

ASSIGNMENT 4

Tables in 1st Normal Form (1NF):

Show all tables in 1NF

```
In [133]: 1 # Show head of 'adverse_reaction'
          2 adverse_reaction.head()
```

```
Out[133]:
```

	adverse_reaction_id	adverse_reaction_name
0	1	headache
1	2	nausea
2	3	hypoglycemia
3	4	body pain
4	5	throat irritation

```
In [134]: 1 # Show head of 'patient_adverse_reaction'
          2 patient_adverse_reaction.head()
```

```
Out[134]:
```

	patient_id	adverse_reaction_id
0	225	1
1	225	2
2	242	3
3	242	4
4	345	5

```
In [135]: 1 # Show head of 'patient_clean_data'
          2 patient_clean_data.head()
```

```
Out[135]:
```

	patient_id	assigned_sex	given_name	surname	address	city	state	zip_code	country	birthdate	weight	height	bmi	phone_number	
0	1	female	Zoe	Wellish	576 Brown Bear Drive	Rancho California	CA	92390	United States	10-07-1976	121.7	66	19.6	1.951720e+10	ZoeWell
1	3	male	Jae	Debord	1493 Poling Farm Road	York	NE	68467	United States	19-02-1980	177.8	71	24.8	1.402364e+10	JaeMI
2	4	male	Liêm	Phan	2335 Webster Street	Woodbridge	NJ	70955	United States	26-07-1951	220.9	70	31.7	1.732637e+10	PhanBaLie
3	5	male	Tim	Neudorf	1428 Turkey Pen Lane	Dothan	AL	36303	United States	18-02-1928	192.3	72	26.1	1.334516e+10	Tim
4	6	male	Rafael	Costa	1140 Willis Avenue	Daytona Beach	FL	32114	United States	31-08-1931	183.9	70	26.4	1.386335e+10	RafaelCardos

Tables in 2nd Normal Form (2NF):

Show all tables in 2NF

```
In [136]: 1 # Show patient_clean_data
          2 patient_clean_data.head()
```

```
Out[136]:
```

	patient_id	assigned_sex	given_name	surname	address	city	state	zip_code	country	birthdate	weight	height	bmi	phone_number	
0	1	female	Zoe	Wellish	578 Brown Bear Drive	Rancho California	CA	92390	United States	10-07-1976	121.7	66	19.6	1.951720e+10	ZoeWel
1	3	male	Jae	Debord	1493 Poling Farm Road	York	NE	68467	United States	19-02-1980	177.8	71	24.8	1.402364e+10	JaeMI
2	4	male	Liêm	Phan	2335 Webster Street	Woodbridge	NJ	70955	United States	26-07-1951	220.9	70	31.7	1.732637e+10	PhanBaLie
3	5	male	Tim	Neudorf	1428 Turkey Pen Lane	Dothan	AL	36303	United States	18-02-1928	192.3	72	26.1	1.334516e+10	Tim
4	6	male	Rafael	Costa	1140 Willis Avenue	Daytona Beach	FL	32114	United States	31-08-1931	183.9	70	26.4	1.386335e+10	RafaelCardos

```
In [123]: 1 # Show head of 'patient_adverse_reaction'
          2 patient_adverse_reaction.head()
```

```
Out[123]:
```

	patient_id	adverse_reaction_id
0	225	1
1	225	2
2	242	3
3	242	4
4	345	5

```
In [124]: 1 # Show head of 'adverse_reaction'
          2 adverse_reaction.head()
```

```
Out[124]:
```

	adverse_reaction_id	adverse_reaction_name
0	1	headache
1	2	nausea
2	3	hypoglycemia
3	4	body pain
4	5	throat irritation

```
In [125]: 1 # Show 'treatments_clean_data'
          2 del treatments_clean_data['treatment']
          3 del treatments_clean_data['adverse_reaction']
          4 treatments_clean_data.head()
```

```
Out[125]:
```

