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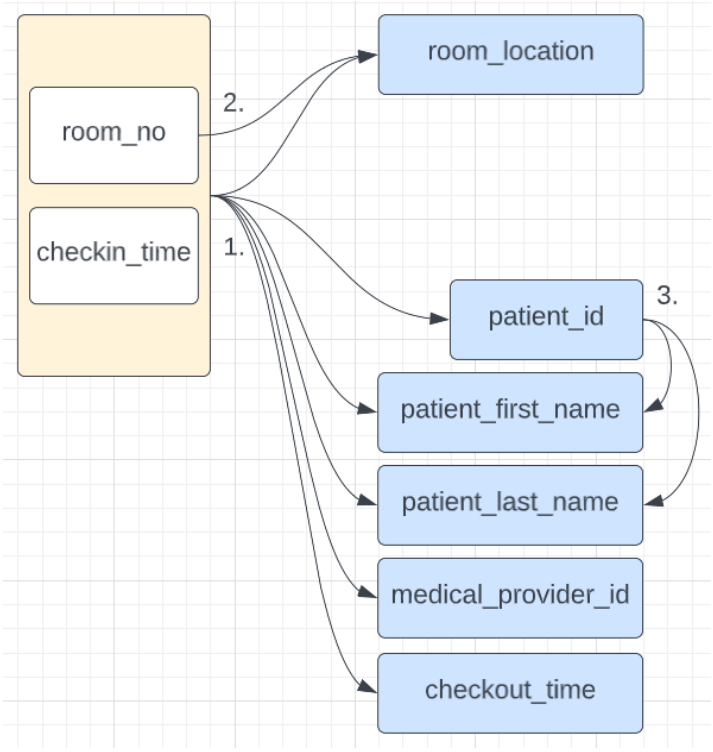
A7 - Normalization / 3NF:

Compound PK w/ Partial Dependency:

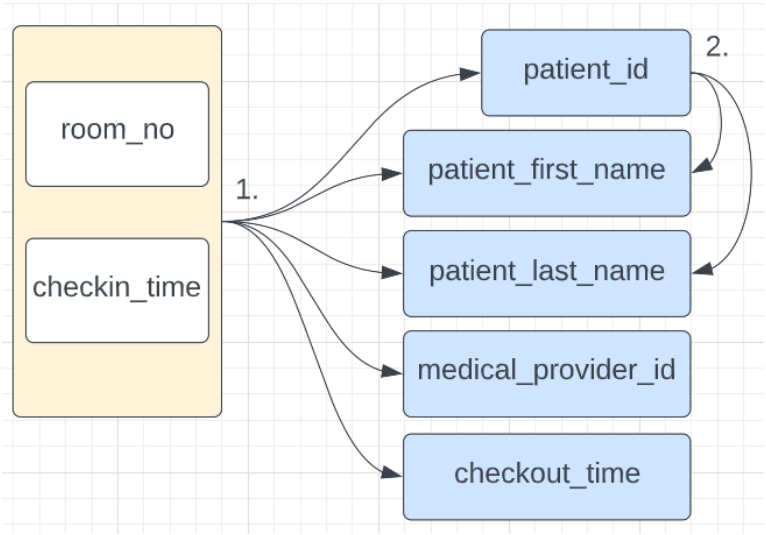
R1: **PATIENT_CHECK_IN** (<u>room_no</u>, <u>checkin_time</u>, patient_id, patient_first_name, patient_last_name, medical_provider_id, checkout_time, room_location)



FD: 1. room_no, checkin_time → patient_id, patient_first_name, patient_last_name, medical_provider_id, checkout_time, room_location
2. room_no → room_location
3. patient_id → patient_first_name, patient_last_name

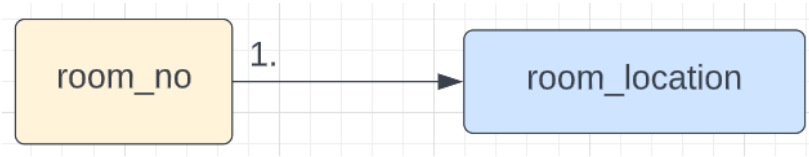
Compound PK w/ Partial Dependency to 2NF + Transitive FD:

R1.1: (<u>room_no</u>, <u>checkin_time</u>, patient_id, patient_first_name, patient_last_name, medical_provider_id, checkout_time)



FD: 1. room_no, checkin_time → patient_id, patient_first_name, patient_last_name, medical_provider_id, checkout_time
2. patient_id → patient_first_name, patient_last_name

