Derek Tallent
Drt140030@utd.edu

Green Apple Healthcare Database Project

Derek Tallent

Drt140030

BUAN 6320.005

Derek Tallent
Drt140030@utd.edu

Executive Summary

The following are objectives based on problems outlined in the assignment:

- Need to create a better way to schedule nurses through enterprise system (so that it does not have to be manually done).
- Shifts worked along with nurse salaries need to be tracked in order to easily derive check amounts to take pressure off of head nurse having to calculat by hand.
- Need to make sure all rooms and patients are covered by nurses in shift assignments.
- Need to track patients, departments, and rooms to help smooth out hospital day to day operations
- Have to be able to track important nurse, patient, and department data for reporting purposes.

Business Rules

The following are the business rules that must be followed when creating the database:

- Each nurse must have a night shift at least once a month (shift number = 3)
- There are 42 Nurses both Male and Female working at most 3 days a week
- Each nurse has a NurseID, first name, middle initial, last name, email address, gender, salary, and phone number
- NurseID, first name, last name, phone number, and email cannot be null.
- Each Nurse ID must be between 0000000 and 9999999
- Each Nurse Phone Number must be between 000-000-0000 and 999-999-9999
- Each Nurse's email address must be firstname.lastname@greenapphealth.com (Example: Adam.Smith@greenapphealth.com)
- Each Shift has a ShiftID, Shift_Date, Shift_Number(described below), nurse_id, pat_ID1,Pat_ID2,Pat_ID3
- ShiftID, Shift_Date, Shift_Number,Nurse_ID, and Pat_ID1 cannot be null.
- Each ShiftID describes a shift for only one nurse, but there can be multiple ShiftIDs for each shift date and number (there may be more than one nurse working at the same time)
- Each day has three 8 hour shifts: Morning Shift (8:00am-4:00pm), Afternoon Shift (4:00pm-12:00am), and night shift (12:00am-8:00am) identified by one shift number(1,2,3 respectively).

Derek Tallent
Drt140030@utd.edu

- Shift ID must be a number between 00000000 and 99999999
- Each nurse must be assigned to one or more patients per shift, but a patient will only be assigned 1 nurse.
- Each nurse cannot be assigned to more than 3 patients per shift.
- Each patient must be assigned on a shift.
- Nurses can be assigned to up to two shifts on the same day, but may also not be assigned a shift at all on a particular day.
- Each room holds 1 patient, and a patient only has one room at a time
- Each patient has a first name, last name, patientID, gender, arrival date, birth date, room number, and insurance company ID (optional).
- PatientID, first name, last name, gender, arrival date, room number, and department ID must not be null.
- PatientID must be a number between 11111 and 99999
- Each nurse is responsible for multiple rooms (per shift), but each room only has one nurse.
- Each room has a room number and DepartmentID
- Room number and DepartmentID cannot be null
- Room number can only be a number between 1-100
- Each Department must have a Department ID and a Department Name
- There are 4 department names: Intensive Care, Emergency, Maternal Ward, and Surgical
- Department ID corresponds to each Department Name above (Dept_0001 = Intensive care, for example)
- Nurses can be scheduled to multiple departments, and departments can have multiple nurses scheduled.
- Each department has multiple rooms, but each room belongs to only one department.
- Nurses are paid checks which are based on shifts worked times nurse salary
- Checks must have a Check ID, Nurse ID and Shifts Worked (None of these can be null).
- Check ID is a number between 0000000000 and 9999999999.

Added after Normalization:

- Green Apple Healthcare only currently accepts insurance from the following companies: Aetna, Blue Cross Blue Shield, Cigna, Wellcare, United Healthcare, and Humana. If no

Derek Tallent
Drt140030@utd.edu

insurance or company is different from the above, Value will be null in database for insur_company.

- Each Insurance_Company name corresponds to a Insurance_Company ID (Company_0001 = Aetna for example).

ERD Components

Entities

1. Nurses
2. Departments
3. Checks
4. Rooms
5. Patients
6. Shifts

Added after Normalization:

7. Insurance Company

Attributes

1. Nurse Attributes:
    - Nurse ID (0000000-9999999)
    - First Name
    - Last Name
    - Middle Initial
    - Gender
    - Phone Number (000-000-0000 to 999-999-9999)
    - Email Address (lastname.firstname@greenapphealth.com)
    - Birth date
    - Salary
2. Department Attributes:
    - Department ID
    - Department Name
3. Check Attributes:
    - Check ID
    - Nurse ID

Derek Tallent
Drt140030@utd.edu

- Amount Earned

4. Room Attributes:
    - Room Number (1-100)
    - Department belonged to (Department ID)
5. Patient Attributes:
    - First Name
    - Last Name
    - Middle Initial
    - Room Number
    - Gender
    - Birth Date
    - Arrival Date

The Following was changed during normalization

- Has Insurance? (Y or N)
- Insurance company (If Y)

To:

- Insurance_Company_ID

6. Shift Attributes:
    - Shift ID
    - Shift Number
    - Shift Date
    - Nurse ID
    - Patient ID1
    - Patient ID2
    - Patient ID3

Added After Normalization:

7. Insurance Company Attributes:
    - Insurance_Company_ID
    - Company_Name

Derek Tallent
Drt140030@utd.edu

Relationships

- Nurses assigned to 1 Departments (at a time), and Departments can contain no or multiple nurses.
- Nurses receive checks, and checks are received by Nurses
- Nurses are assigned to Rooms, Rooms may or may not be assigned to Nurses
- Nurse cares for one or more patients (per shift), but patients are cared for by only one nurse (per shift).
- Nurse is assigned one shift (at a time), a shift is assigned to only one nurse (at a time)
- Departments contains multiple rooms, each room is in only one department
- Checks are derived from shifts, shifts worked appear on checks
- Each patient is in a room, and each room may or may not contain a patient
- Each shift lists multiple rooms, but each room will only be listed on the shift once (or may not be listed at all).
- Each patient is assigned at least once on a shift, each shift assigns one or more patients

After Normalization:

- Each patient is insured by at most one insurance company (optional), each insurance company insures multiple patients

Cardinalities

Nurse->Departments 0:M- Nurse is only assigned to one department at a time (if any), but departments can have more than one nurse.

