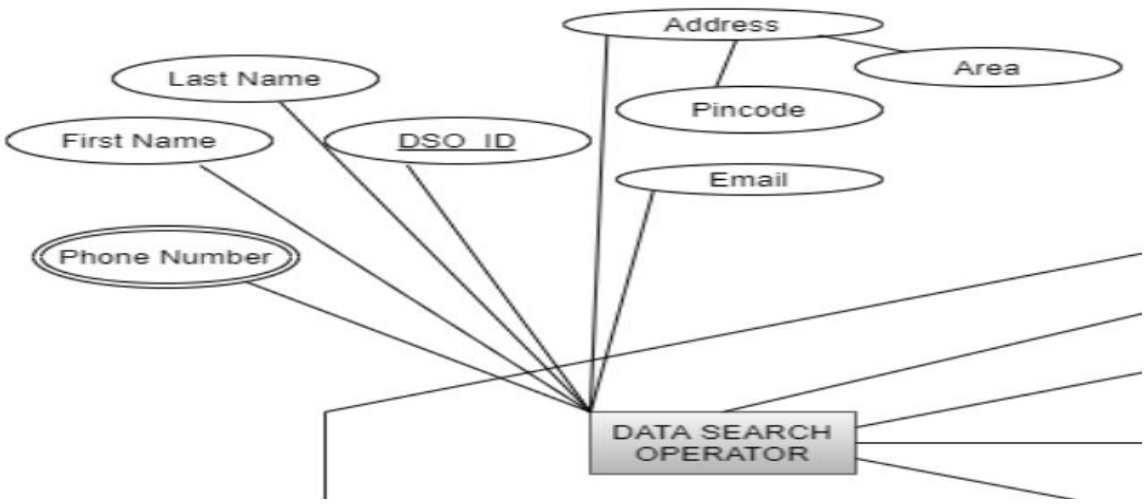
7) CONVERTING ADMIN ENTITY INTO TABLE



ADMIN ID	**FIRST NAME**	**LAST NAME**	**AREA**	**PINCODE**	**EMAIL**
A_89	Raj	Singh	Sec A, Saroj Market Lane	22345	rajsingh_11@gmail.com

ADMIN ID	**PHONE NUMBER**
A_89	8512365147 , 8976890078

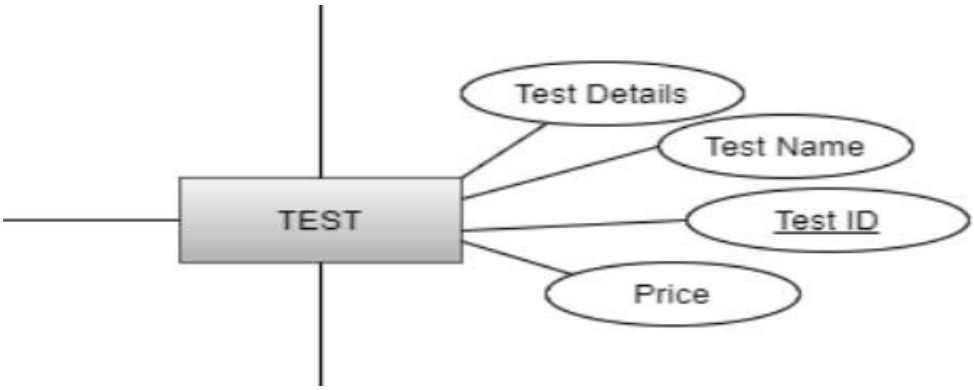
8) CONVERTING DATA SEARCH OPERATOR ENTITY INTO TABLE



DSO_ID	**FIRST NAME**	**LAST NAME**	**ADDRESS**	**PINCODE**	**EMAIL**
D_55	Rahul	Yadav	678,New Colony, Sector A, Aqsaganj	22343	rahul1111@gmail.com