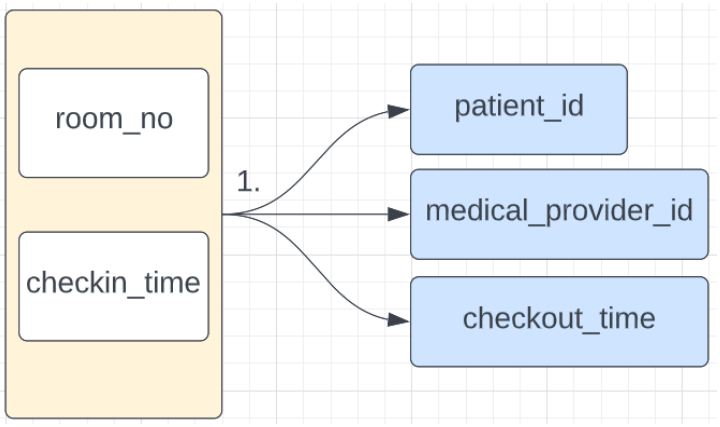
R1.2: (<u>room_no</u>, room_location)



FD: 1. room_no → room_location

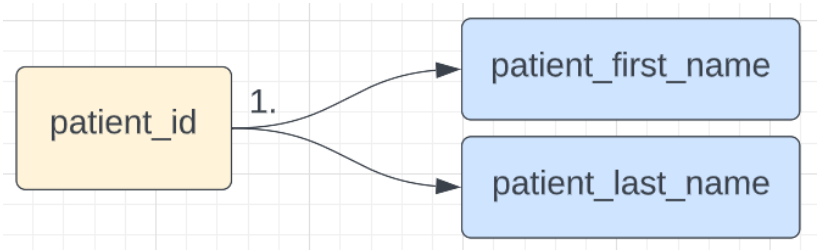
Transitive FD to 3NF:

R1.1.1: (<u>room_no</u>, <u>checkin_time</u>, patient_id, medical_provider_id, checkout_time)



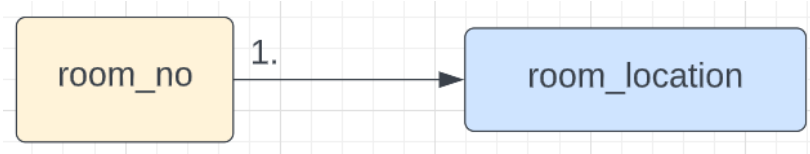
FD: 1. room_no, checkin_time → patient_id, medical_provider_id, checkout_time

R1.1.2: (<u>patient_id</u>, patient_first_name, patient_last_name, medical_provider_id, checkout_time)



FD: 1. patient_id → patient_first_name, patient_last_name

R1.2: (<u>room_no</u>, room_location)



FD: 1. room_no → room_location

All Tables (in 3NF):

Table: **APPOINTMENT**
Functional Dependencies:
appt_id → patient_id, medical_provider_id, appt_creation_date, appt_date, appt_time, appt_reason

- This table is in 1NF because all values are atomic
- This table is in 2NF because all non-key attributes are fully functionally dependant on the primary key, appt_id
- This table is in 3NF because all non-key attributes are non-transitively dependant on the primary key, appt_id
- This table is in BCNF because all attributes are dependant on the primary (candidate) key, appt_id

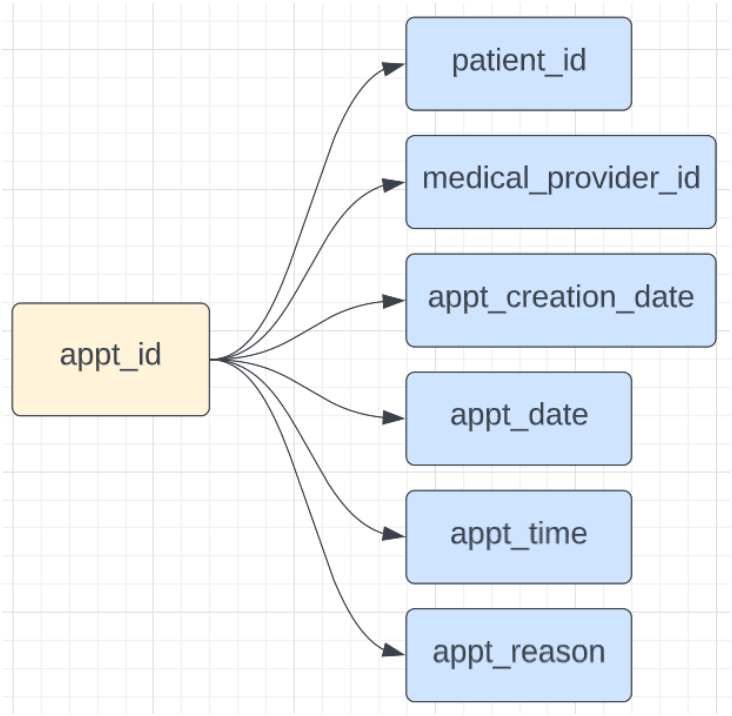


Table: **EMPLOYEE_AVAILABILITY**
Functional Dependencies:
employee_number → available_sick_days, available_pto_days, specified_days_off, weekly_available_days, notes