Nurse->Check 1:1- Each nurse receives one check at a time, and each check belongs to only one nurse.

Nurse->Room 1:M- Each nurse works in more than one room, but each room only has one nurse.

Nurse->Patient 1:M- Each nurse has multiple patients, but each patient only has one nurse.

Nurse->Shift 1:1- Each nurse is assigned one shift at a time, and each shift is only assigned to one nurse at a time.

Departments->Room 1:M- Each department has multiple rooms, but each room belongs to only one department.

Derek Tallent
Drt140030@utd.edu

Departments->Patient 0:M- Each department may have no or multiple patients, but each patient may only be in one department at a time.

Departments->Shifts 1:M- Each department is on multiple shifts, and each shift lists at least one or multiple departments.

Patient->Room 1:1- Each room only has 1 patient at a time, and each patient only has 1 room at a time.

Check->Shifts 1:M- Each check is derived from multiple shifts, but each shift is only on one check.

Shifts->Rooms M:M- Each room is on multiple shifts, and each shift has multiple rooms.

Added After Normalization:

Insurance_Company->Patient 0:M- Insurance company insures multiple patients, each patient only insured by one (or no) insurance companies.

Keys

Primary Keys:

Nurse ID

Shift ID

Patient ID

Room #

Department_ID

Check ID

After Normalization:

Insurance_Company ID

Foreign Keys:

Nurse ID is a foreign key In Patient, Check, and Shift Tables

Patient ID (1,2,or 3) is a foreign key in Shift Table

Room # is a foreign key in Patient and Shift Tables

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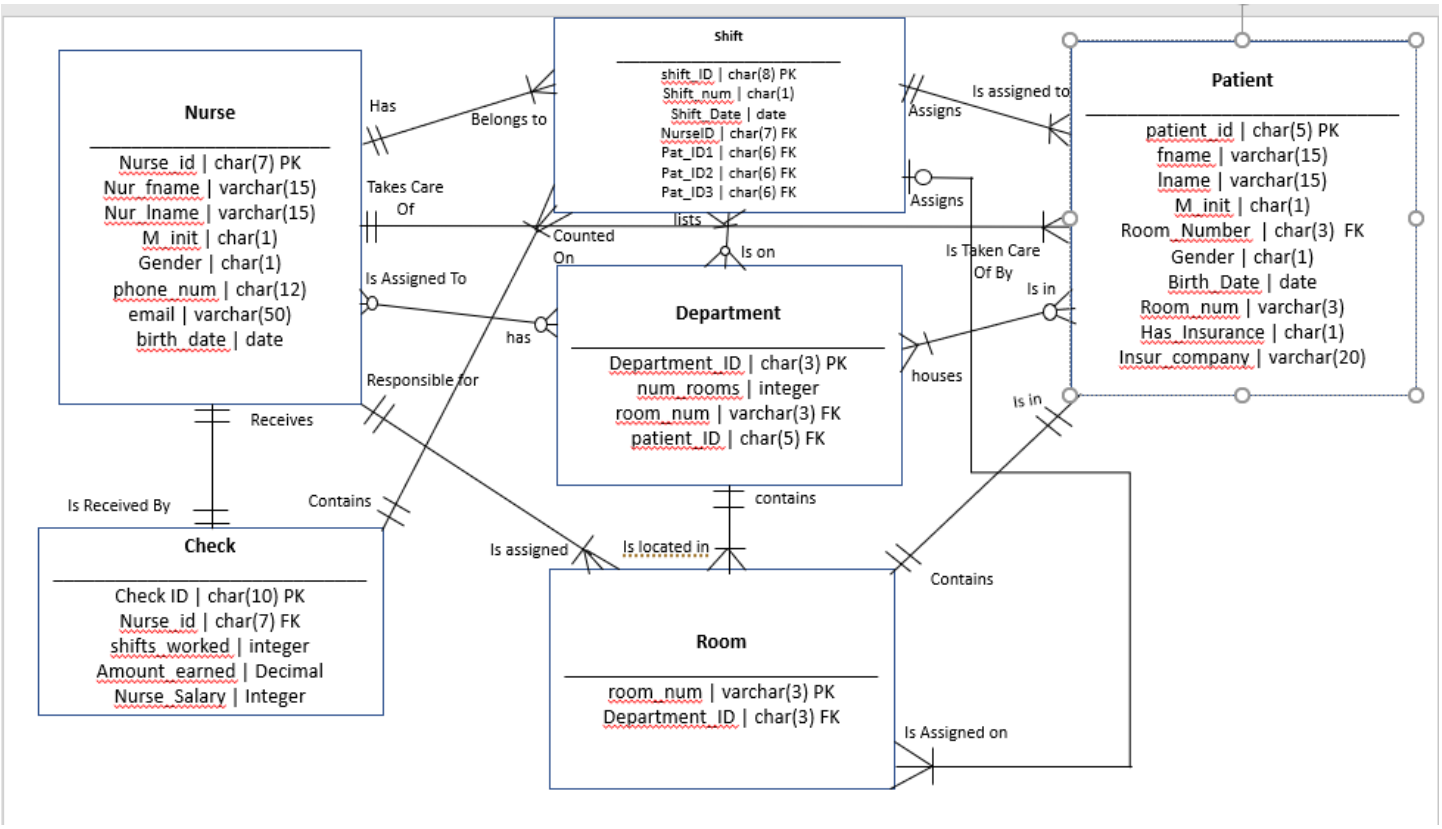
Drt140030@utd.edu