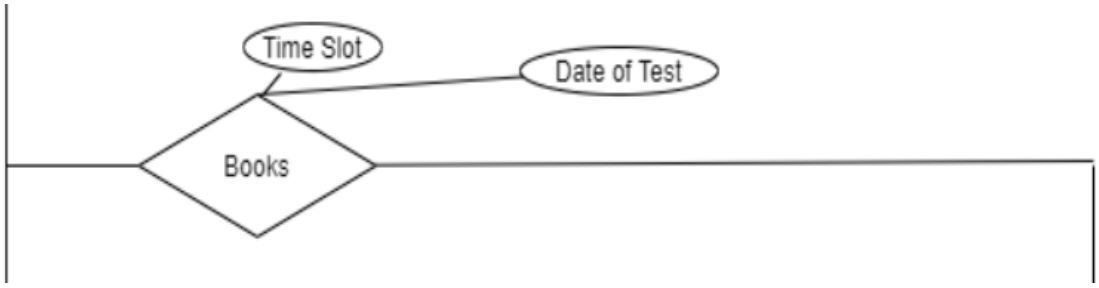
DSO_ID	**PHONE NUMBER**
D_55	7898745693, 7485961236

9) CONVERTING TEST ENTITY INTO TABLE



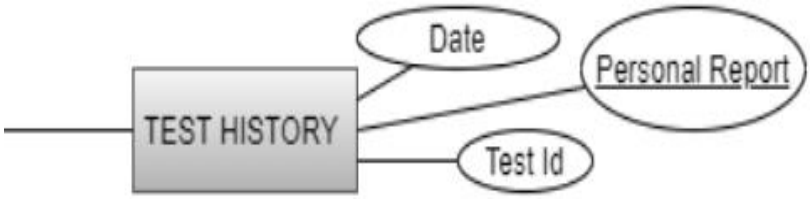
TEST ID	TEST NAME	TEST DETAILS	PRICE
19_CRT	RT-PCR	Covid-19 Detection Test	1170.00
51_SWA	Swasthfit Advance Package	This test includes a total of 51 tests- Glucose Fasting, C-Reactive Protein, Thyroid Profile Total ,Lipid Profile Screen etc.	2599.00
15_SWB	SwasthFit Basic Package	This test includes a total of 15 tests-Urine Examination, Haemogram, Lipid Profile Screen etc.	1399.00
11_BT	Complete Blood Count(CBC)	Blood test used to measure the level of blood count	699.00
15_SWB_CH	SwasthFit Basic Package	This test is for children below 10 years of age. This test includes a total of 15 tests-Urine Examination,Blood Group Detection, Malaria Detection etc.	999.00

10) CONVERTING BOOKS RELATION INTO TABLE



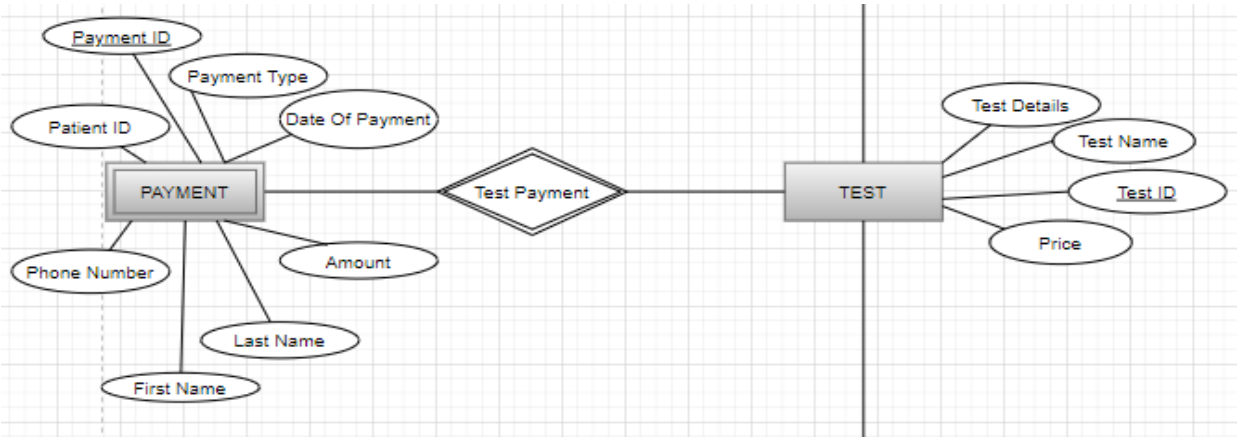
PATIENT ID	FIRST NAME	LAST NAME	PHONE NUMBER	DATE OF TEST	TEST ID	TEST NAME	TIME SLOT
134562	Soumya	Sharma	9887412563	09.10.2019	51_SWA	Swasthfit Advance Package	3.00PM
188769	Ananya	Mittal	8749956789	29.11.2020	15_SWB	SwasthFit Basic Package	12.00PM
178923	Nandini	Gupta	7996840000	18.05.2021	11_BT		9.00AM
188769	Ananya	Mittal	8749956789	20.05.2021	15_SWB	SwasthFit Basic Package	12.00PM
188769	Ananya	Mittal	8749956789	20.05.2021	11_BT	Complete Blood Count(CBC)	02.00PM