	hba1c_start	hba1c_end	hba1c_change	dose	dose_start	dose_end	patient_id
0	7.63	7.20	0.43	41u - 48u	41	48	225
1	7.97	7.62	0.35	33u - 36u	33	36	242
2	7.65	7.27	0.38	37u - 42u	37	42	345
3	7.89	7.55	0.34	31u - 38u	31	38	276
4	7.76	7.37	0.39	30u - 36u	30	36	15

```
In [126]: 1 # Show 'treatment_reaction'
          2 treatment_reaction.head()
```

```
Out[126]:
```

	patient_id	treatment	adverse_reaction
0	225	auralin	cough
1	242	auralin	body pain
2	345	auralin	throat irritation
3	276	auralin	hypoglycemia
4	15	auralin	nausea

Tables in 3rd Normal Form (3NF):

```
In [153]: 1 # Show 'city'
          2 city.head()
```

```
Out[153]:
```

	zip_code	city
0	92390	Rancho California
1	68467	York
2	70955	Woodbridge
3	36303	Dothan
4	32114	Daytona Beach

```
In [152]: 1 # Show 'treatment_reaction'
          2 treatment_reaction.head()
```

```
Out[152]:
```

	patient_id	treatment	adverse_reaction
0	225	auralin	cough
1	242	auralin	body pain
2	345	auralin	throat irritation
3	276	auralin	hypoglycemia
4	15	auralin	nausea

```
In [151]: 1 # Show 'treatments_clean_data'
          2 treatments_clean_data.head()
```

```
Out[151]:
```

	hba1c_start	hba1c_end	hba1c_change	dose	dose_start	dose_end	patient_id
0	7.63	7.20	0.43	41u - 48u	41	48	225
1	7.97	7.62	0.35	33u - 36u	33	36	242
2	7.65	7.27	0.38	37u - 42u	37	42	345
3	7.89	7.55	0.34	31u - 38u	31	38	276
4	7.76	7.37	0.39	30u - 36u	30	36	15

```
In [148]: 1 # Show head of 'patient_adverse_reaction'
          2 patient_adverse_reaction.head()
```

```
Out[148]:
```

	patient_id	adverse_reaction_id
0	225	1
1	225	2
2	242	3
3	242	4
4	345	5

```
In [147]: 1 # Show head of 'adverse_reaction'
          2 adverse_reaction.head()
```

```
Out[147]:
```

	adverse_reaction_id	adverse_reaction_name
0	1	headache
1	2	nausea
2	3	hypoglycemia
3	4	body pain
4	5	throat irritation

```
In [146]: 1 # Show 'patient'
          2 patient_clean_data.head()
```

```
Out[146]:
```

	patient_id	assigned_sex	given_name	surname	address	state	zip_code	country	birthdate	weight	height	bmi	phone_number	email
0	1	female	Zoe	Wellish	576 Brown Bear Drive	CA	92390	United States	10-07-1976	121.7	66	19.6	1.951720e+10	ZoeWellish@superrito
1	3	male	Jae	Debord	1493 Poling Farm Road	NE	68467	United States	19-02-1980	177.8	71	24.8	1.402364e+10	JaeMDebord@gustr
2	4	male	Liêm	Phan	2335 Webster Street	NJ	70955	United States	26-07-1951	220.9	70	31.7	1.732637e+10	PhanBaLiem@jourapide
3	5	male	Tim	Neudorf	1428 Turkey Pen Lane	AL	36303	United States	18-02-1928	192.3	72	26.1	1.334516e+10	TimNeudorf@cuvv
4	6	male	Rafael	Costa	1140 Willis Avenue	FL	32114	United States	31-08-1931	183.9	70	26.4	1.386335e+10	RafaelCardosoCosta@gustr

View for all the use cases:

Which user posted this tweet?

```
123 #Which user posted this tweet?
124 • SELECT Twitter_handle, tweet_text FROM tweets WHERE tweet_id = "1111";
125
126 • DROP VIEW users_tweet;
127 • CREATE VIEW users_tweet AS
128 SELECT tweets.Twitter_handle, tweets.tweet_text
129 FROM tweets
130 JOIN user ON (tweets.Twitter_handle = user.Twitter_handle)
131 WHERE tweet_id = "1111";
132
133 • SELECT * FROM users_tweet;
```

Result Grid	Filter Rows:	Export:	Wrap Cell Content:
Twitter_handle	tweet_text		
@TomFitton	Brigham and Womens Hospital Harvest and sale...		