Department_ID is a foreign key in Patient, Shift, and Room Tables

After Normalization:

Insurance_Company_ID is a foreign key in Patient Table

ERD Diagram (Pre-Normalization)



1NF

In order to put the tables in 1NF, I filled all null values, removed repeating groups, and ensured that all attributes were not atomic. The last names of the patient and nurse were atomic because the middle initial could be separated, so that was added to the table to make that attribute no longer atomic.

Key = Primary

Key = Foreign

Nurse_id	nur_	nur_	nur_	nur_	nur_	nur_	nur_	nur_

Derek Tallent
Drt140030@utd.edu

	fname	lname	minit	birthdate	gender	salary	phone_number	email

Shift_ID	nurse_id	Pat_Id1	Pat_Id2	Pat_ID3	room_num	shift_date	shift_num
	department_id						

department_id	Department_Name

patient_id	Department_id	room_num	pat_fname	pat_minit	pat_lname	pat_gender	pat_birth_date	pat_arrival_date	has_insurance	insur_company

check_id	nurse_id	shifts_worked	check_nurse_salary	amount_earned

department_id	department_name

1NF Table Dependencies

a. Partial Dependencies:
   Since there is no composite primary keys, we would not have any partial dependencies. Which means the tables would all be in 2NF.

Nurse_id	Nur_fname	Nur_lname	nur_minit	nur_birthdate	nur_gender	nur_salary	nur_phone_number	nur_email

Shift_ID	Shift_Date	Shift_num	nurse_id	Pat_Id1	Pat_id2	Pat_id3

department_id	Department_Name

room_num		nurse_id	department_id	

Derek Tallent
Drt140030@utd.edu

patient_id	Department_id	Room_num	pat_fname	pat_minit	pat_lname	pat_gender
pat_arrival_date	has_insurance	insur_company				

check_id	nurse_id	shifts_worked	nurse_salary	Amount_Earned

2NF Tables

b. The following are transitive dependencies in the 2NF Tables:

Nurse_id	Nur_fname	Nur_lname	nur_minit	nur_birthdate	nur_gender	nur_salary	nur_phone_number	nur_email

Shift_ID	Shift_Date	Shift_num	nurse_id	Pat_Id1	Pat_id2	Pat_id3

room_num	department_id	

patient_id	Department_id	Room_num	pat_fname	pat_minit	pat_lname	pat_gender
pat_arrival_date	has_insurance	insur_company				

check_id	nurse_id	shifts_worked	nurse_salary	Amount_Earned

3NF

There is some transitive dependencies in the 2NF Tables. The first transitive dependency is in the check table, where amount earned is dependent on both shifts_worked and nurse_salary. To fix this, I moved salary to the nurses table, as it corresponds to the nurse ID anyway. I then removed shifts_worked, as that could more easily be calculated in SQL (my shift table already contains a nurse_ID foreign key). There would now be no transitive dependencies in the check table.

Derek Tallent
Drt140030@utd.edu

There is another transitive dependency in the patient table between has_insurance and insurance_company. To fix this, I created a new insurance company table with an insurance company ID corresponding to each insurance company. I then added an insurance company foreign key to the patient table so that the patient's insurance company will still be listed, but there are no longer any transitive dependencies in the tables, making them all in 3NF:

Nurse_id	nur_ fname	nur_ lname	nur_ minit	nur_ birthdate	nur_ gende r	nur_ phone_ number	nur_emai l	nur_sa lary

Shift_ID	Shift _Date	Shift _num	nurse_id	Pat _Id1	Pat _id2	Pat _id3

room_num	department_id

patient_id	Department _id	Insur_Company_ID	Room_num	pat_fname	pat_minit	pat_lname	
pat_arrival_date	pat_gender						