11) CONVERTING TEST HISTORY ENTITY INTO TABLE



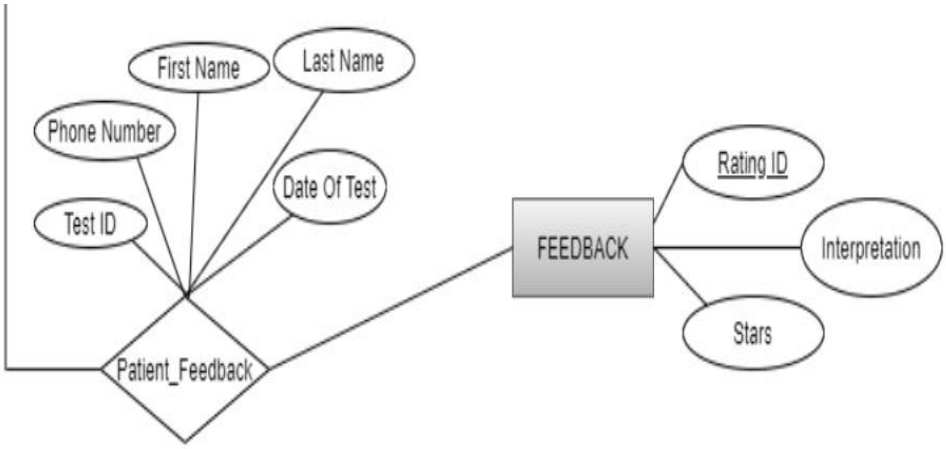
Test_ID	**DATE**	**PERSONAL REPORT**
11_BT	21/09/2019	112890_210919BT
RT_PCR	01/05/2020	112890_010520CR
RT_PCR	17/12/2020	112890_171220CR

12) CONVERTING PAYMENT ENTITY INTO TABLE



PATIENT ID	FIRST NAME	LAST NAME	PHONE NUMBER	DATE OF PAYMENT	PAYMENT ID	PAYMENT TYPE	AMOUNT
188756	Avinash	Rai	9687402153	12.9.2020	478596212	PayTM	4500.00
178923	Nandini	Gupta	7996840000	23.5.2019	304712563	GooglePay	699.00
188756	Avinash	Rai	9687402153	14.04.2021	500102005	Debit Card	799.00
187980	Swati	Pandey	9874863271	05.03.2021	485412471	Debit Card	1199.00
187980	Swati	Pandey	9874863271	05.03.2021	487414010	Debit Card	999.00

13) CONVERTING FEEDBACK ENTITY INTO TABLE



STARS	RATING ID	INTERPRETATION
☆	01	Poor
☆☆	02	Moderate
☆☆☆	03	Satisfactory
☆☆☆☆	04	Very Good
☆☆☆☆☆	05	Excellent

TABLE FOR ‘PATIENT FEEDBACK ’ RELATION

STARS	PATIENT ID	FIRST NAME	LAST NAME	PHONE NUMBER	TEST ID	DATE OF TEST	RATING_ID
☆☆☆	1234	Riya	Yadav	7414785263	51_SWT	12/09/2019	03
☆☆	6577	Meena	Kapoor	7859456325	51_SWT	03/02/2020	02
☆☆☆☆☆	3565	Sana	Singh	8541259636	11_BC	03/02/2020	05
☆☆☆	3565	Sana	Singh	8541259636	15_SWT	03/02/2020	03

NORMALISATION

1NF FORM-

PATIENT – This table contains a multivalued attribute, phone number. So, this is not in 1NF.