When did the user post this tweet?

```
135 #When did the user post this tweet?
136 • SELECT Twitter_handle, created_at FROM tweets WHERE Twitter_handle = "@boston25";
137
138 • CREATE VIEW tweet_posted AS
139 SELECT tweets.Twitter_handle, tweets.created_at
140 FROM tweets
141 JOIN tweet_tags ON (tweets.tweet_id = tweet_tags.tweet_id)
142 WHERE Twitter_handle = "@boston25";
143
144 • SELECT * FROM tweet_posted;
```

Result Grid	Filter Rows:	Export:	Wrap Cell Content:
Twitter_handle	created_at		
@boston25	2022-11-23 06:45:00		



What tweet has the user posted in last 24 hours?

```
146 #What tweet has the user posted in last 24 hours?
147 • SELECT * FROM tweets WHERE Twitter_handle = "@TomFitton" AND created_at > '2022-11-22 10:05:10';
148
149 • CREATE VIEW posted_tweet AS
150 SELECT tweets.tweet_id, tweets.Twitter_handle, tweets.created_at
151 FROM tweets
152 JOIN tweet_tags ON (tweets.tweet_id = tweet_tags.tweet_id)
153 WHERE Twitter_handle = '@TomFitton' AND created_at > '2022-11-22 10:05:10';
154
155 • SELECT * FROM posted_tweet;
```

Result Grid	Filter Rows:	Export:	Wrap Cell Content:
tweet_id	Twitter_handle	created_at	
1111	@TomFitton	2022-11-23 00:00:00	



How many users have followers more than 3 Million?

```
169 #How many users have followers more than 3 Million?
170 • SELECT DISTINCT(name), Twitter_handle, followers_count FROM user WHERE followers_count > 3000000;
171
172 • CREATE VIEW twitter_followers AS
173 SELECT DISTINCT(user.name), user.Twitter_handle, user.followers_count
174 FROM user
175 JOIN tweets ON (user.Twitter_handle = tweets.Twitter_handle)
176 WHERE followers_count > 3000000;
177
178 • SELECT * FROM twitter_followers;
```

Result Grid

	name	Twitter_handle	followers_count
▶	Tom Fitton	@TomFitton	3320060
	Boston 25 News	@boston25	3634000

Result Grid

Are there any users who mentioned about Womens Hospital?

```
180 #Are there any users who mentioned about Womens Hospital?
181 • SELECT * FROM tweets WHERE tweet_text LIKE '%Womens Hospital%';
182
183 • DROP VIEW user_tweets;
184 • CREATE VIEW user_tweets AS
185 SELECT tweets.tweet_id, tweets.Twitter_handle, tweets.tweet_text
186 FROM tweets
187 JOIN user ON (tweets.Twitter_handle = user.Twitter_handle)
188 WHERE tweets.tweet_text LIKE '%Womens Hospital%';
189
190 • SELECT * FROM user_tweets;
```

Result Grid

	tweet_id	Twitter_handle	tweet_text
▶	1111	@TomFitton	Brigham and Womens Hospital Harvest and sale...
	2112	@bostonherald	Shingles is tied to a higher long-term risk of a m...
	3564	@boston25	An employee at Brigham and Womens Hospital ...
	4895	@HarvardSchool01	This integration is really something thats never ...