check_id	nurse_id	check_amount_earned

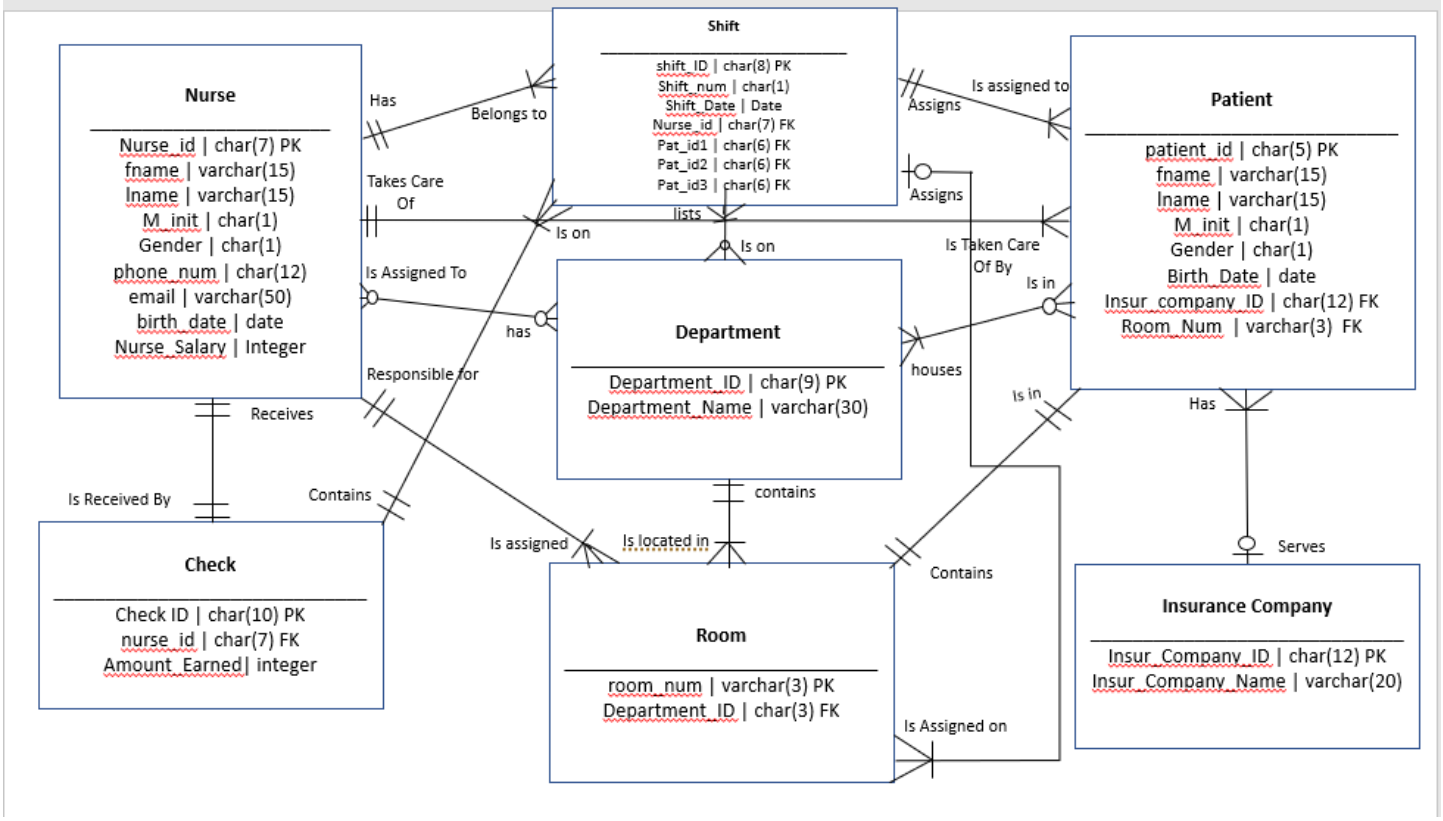
Insur_company_ID	Insur_company

BCNF

There are no functional dependencies where a prime attribute is dependent on a non-primary attribute, so the table is already in BCNF Form.

Derek Tallent
Drt140030@utd.edu

ERD Diagram (Post-Normalization)



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Drt140030@utd.edu

Data Manipulation Tables

a. Patient Table:

	Pat_ID	pat_fname	pat_minit	pat_lname	arrival_date	pat_birth_date	Insur_Company_ID	room_num	gender
1	125268	Maxwell	D	Fuentes	2019-08-26	1949-08-18	Company_0006	24	M
2	170210	Maison	C	Gordon	2019-07-09	1963-05-24	Company_0001	59	M
3	174563	Katie	J	Firth	2019-12-26	1953-06-08	Company_0006	75	F
4	199241	Taliyah	O	Everett	2019-10-03	1955-06-06	NULL	8	F
5	243227	Brent	D	Davies	2019-08-09	1956-12-05	Company_0006	41	M
6	278410	Blake	S	Hamer	2019-12-11	1956-04-30	NULL	58	M
7	286850	Zaynah	W	Maldonado	2019-09-28	1978-12-18	Company_0004	14	F
8	293752	Tyriq	P	Craig	2019-08-27	1972-07-12	NULL	1	M
9	334693	Ayah	L	Howe	2019-10-17	1955-03-30	Company_0003	78	F
10	340002	Giorgio	M	Whyte	2019-12-30	1998-07-21	Company_0003	51	M
11	345834	Jordanne	K	Dalby	2019-12-18	1975-05-01	Company_0005	33	F
12	451458	Ridwan	W	Buck	2019-09-29	1969-10-06	Company_0001	54	M
13	460778	Arooj	D	Ross	2019-07-11	1946-03-03	Company_0003	11	M
14	461215	Alyssa	M	Bean	2019-12-25	1952-10-29	Company_0006	17	F
15	467011	Zakary	A	Richard	2019-07-29	1977-11-11	Company_0003	48	M
16	490983	Diya	A	Lloyd	2019-12-20	2001-03-05	Company_0002	99	F
17	535697	Alysia	W	Lovell	2019-11-15	1948-05-05	Company_0006	39	F
18	627535	Duke	F	Parsons	2019-10-26	1946-05-31	Company_0006	83	M
19	640994	Rafe	F	Hensley	2019-07-30	1963-05-12	Company_0003	21	M
20	701517	Aislinn	K	Rennie	2019-10-25	1996-06-20	Company_0003	20	F
21	729881	Judy	G	Pearson	2019-07-12	1986-12-12	Company_0004	13	M
22	738306	Nisha	P	Yates	2019-10-04	1952-02-26	Company_0003	100	F
23	767694	Aayush	L	Greaves	2019-12-28	1976-04-09	NULL	30	M
24	781264	Kaelan	H	Armstrong	2019-11-30	1945-09-02	Company_0004	27	M
25	868775	Kit	D	Dickinson	2019-09-22	1983-12-19	Company_0003	53	M
26	884634	Amy-Lei...	A	Jacobson	2019-12-24	1955-09-20	Company_0006	49	F
27	919411	Donte	P	Graham	2019-10-08	1995-01-22	Company_0004	18	M
28	962035	Cydney	Y	Barker	2019-12-24	1948-03-03	Company_0004	9	F
29	988793	Jordana	P	Alexander	2019-11-07	1946-04-12	Company_0005	80	F