PATIENT ID	PHONE NUMBER
188769	8749956789
112890	7859456325
175648	8541259636, 7451263689
134562	9887412563
188756	9687402153
127898	8809745231,7415896257
178923	7996840000
165754	7894512033
187980	9874863271
190023	9874863271

↓CONVERTING TO 1NF

PATIENT ID	PHONE NUMBER
188769	8749956789
112890	7859456325
175648	8541259636
175648	7451263689
134562	9887412563
188756	9687402153
127898	8809745231
127898	7415896257
178923	7996840000
165754	7894512033
187980	9874863271
190023	9874863271

EMPLOYEE – This table contains a multivalued attribute, phone number. So, this is not in 1NF.

EMPLOYEE ID	**PHONE NUMBER**
156	9806788909
134	8471256356, 8956241358
128	9879878540
138	859647125

↓CONVERTING TO 1NF

EMPLOYEE ID	**PHONE NUMBER**
156	9806788909
134	8471256356
134	8956241358
128	9879878540
138	859647125

ADMIN- This table contains a multivalued attribute, phone number. So, this is not in 1NF.

ADMIN ID	**PHONE NUMBER**
A_89	8512365147 , 8976890078

↓CONVERTING TO 1NF

ADMIN ID	**PHONE NUMBER**
A_89	8512365147
A_89	8976890078

DATA SEARCH OPERATOR- This table contains a multivalued attribute, phone number. So, this is not in 1NF.

DSO_ID	**PHONE NUMBER**
D_55	7898745693, 7485961236

↓CONVERTING TO 1NF

DSO_ID	**PHONE NUMBER**
D_55	7898745693
D_55	7485961236

2NF FORM-

BOOKS TABLE-

PATIENT ID	FIRST NAME	LAST NAME	PHONE NUMBER	DATE OF TEST	TEST ID	TEST NAME	TIME SLOT
134562	Soumya	Sharma	9887412563	09.10.2019	51_SWA	Swasthfit Advance Package	3.00PM
188769	Ananya	Mittal	8749956789	29.11.2020	15_SWB	SwasthFit Basic Package	12.00PM
178923	Nandini	Gupta	7996840000	18.05.2021	11_BT	Complete Blood Count(CBC)	9.00AM
188769	Ananya	Mittal	8749956789	20.05.2021	15_SWB	SwasthFit Basic Package	12.00PM
188769	Ananya	Mittal	8749956789	20.05.2021	11_BT	Complete Blood Count(CBC)	02.00PM

Patient_id $\longrightarrow$ {First Name, Last Name}

Test_id $\longrightarrow$ Test Name

Here, the Candidate Key for the table is ={ Patient_Id, Date Of Test, Test Id} .
But we find that Patient Name (i.e First Name and Last Name) can be identified by Patient_Id and Test Name can be identified by Test_Id independently. This is called partial dependency, which is not allowed in Second Normal Form.
So , we will convert this table in second normal form.

PATIENT ID	FIRST NAME	LAST NAME	PHONE NUMBER	DATE OF TEST	TEST ID	TIME SLOT
134562	Soumya	Sharma	9887412563	09.10.2019	51_SWA	3.00PM
188769	Ananya	Mittal	8749956789	29.11.2020	15_SWB	12.00PM
178923	Nandini	Gupta	7996840000	18.05.2021	11_BT	9.00AM
188769	Ananya	Mittal	8749956789	20.05.2021	15_SWB	12.00PM
188769	Ananya	Mittal	8749956789	20.05.2021	11_BT	02.00PM

TEST ID	TEST NAME
51_SWA	Swasthfit Advance Package
15_SWB	SwasthFit Basic Package
11_BT	Complete Blood Count(CBC)
15_SWB	SwasthFit Basic Package
11_BT	Complete Blood Count(CBC)

PATIENT_FEEDBACK TABLE-

STARS	PATIENT ID	FIRST NAME	LAST NAME	PHONE NUMBER	TEST ID	DATE OF TEST	RATING_ID
☆☆☆	1234	Riya	Yadav	7414785263	51_SWT	12/09/2019	03
☆☆	6577	Meena	Kapoor	7859456325	51_SWT	03/02/2020	02
☆☆☆☆☆	3565	Sana	Singh	8541259636	11_BC	03/02/2020	05
☆☆☆	3565	Sana	Singh	8541259636	15_SWT	03/02/2020	03

Patient_id $\longrightarrow$ {First Name, Last Name}

Rating_id $\longrightarrow$ Stars

Here, the Candidate Key for the table is ={ Patient_Id, Date Of Test, Test Id} .