- This table is in 1NF because all values are atomic
- This table is in 2NF because all non-key attributes are fully functionally dependant on the primary key (also a foreign key (1-to-1 relation)), employee_number
- This table is in 3NF because all non-key attributes are non-transitively dependant on the primary key (also a foreign key (1-to-1 relation)), employee_number
- This table is in BCNF because all attributes are dependant on the primary (candidate) key (also a foreign key (1-to-1 relation)), employee_number

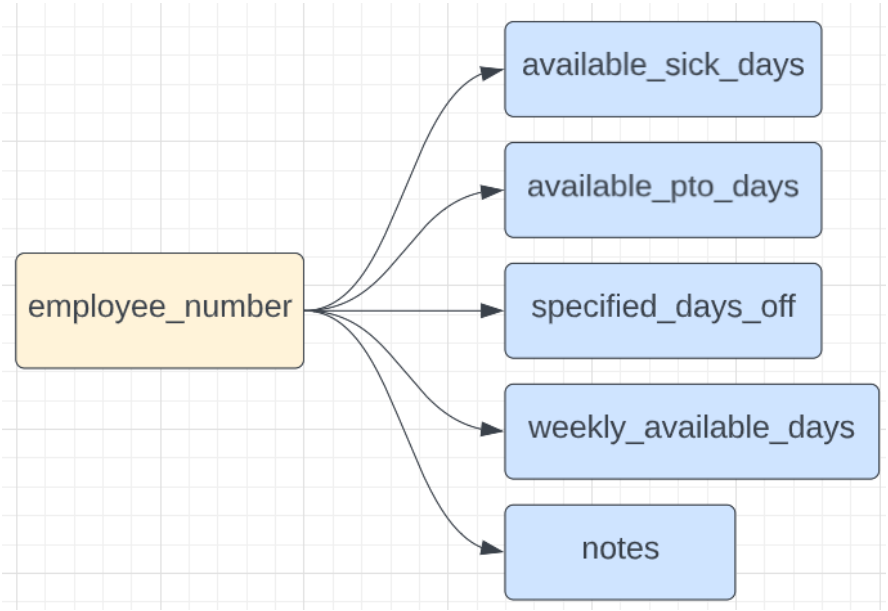


Table: **ITEM_SUPPLY_INFO**
Functional Dependencies:
{Item_id, supplier} → num_recieved, date_recieved, expiry_date

- This table is in 1NF because all values are atomic
- This table is in 2NF because all non-key attributes are fully functionally dependant on the primary keys (also a foreign key), item_id & supplier
- This table is in 3NF because all non-key attributes are non-transitively dependant on the primary keys, item_id & supplier
- This table is in BCNF because all attributes are dependant on the primary key item_id & supplier

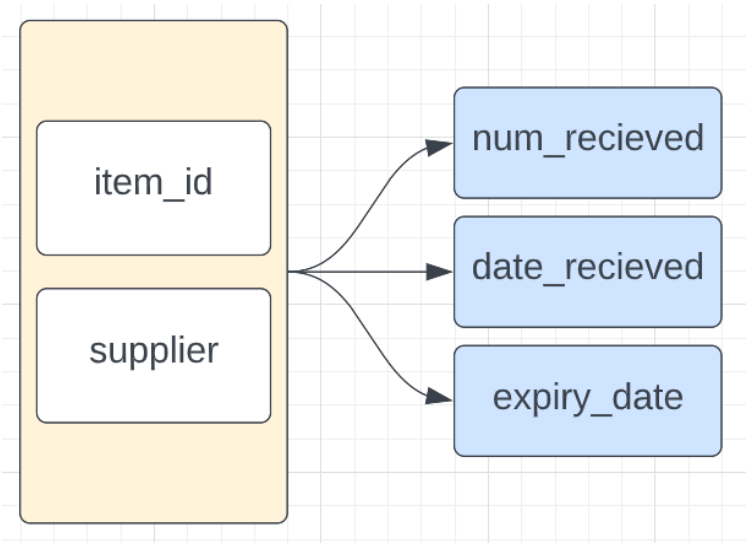


Table: **MEDICAL_STAFF**
Functional Dependencies:
employee_number → medical_provider_id