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Drt140030@utd.edu

Nurse Table

Results | Messages

	Nurse_ID	nur_fname	nur_minit	nur_lname	Gender	phone_num	email	birth_date	salary
1	1130040	Lewys	D	Ramos	F	(275) 068-9290	Lewys.Ramos@greensapphesalth.com	1980-02-03	240
2	1393118	Oakley	R	Romero	F	(545) 371-2210	Oakley.Romero@greensapphesalth.com	1981-01-18	264
3	2108289	Alysia	R	Arias	F	(906) 147-0179	Alysia.Arias@greensapphesalth.com	1980-11-02	264
4	2227289	Belinda	T	Harmon	F	(969) 492-9344	Belinda.Harmon@greensapphesalth.com	1992-03-10	216
5	2472220	Kristen	L	Calderon	F	(596) 054-1233	Kristen.Calderon@greensapphesalth.com	1989-11-28	216
6	2490466	Samuel	J	Zavala	M	(345) 553-6983	Samuel.Zavala@greensapphesalth.com	1992-11-14	216
7	3347905	Ariah	K	Tapia	F	(969) 379-9575	Ariah.Tapia@greensapphesalth.com	1994-07-22	252
8	3490652	Bartosz	Y	Mcgee	M	(980) 680-4528	Bartosz.Mcgee@greensapphesalth.com	1982-10-14	228
9	3523246	Brianna	A	Ho	F	(186) 843-1278	Brianna.Ho@greensapphesalth.com	1982-06-16	216
10	3867008	Tyla	A	Fields	F	(922) 614-2961	Tyla.Fields@greensapphesalth.com	1987-09-16	252
11	4063164	Yasmeen	W	Mackay	F	(830) 438-3556	Yasmeen.Mackay@greensapphesalth.com	1990-02-23	252
12	4772890	Ainsley	I	Preston	F	(637) 928-4039	Ainsley.Preston@greensapphesalth.com	1987-01-14	216
13	4857463	Serenity	R	Brett	F	(803) 863-3057	Serenity.Brett@greensapphesalth.com	1990-12-10	228
14	5280044	Star	P	Higgs	F	(773) 928-6557	Star.Higgs@greensapphesalth.com	1990-06-23	240
15	5732150	Samanta	P	Wilcox	F	(795) 877-7754	Samanta.Wilcox@greensapphesalth.com	1988-12-08	240
16	5846902	Eboni	D	Diaz	F	(569) 065-2174	Eboni.Diaz@greensapphesalth.com	1988-12-22	252
17	5996332	Marian	V	Joyner	F	(470) 923-1718	Marian.Joyner@greensapphesalth.com	1988-01-06	228
18	5996414	Sulaiman	F	Redmond	M	(487) 436-3293	Sulaiman.Redmond@greensapphesalth.c...	1993-06-25	252
19	7158607	Trey	M	Welch	M	(378) 602-9465	Trey.Welch@greensapphesalth.com	1990-10-14	240
20	7306571	Prince	W	Edwards	M	(745) 131-6492	Prince.Edwards@greensapphesalth.com	1981-11-14	252
21	7368261	Yasmine	C	Wood	F	(678) 286-7851	Yasmine.Wood@greensapphesalth.com	1987-02-28	240
22	7689047	Adeline	A	Nolan	F	(779) 289-3883	Adeline.Nolan@greensapphesalth.com	1981-12-09	228
23	7791000	Elly	L	Wills	F	(612) 497-7440	Elly.Wills@greensapphesalth.com	1987-07-28	216
24	7794310	Nishat	O	Houston	M	(696) 457-5326	Nishat.Houston@greensapphesalth.com	1982-01-27	264
25	7809097	Callie	I	Terrell	F	(430) 543-6956	Callie.Terrell@greensapphesalth.com	1992-01-08	264
26	7831983	India	F	Adkins	F	(269) 584-0808	India.Adkins@greensapphesalth.com	1981-01-27	228
27	8017808	Parris	Q	Lott	F	(941) 448-6686	Parris.Lott@greensapphesalth.com	1994-05-30	264
28	8095221	Billie	Z	Piper	F	(744) 857-7201	Billie.Piper@greensapphesalth.com	1985-11-26	228
29	8821167	Noah	D	Fox	M	(941) 608-0280	Noah.Fox@greensapphesalth.com	1988-01-31	240
30	9044651	Abdurrah...	P	Zuniga	M	(516) 107-3263	Abdurrahman.Zuniga@greensapphesalth....	1984-03-09	264