But we find that Patient Name (i.e First Name and Last Name) can be identified by Patient_Id and Stars can be identified by Rating_Id independently. This is called partial dependency, which is not allowed in Second Normal Form.

So , we will convert this table in second normal form.

PATIENT ID	FIRST NAME	LAST NAME	PHONE NUMBER	TEST ID	DATE OF TEST	RATING_ID
1234	Riya	Yadav	7414785263	51_SWT	12/09/2019	03
6577	Meena	Kapoor	7859456325	51_SWT	03/02/2020	02
3565	Sana	Singh	8541259636	11_BC	03/02/2020	05
3565	Sana	Singh	8541259636	15_SWT	03/02/2020	03

STARS	RATING_ID
☆☆☆	03
☆☆	02
☆☆☆☆☆	05
☆☆☆	03

3NF FORM-

PATIENT -

FIRST NAME	LAST NAME	PATIENT ID	DATE OF BIRTH	AREA	CITY	PINCODE	EMAIL
Ananya	Mittal	188769	25/7/1996	32, Road 8, Sec E	Patiala	22345	ananya123@gmail.com
Meena	Kapoor	112890	16/2/1994	234, Sector O, Vikas Puri	Lucknow	23421	meena@gmail.com
Sana	Singh	175648	03/9/1970	34, Himgiri Apartments ,Vaishali Nagar	Lucknow	24356	s_singh3@gmail.com
Soumya	Sharma	134562	28/5/1985	Road 3, Block 10, Sadar Bazaar	Ludhiana	28190	soumya28@gmail.com
Avinash	Rai	188756	12/5/1965	212, Chandralok Aliganj	Patiala	22346	arai_08@gmail.com
Arya	Sharma	127898	08/1/1979	67, Prashant Apartments, Mayur Vihar	Patiala	22367	sharma_a@gmail.com
Nandini	Gupta	178923	12/12/1985	89,Par Apartments, Mayur Vihar	Agra	22435	nandini@gmail.com
Karan	Kapoor	165754	16/2/1994	323, Sohan Colony, Nakasganj	Lucknow	226024	karan_k@gmail.com
Swati	Pandey	187980	03/9/1970	24, Aks Colony, Shahi Nagar	Lucknow	226013	swati09@gmail.com
Ashveka	Pandey	190023	21/07/2011	24, Aks Colony, Shahi Nagar	Lucknow	226024	swati09@gmail.com

Here,

Functional Dependencies are:

Pincode → {Area, City}

Patient_Id → {Pincode}

Here, area and city are dependent on Pincode. And, Pincode is dependent on Patient_id that makes non-prime attributes (area and city) transitively dependent on super key (Patient_Id). This violates the rule of 3NF. To make this table complies with 3NF we have to break the table into two tables to remove the transitive dependency:

FIRST NAME	LAST NAME	PATIENT ID	DATE OF BIRTH	PINCODE	EMAIL
Ananya	Mittal	188769	25/7/1996	22345	ananya123@gmail.com
Meena	Kapoor	112890	16/2/1994	23421	meena@gmail.com
Sana	Singh	175648	03/9/1970	24356	s_singh3@gmail.com
Soumya	Sharma	134562	28/5/1985	28190	soumya28@gmail.com
Avinash	Rai	188756	12/5/1965	22346	arai_08@gmail.com
Arya	Sharma	127898	08/1/1979	22367	sharma_a@gmail.com
Nandini	Gupta	178923	12/12/1985	22435	nandini@gmail.com
Karan	Kapoor	165754	16/2/1994	226024	karan_k@gmail.com
Swati	Pandey	187980	03/9/1970	226013	swati09@gmail.com
Ashveka	Pandey	190023	21/07/2011	226024	swati09@gmail.com