Result Grid

Which doctor is a male dermat specialist?

```
203 #Which doctor is a male dermat specialist?
204 • SELECT * FROM doctor WHERE doctor_speciality = 'Dermatology' AND doctor_gender = 'Male';
205
206 • CREATE VIEW doctor_appointments AS
207 SELECT doctor.doctor_id, doctor.doctor_speciality, doctor.doctor_gender
208 FROM doctor
209 JOIN twitter_appointment ON (doctor.appointment_id = twitter_appointment.appointment_id)
210 WHERE doctor_speciality = 'Dermatology' AND doctor_gender = 'Male';
211
212 • SELECT * FROM doctor_appointments;
```

Result Grid

	doctor_id	doctor_speciality	doctor_gender
▶	701	Dermatology	Male

Result Grid

Which appointments are booked in last 3 months?

```
214 #Which appointments are booked in last 3 months?
215 • SELECT * FROM twitter_appointment WHERE appointment_date > '2022-07-01';
216
217 • CREATE VIEW booked_appointments AS
218 SELECT twitter_appointment.appointment_id, twitter_appointment.appointment_date
219 FROM twitter_appointment
220 JOIN doctor ON (twitter_appointment.appointment_id = doctor.appointment_id)
221 WHERE appointment_date > '2022-07-01';
222
223 • SELECT * FROM booked_appointments;
```

Result Grid	Filter Rows:	Export:	Wrap Cell Content:
appointment_id	appointment_date		
10011	2022-10-22		
10022	2022-11-17		
10033	2022-09-10		
10044	2022-08-19		

How many different speciality doctors are present?

```
236 #How many different speciality doctors are present?
237 • SELECT DISTINCT(doctor_speciality), doctor_name, doctor_location FROM doctor;
238
239 • DROP VIEW doctors_speciality;
240 • CREATE VIEW doctors_speciality AS
241 SELECT DISTINCT(doctor.doctor_speciality), doctor.doctor_name, doctor.doctor_location
242 FROM doctor
243 JOIN twitter_appointment ON (doctor.appointment_id = twitter_appointment.appointment_id);
244
245 • SELECT * FROM doctors_speciality;
```

Result Grid	Filter Rows:	Export:	Wrap Cell Content:
doctor_speciality	doctor_name	doctor_location	
Dermatology	Deepak L. Bhatt	Boston	
Anesthesiology	Pinak Shah	New York	
Emergency medicine	Nathan Connell	Cambridge	
Diagnostic radiology	Sarah Cuddy	Waltham	

How many Female doctors are there in the hospital?

```
247 #How many Female doctors are there in the hospital?
248 • SELECT DISTINCT(doctor_gender) , doctor_name FROM doctor WHERE doctor_gender = "Female";
249
250 • CREATE VIEW doctor_genders AS
251 SELECT DISTINCT(doctor.doctor_gender), doctor.doctor_name
252 FROM doctor
253 JOIN twitter_appointment ON (doctor.appointment_id = twitter_appointment.appointment_id)
254 WHERE doctor_gender = 'Female';
255
256 • SELECT * FROM doctor_genders;
```

Result Grid	Filter Rows:	Export:	Wrap Cell Content:
doctor_gender	doctor_name		
Female	Sarah Cuddy		

How many Male patients are there?

```
269 #How many Male patients are there?
270 • SELECT DISTINCT(assigned_sex) , given_name FROM patients WHERE assigned_sex = "Male";
271
272 • CREATE VIEW patients_gender AS
273 SELECT DISTINCT(patients.assigned_sex), patients.given_name
274 FROM patients
275 JOIN treatments ON (patients.patient_id = treatments.patient_id)
276 WHERE assigned_sex = 'Male';
277
278 • SELECT * FROM patients_gender;
```

Result Grid

	assigned_sex	given_name
▶	male	Eddie

Result Grid

How many patients have hypoglycemia as adverse reaction?

```
280 #How many patients have hypoglycemia as adverse reaction?
281 • SELECT * FROM adverse_reactions WHERE adverse_reaction = 'hypoglycemia';
282
283 • CREATE VIEW patient_reactions AS
284 SELECT adverse_reactions.reaction_id, adverse_reactions.given_name, adverse_reactions.adverse_reaction
285 FROM adverse_reactions
286 JOIN treatments ON (adverse_reactions.patient_id = treatments.patient_id)
287 WHERE adverse_reaction = 'hypoglycemia';
288
289 • SELECT * FROM patient_reactions;
```