Derek Tallent
Drt140030@utd.edu

Shifts Table

	shift_ID	shift_date	shift_num	nurse_ID	Pat_ID1	Pat_ID2	Pat_ID3
1	11976930	2020-01-04	3	2108289	199241	NULL	NULL
2	12285950	2020-01-06	2	2472220	278410	701517	NULL
3	18406844	2020-01-02	2	8095221	919411	451458	NULL
4	19656016	2020-01-10	2	1393118	174563	NULL	NULL
5	21645260	2020-01-10	1	3441257	170210	125268	535697
6	22025676	2020-01-07	1	3523246	490983	653162	NULL
7	22939164	2020-01-02	1	5284044	640994	729881	627535
8	26737667	2020-01-05	3	7791020	738306	467011	199241
9	36324467	2020-01-01	1	2490466	286850	NULL	NULL
10	36604220	2020-01-10	3	4857463	461215	627535	NULL
11	43006703	2020-01-07	2	8017808	884634	NULL	NULL
12	46740174	2020-01-05	2	7306571	701517	243227	NULL
13	49200860	2020-01-01	2	2108289	729881	461215	NULL
14	49230132	2020-01-08	1	7158607	653162	NULL	NULL
15	49498228	2020-01-09	2	7794310	767694	NULL	NULL
16	53499852	2020-01-02	3	5846902	535697	345834	NULL
17	57294399	2020-01-06	1	3441257	868775	738306	NULL
18	60666122	2020-01-03	1	4063164	451458	199241	NULL
19	64327444	2020-01-05	1	7309097	781264	701517	NULL
20	64589474	2020-01-07	3	5996332	627535	NULL	NULL
21	70333715	2020-01-09	1	5284044	460778	293752	461215
22	72323280	2020-01-04	2	1130040	125268	653162	345834
23	73706992	2020-01-09	3	3523246	340002	286850	243227
24	74430252	2020-01-01	3	3490652	334693	NULL	NULL
25	74604831	2020-01-04	1	3349905	293752	NULL	NULL
26	78624123	2020-01-08	2	5284044	467011	738306	NULL
27	79949143	2020-01-08	3	2227289	243227	781264	701517
28	80837547	2020-01-06	3	8821167	962035	NULL	NULL
29	82786616	2020-01-03	2	3867008	345834	125268	NULL
30	99776590	2020-01-03	3	3441257	988793	962035	NULL

Derek Tallent
Drt140030@utd.edu

Room Table

	room_num	Department_ID
1	1	Dept_0001
2	10	Dept_0001
3	100	Dept_0004
4	11	Dept_0001
5	12	Dept_0001
6	13	Dept_0001
7	14	Dept_0001
8	15	Dept_0001
9	16	Dept_0001
10	17	Dept_0001
11	18	Dept_0001
12	19	Dept_0001
13	2	Dept_0001
14	20	Dept_0001
15	21	Dept_0001
16	22	Dept_0001
17	23	Dept_0001
18	24	Dept_0001
19	25	Dept_0001
20	26	Dept_0002
21	27	Dept_0002
22	28	Dept_0002
23	29	Dept_0002
24	3	Dept_0001
25	30	Dept_0002
26	31	Dept_0002
27	32	Dept_0002
28	33	Dept_0002
29	34	Dept_0002
30	35	Dept_0002
31	36	Dept_0002
32	37	Dept_0002

Derek Tallent
Drt140030@utd.edu

Part 2

	room_num	Department_ID
33	38	Dept_0002
34	39	Dept_0002
35	4	Dept_0001
36	40	Dept_0002
37	41	Dept_0002
38	42	Dept_0002
39	43	Dept_0002
40	44	Dept_0002
41	45	Dept_0002
42	46	Dept_0002
43	47	Dept_0002
44	48	Dept_0002
45	49	Dept_0002
46	5	Dept_0001
47	50	Dept_0002
48	51	Dept_0003
49	52	Dept_0003
50	53	Dept_0003
51	54	Dept_0003
52	55	Dept_0003
53	56	Dept_0003
54	57	Dept_0003
55	58	Dept_0003
56	59	Dept_0003
57	6	Dept_0001
58	60	Dept_0003
59	61	Dept_0003
60	62	Dept_0003
61	63	Dept_0003
62	64	Dept_0003
63	65	Dept_0003
64	66	Dept_0003

Derek Tallent
Drt140030@utd.edu

Part 3

	room_num	Department_ID
65	67	Dept_0003
66	68	Dept_0003
67	69	Dept_0003
68	7	Dept_0001
69	70	Dept_0003
70	71	Dept_0003
71	72	Dept_0003
72	73	Dept_0003
73	74	Dept_0003
74	75	Dept_0003
75	76	Dept_0004
76	77	Dept_0004
77	78	Dept_0004
78	79	Dept_0004
79	8	Dept_0001
80	80	Dept_0004
81	81	Dept_0004
82	82	Dept_0004
83	83	Dept_0004
84	84	Dept_0004
85	85	Dept_0004
86	86	Dept_0004
87	87	Dept_0004
88	88	Dept_0004
89	89	Dept_0004
90	9	Dept_0001
91	90	Dept_0004
92	91	Dept_0004
93	92	Dept_0004
94	93	Dept_0004
95	94	Dept_0004
96	95	Dept_0004
96	95	Dept_0004
97	96	Dept_0004
98	97	Dept_0004
99	98	Dept_0004
100	99	Dept_0004

Derek Tallent
Drt140030@utd.edu

Department Table

	Department_ID	Department_Name
1	Dept_0001	Intensive Care
2	Dept_0002	Rehabilitation
3	Dept_0003	Emergency
4	Dept_0004	Maternal

b. *Names of Nurses Working The Week of 01/01/2020: Inner Join nurses and Shifts (those listed more than once working more than 1 shift that week):*

	nur_fname	nur_lname
1	Alysia	Arias
2	Kristen	Calderon
3	Billie	Piper
4	Brianna	Ho
5	Samuel	Zavala
6	Parris	Lott
7	Prince	Edwards
8	Alysia	Arias
9	Ebonii	Diaz
10	Yasmeen	Mackay
11	Marian	Joyner
12	Lewys	Ramos
13	Bartosz	Mcgee
14	Noah	Fox
15	Tyla	Fields

c. Number of Rooms in use in Each Department- Full Join Patient, Room, and Department Tables:

	Department_Name	(No column name)
1	Emergency	6
2	Intensive Care	11
3	Maternal	5
4	Rehabilitation	7