AREA	CITY	PINCODE
Road 8, Sec E	Patiala	22345
Sector O, Vikas Puri	Lucknow	23421
Himgiri Apartments ,Vaishali Nagar	Lucknow	24356
Block 10, Sadar Bazaar	Ludhiana	28190
Chandralok Aliganj	Patiala	22346
Prashant Apartments, Mayur Vihar	Patiala	22367
Prashant Apartments, Mayur Vihar	Agra	22435
Sohan Colony, Nakasganj	Lucknow	226024
Aks Colony, Shahi Nagar	Lucknow	226013
Aks Colony, Shahi Nagar	Lucknow	226024

EMPLOYEE-

EMPLOYEE ID	FIRST NAME	LAST NAME	DATE OF JOINING	AREA	PINCODE	EMAIL
156	Raj	Kumar	15/05/2017	Sec A, Road 10, Behind Children Park	23458	raj@gmail.com
134	Shikhar	Yadav	02/07/2019	Aks Colony, Shahi Nagar	11234	shikhar11@gmail.com
128	Anand	Singh	11/02/2018	Sahu Apartments, Gharaganj	89768	ana_singh@gmail.com
138	Hemant	Kumar	15/05/2017	Niketan Apartments, Vikas Nagar	45324	hemantk@gmail.com

Here,

Functional Dependencies are:

Pincode → {Area }

Employee_Id → {Pincode}

Here, area is dependent on Pincode. And, Pincode is dependent on Employee_id that makes non-prime attribute (Area) transitively dependent on super key (Employee_Id). This violates the rule of 3NF. To make this table complies with 3NF

we have to break the table into two tables to remove the transitive dependency:

EMPLOYEE ID	FIRST NAME	LAST NAME	DATE OF JOINING	PINCODE	EMAIL
156	Raj	Kumar	15/05/2017	23458	raj@gmail.com
134	Shikhar	Yadav	02/07/2019	11234	shikhar11@gmail.com
128	Anand	Singh	11/02/2018	89768	ana_singh@gmail.com
138	Hemant	Kumar	15/05/2017	45324	hemantk@gmail.com

AREA	PINCODE
Sec A, Road 10, Behind Children Park	23458
Aks Colony, Shahi Nagar	11234
Sahu Apartments, Gharaganj	89768
Niketan Apartments, Vikas Nagar	45324

ADMIN-

ADMIN ID	**FIRST NAME**	**LAST NAME**	**AREA**	**PINCODE**	**EMAIL**
A_89	Raj	Singh	32,Sec A, Saroj Market Lane	22345	rajsingh_11@gmail.com

Here,

Functional Dependencies are:

Pincode → {Area }

Admin_Id → {Pincode}

Here, city is dependent on Pincode and Pincode is dependent on Admin_id that makes non-prime attribute (Area) transitively dependent on super key (Admin_Id). This violates the rule of 3NF. To make this table complies with 3NF we have to break the table into two tables to remove the transitive dependency:

ADMIN ID	**FIRST NAME**	**LAST NAME**	**PINCODE**	**EMAIL**
A_89	Raj	Singh	22345	rajsingh_11@gmail.com

AREA	**PINCODE**
Sec A, Saroj Market Lane	22345

DATA SEARCH OPERATOR-

DSO_ID	FIRST NAME	LAST NAME	AREA	PINCODE	EMAIL
D_55	Rahul	Yadav	New Colony, Sector A, Aqsaganj	22343	rahul1111@gmail.com

Here,

Functional Dependencies are:

Pincode → {Address }

DSO_Id → {Pincode}

Here, city is dependent on Pincode and Pincode is dependent on DSO_id that makes non-prime attribute (Area) transitively dependent on super key (DSO_Id). This violates the rule of 3NF. To make this table complies with 3NF we have to break the table into two tables to remove the transitive dependency:

DSO_ID	FIRST NAME	LAST NAME	PINCODE	EMAIL
D_55	Rahul	Yadav	22343	rahul1111@gmail.com

AREA	PINCODE
New Colony, Sector A, Aqsaganj	22343