Result Grid

	reaction_id	given_name	adverse_reaction
▶	801	lena	hypoglycemia

Result Grid

How many Female patients are there?

```
291 #How many Female patients are there?
292 • SELECT DISTINCT(assigned_sex) , given_name FROM patients WHERE assigned_sex = "Female";
293
294 • CREATE VIEW patient_gender AS
295 SELECT DISTINCT(patients.assigned_sex), patients.given_name
296 FROM patients
297 JOIN treatments ON (patients.patient_id = treatments.patient_id)
298 WHERE assigned_sex = 'Female';
299
300 • SELECT * FROM patient_gender;
```

Result Grid

	assigned_sex	given_name
▶	female	Asia
	female	Lena
	female	Veronika
	female	Skye
	female	Sophia

Result Grid

Name the people who are treated with auralin?

```
302 #Name the people who are treated with auralin?
303 • SELECT DISTINCT(treatment) , given_name FROM treatments WHERE treatment = "auralin";
304
305 • CREATE VIEW patient_treatment AS
306 SELECT DISTINCT(treatments.treatment), treatments.given_name
307 FROM treatments
308 JOIN adverse_reactions ON (treatments.patient_id = adverse_reactions.patient_id)
309 WHERE treatment = 'auralin';
310
311 • SELECT * FROM patient_treatment;
312
```

Result Grid Filter Rows: Export: Wrap Cell Content:

	patient_id	given_name	birthdate
▶	15	Asia	8/15/1997
	128	Lena	11/10/1977
	276	Eddie	7/17/1982
	345	Sophia	6/4/1939
	403	Manouck	11/3/1964

Result Grid

Which patients birthdates are after 1/20/1934?

```
311 • SELECT * FROM patient_treatment;
312
313 #Which patients birthdates are after 1/20/1934?
314 • SELECT * FROM patients WHERE birthdate > '1/20/1934';
315
316 • CREATE VIEW patient_birthdate AS
317 SELECT patients.patient_id, patients.given_name, patients.birthdate
318 FROM patients
319 JOIN treatments ON (patients.patient_id = treatments.patient_id)
320 WHERE birthdate > '1/20/1934';
321
322 • SELECT * FROM patient_birthdate;
323
```

Result Grid Filter Rows: Export: Wrap Cell Content:

	patient_id	given_name	birthdate
▶	15	Asia	8/15/1997
	128	Lena	11/10/1977
	276	Eddie	7/17/1982
	345	Sophia	6/4/1939
	403	Manouck	11/3/1964

Result Grid

How many Male doctors are there in the hospital?

```
324 #How many Male doctors are there in the hospital?
325 • SELECT DISTINCT(doctor_gender) , doctor_name FROM doctor WHERE doctor_gender = "Male";
326
327 • DROP VIEW doctors_gender;
328 • CREATE VIEW doctors_gender AS
329 SELECT DISTINCT(doctor.doctor_gender), doctor.doctor_name
330 FROM doctor
331 JOIN twitter_appointment ON (doctor.appointment_id = twitter_appointment.appointment_id)
332 WHERE doctor_gender = 'Male';
333
334 • SELECT * FROM doctors_gender;
```

doctor_gender	doctor_name
Male	Deepak L. Bhatt
Male	Pinak Shah
Male	Nathan Connell

#Which doctor is a Female Diagnostic radiology specialist?

```
336 #Which doctor is a Female Diagnostic radiology specialist?
337 • SELECT * FROM doctor WHERE doctor_speciality = 'Diagnostic radiology' AND doctor_gender = 'Female';
338
339 • DROP VIEW doctor_appoitment;
340 • CREATE VIEW doctor_appoitment AS
341 SELECT doctor.doctor_id, doctor.doctor_speciality, doctor.doctor_gender
342 FROM doctor
343 JOIN twitter_appointment ON (doctor.appointment_id = twitter_appointment.appointment_id)
344 WHERE doctor_speciality = 'Diagnostic radiology' AND doctor_gender = 'Female';
345
346 • SELECT * FROM doctor_appoitment;
```

doctor_id	doctor_speciality	doctor_gender
704	Diagnostic radiology	Female