Derek Tallent
Drt140030@utd.edu

d. Patients scheduled for the week of 01/08/2020- Left Join of Shifts and Patient Tables:

	pat_fname	pat_lname	shift_date	shift_num
1	Katie	Firth	2020-01-10	2
2	Maxwell	Fuentes	2020-01-10	1
3	Maison	Gordon	2020-01-10	1
4	Alysia	Lovell	2020-01-10	1
5	Alyssa	Bean	2020-01-10	3
6	Duke	Parsons	2020-01-10	3
7	Aayush	Greaves	2020-01-09	2
8	Tyriq	Craig	2020-01-09	1
9	Arooj	Ross	2020-01-09	1
10	Alyssa	Bean	2020-01-09	1
11	Brent	Davies	2020-01-09	3
12	Zaynah	Maldona...	2020-01-09	3
13	Giorgio	Whyte	2020-01-09	3
14	Zakary	Richard	2020-01-08	2
15	Nisha	Yates	2020-01-08	2
16	Brent	Davies	2020-01-08	3
17	Aislinn	Rennie	2020-01-08	3
18	Kaelan	Armstrong	2020-01-08	3

e. Rooms currently in use in the intensive care unit (Dept_0001)- Right Join of Patient and Room:

Derek Tallent
Drt140030@utd.edu

	Department_ID	room_num
1	Dept_0001	24
2	Dept_0001	8
3	Dept_0001	14
4	Dept_0001	1
5	Dept_0001	11
6	Dept_0001	17
7	Dept_0001	21
8	Dept_0001	20
9	Dept_0001	13
10	Dept_0001	18
11	Dept_0001	9

f. Nurses and Patients with the same first name- Intersect of Patient and Nurse:

	nur_fname
1	Alyssia

g. Nurses And Patients with first names starting with B- Union of Patient and Nurse:

	nur_fname
1	Bartosz
2	Belinda
3	Billie
4	Blake
5	Brent
6	Brianna

Derek Tallent
Drt140030@utd.edu

h. Rooms not currently in use in the Emergency Department (Dept_0003)- Except of Patient and Room:

	room_num
1	52
2	55
3	56
4	57
5	60
6	61
7	62
8	63
9	64
10	65
11	66
12	67
13	68
14	69
15	70
16	71
17	72
18	73
19	74

SQL Code Used

```
Create Database GreenNurseScheduleDB

Use GreenNurseScheduleDB

Create Table Nurse (
Nurse_ID char(7) NOT NULL,
nur_fname varchar(30) NOT NULL,
nur_minit char(1),
nur_lname varchar(30) NOT NULL,
Gender char(1),
phone_num char(30) NOT NULL,
email varchar(50) NOT NULL,
birth_date date NOT NULL,
salary integer NOT NULL
);

Create Table Shifts (
shift_ID char(8) NOT NULL,
shift_date date,
shift_num char(1),
nurse_ID char(7) NOT NULL,
Pat_ID1 char(6) NOT NULL,
Pat_ID2 char(6),
Pat_ID3 char(6),
```

Derek Tallent
Drt140030@utd.edu

```
);

Create Table Patient (
Pat_ID char(6) NOT NULL,
pat_fname varchar(30) NOT NULL,
pat_minit char(1),
pat_lname varchar(30) NOT NULL,
arrival_date date NOT NULL,
pat_birth_date date NOT NULL,
Insur_Company_ID char(12),
room_num char(3) NOT NULL,
gender char(1) NOT NULL
);

Create Table Checks (
Check_ID char(4) NOT NULL,
Amount_Earned Decimal NOT NULL,
nurse_ID char(7) NOT NULL
);

Create Table InsuranceCompany (
Insur_Company_ID char(12) NOT NULL,
Company_Name varchar(30) NOT NULL
);

Create Table Department (
Department_ID char(9) NOT NULL,
Department_Name varchar(30) NOT NULL
);


Create Table Room (
room_num char(3) NOT NULL,
Department_ID char(9) NOT NULL
);

Alter Table Nurse
ADD CONSTRAINT NurseUnique UNIQUE (Nurse_ID)

Alter Table Checks
ADD CONSTRAINT CheckUnique UNIQUE(Check_ID);

Alter Table Department
ADD Constraint DepartmentUnique UNIQUE(Department_ID)

Alter Table Patient
Add Constraint PatientUnique Unique(Pat_ID)

Alter Table InsuranceCompany
Add Constraint InsuranceCompanyUnique Unique(Insur_Company_ID)

Alter Table Room
Add Constraint RoomUnique Unique(room_num)

Alter Table Shifts
Add Constraint ShiftUnique Unique(shift_ID)
```

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Drt140030@utd.edu

```
ALTER TABLE Nurse
ADD Constraint NursePK Primary Key (Nurse_ID)

ALTER TABLE Checks
ADD CONSTRAINT CheckPK Primary Key(Check_ID);

Alter Table Department
ADD Constraint DepartmentPK primary key (Department_ID)

Alter Table Patient
Add Constraint PatientPK Primary Key (Pat_ID)

Alter Table Room
Add Constraint RoomPK Primary Key (room_num)

Alter Table InsuranceCompany
Add Constraint InsurPK Primary Key (Insur_Company_ID)

Alter Table Shifts
Add Constraint ShiftPK Primary Key (Shift_ID)

Alter Table Patient
Add Foreign Key (room_num) References Room(room_num),
       Foreign Key (Insur_Company_ID) References InsuranceCompany(Insur_Company_ID)

Alter Table Shifts
Add Foreign Key (Pat_ID1) References Patient(Pat_ID),
       Foreign Key (Pat_ID2) References Patient(Pat_ID),
       Foreign Key (Pat_ID3) References Patient(Pat_ID),
       Foreign Key (Nurse_ID) References Nurse(Nurse_ID)

Alter Table Room
Add Foreign Key (Department_ID) References Department(Department_ID)

Alter Table Shifts
Add Constraint NurseChecks Check (Nurse_ID<=9999999 AND Nurse_ID>=0000000),
       Constraint PatID1Check Check (Pat_ID1<=99999 AND Pat_ID1>=11111),
       Constraint PatID2Check Check (Pat_ID2<=99999 AND Pat_ID2>=11111),
       Constraint PatID3Check Check (Pat_ID3<=99999 AND Pat_ID3>=11111),
       Constraint ShiftChecks Check (shift_num<=3 AND shift_num>=1)

Alter Table Nurse
Add Constraint NurseTChecks Check (Nurse_ID<=9999999 AND Nurse_ID>=0000000),
       Constraint PhoneChecks Check (phone_num<=999-999-9999 AND phone_num>=000-000-0000),
       Constraint GenderCheck Check (Gender in ('M','F')),
       Constraint SalCheck Check (salary<=100 AND salary>=30)

Alter Table Checks
Add Constraint CidCheck Check (Check_ID>=0000000000 AND Check_ID<=9999999999),
       Constraint NurseCChecks Check (Nurse_ID<=9999999 AND Nurse_ID>=0000000)

Alter Table Department
Add Constraint DepIDCheck Check (Department_ID in ('Dept_0001','Dept_0002','Dept_0003','Dept_0004')),
       Constraint DepNameCheck Check (Department_Name in ('Intensive
Care','Rehabilitation','Emergency','Maternal'))

Alter Table InsuranceCompany
```

Derek Tallent
Drt140030@utd.edu

```
Add Constraint InsurCheck Check (Insur_Company_ID in
('Company_0001','Company_0002','Company_0003','Company_0004','Company_0005','Company_0006')),
       Constraint CompCheck Check (Company_Name in ('Aetna','Humana','Blue Cross Blue
Shield','Cigna','United Healtchare','Wellcare'))

Alter Table Patient
Add Constraint RoomNumCheck Check (Room_num<=100 AND Room_num>=0),
       Constraint PatIDPCheck Check (Pat_ID<=99999 AND Pat_ID>=00000),
       Constraint Insur_Company_IDCheck Check(Insur_Company_ID in
('Company_0001','Company_0002','Company_0003','Company_0004','Company_0005','Company_0006'))

Alter Table Room
Add Constraint RoomNumRCheck Check (Room_num<=100 AND Room_num>=0),
       Constraint DepIDRCheck Check (Department_ID in
('Dept_0001','Dept_0002','Dept_0003','Dept_0004'));

Select * From Checks
Select * From Department
Select * From InsuranceCompany
Select * From Patient
Select * From Room
Select * From Shifts
Select * From Nurse


Alter Table Patient
Add Constraint GenderCheckP Check (Gender in ('M','F'));


Bulk Insert Nurse From 'C:\Users\derek\OneDrive\Documents\Nurse_Table.csv'
With (DataFileType = 'char', FieldTERMINATOR = ',')

Bulk Insert Shifts From 'C:\Users\derek\OneDrive\Documents\Shifts_Table.csv'
With (DataFileType = 'char', FieldTERMINATOR = ',')

Bulk Insert Room From 'C:\Users\derek\OneDrive\Documents\Room_Table.csv'
With (DataFileType = 'char', FieldTERMINATOR = ',')

Bulk Insert Department From 'C:\Users\derek\OneDrive\Documents\Department_Table.csv'
With (DataFileType = 'char', FieldTERMINATOR = ',')

Bulk Insert Patient From 'C:\Users\derek\OneDrive\Documents\Pat_Table.csv'
With (DataFileType = 'char', FieldTERMINATOR = ',')

Bulk Insert Checks From 'C:\Users\derek\OneDrive\Documents\Checks_Table.csv'
With (DataFileType = 'char', FieldTERMINATOR = ',')

Bulk Insert InsuranceCompany From 'C:\Users\derek\OneDrive\Documents\Company_Table.csv'
With (DataFileType = 'char', FieldTERMINATOR = ',')

Select * from Nurse

Select * from Patient

Select * from Shifts
```

Derek Tallent
Drt140030@utd.edu

```
Select * From Department


Select nur_fname, nur_lname
from Shifts
Inner Join Nurse on Shifts.nurse_ID=Nurse.Nurse_ID
Where shift_date < '1/08/2020'

Select Department_Name, Count(Patient.room_num)
From Department
Full Join Room on Department.Department_ID=Room.Department_ID
Full Join Patient on Room.room_num=Patient.room_num
Group By Department_Name

Select pat_fname, pat_lname, shift_date, shift_num
From Patient
Left Join Shifts on Patient.Pat_ID=Shifts.Pat_ID1
                         OR Patient.Pat_ID=Shifts.Pat_ID2
                         OR Patient.Pat_id=Shifts.Pat_ID3
Where Shift_Date > '1/7/2020'

Select Department_ID, Room.room_num
From Room
Right Join Patient on Room.room_num=Patient.room_num
Where Room.Department_ID = 'Dept_0001'

Select nur_fname
From Nurse
Intersect
Select Pat_fname
From Patient

Select nur_fname
From Nurse
Where nur_fname Like 'B%'
Union
Select pat_fname
From Patient
Where pat_fname Like 'B%'

Select Room.room_num
From Room
Where Department_ID='Dept_0003'
Except
Select Patient.room_num
From Patient
```