- This table is in 1NF because all values are atomic
- This table is in 2NF because all non-key attributes are fully functionally dependant on the primary key (also a foreign key (1-to-0…1 relation)), employee_number
- This table is in 3NF because all non-key attributes are non-transitively dependant on the primary key (also a foreign key (1-to-0…1 relation)), employee_number
- This table is in BCNF because all attributes are dependant on the primary (candidate) key, employee_number

Table: **PATIENT_MEDICAL_HEALTH_INFO**
Functional Dependencies:
patient_id → ohip_number, current_meds, notes

- This table is in 1NF because all values are atomic
- This table is in 2NF because all non-key attributes are fully functionally dependant on the primary key (also a foreign key (1-to-1 relation)), patient_id
- This table is in 3NF because all non-key attributes are non-transitively dependant on the primary key (also a foreign key (1-to-1 relation)), patient_id
- This table is in BCNF because all attributes are dependant on the primary (candidate) key, patient_id

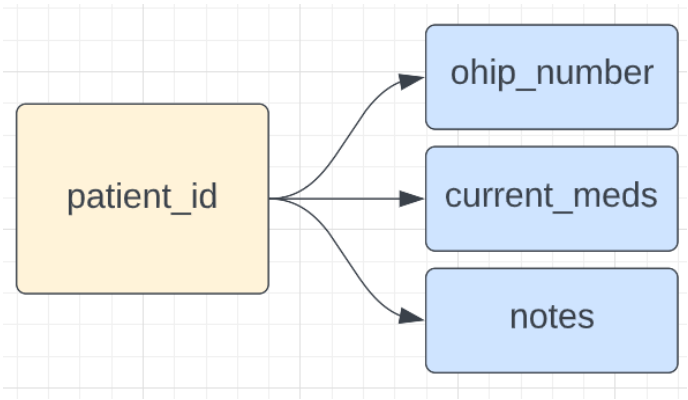


Table: **PATIENTS**
Functional Dependencies:
patient_id → first_name, last_name, gender, DOB, phone_no, email, address

- This table is in 1NF because all values are atomic
- This table is in 2NF because all non-key attributes are fully functionally dependant on the primary key, patient_id
- This table is in 3NF because all non-key attributes are non-transitively dependant on the primary key, patient_id
- This table is in BCNF because all attributes are dependant on the primary (candidate) key, patient_id

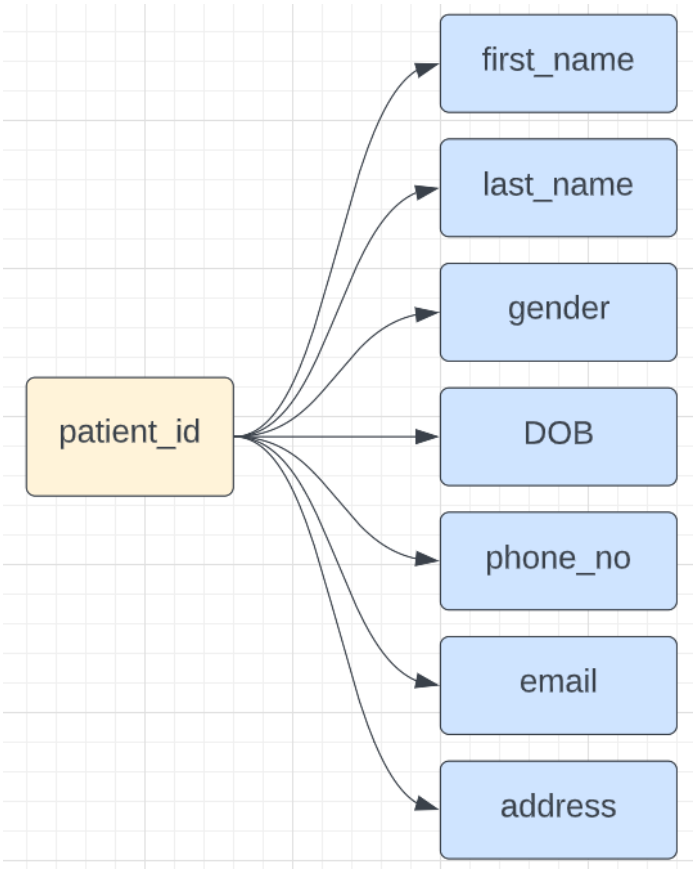


Table: **STAFF**
Functional Dependencies:
employee_number → SIN, first_name, last_name, department, DOB, phone_no, email, address

- This table is in 1NF because all values are atomic
- This table is in 2NF because all non-key attributes are fully functionally dependant on the primary key, employee_number
- This table is in 3NF because all non-key attributes are non-transitively dependant on the primary key, employee_number
- This table is in BCNF because all attributes are dependant on the primary (candidate) key, employee_number

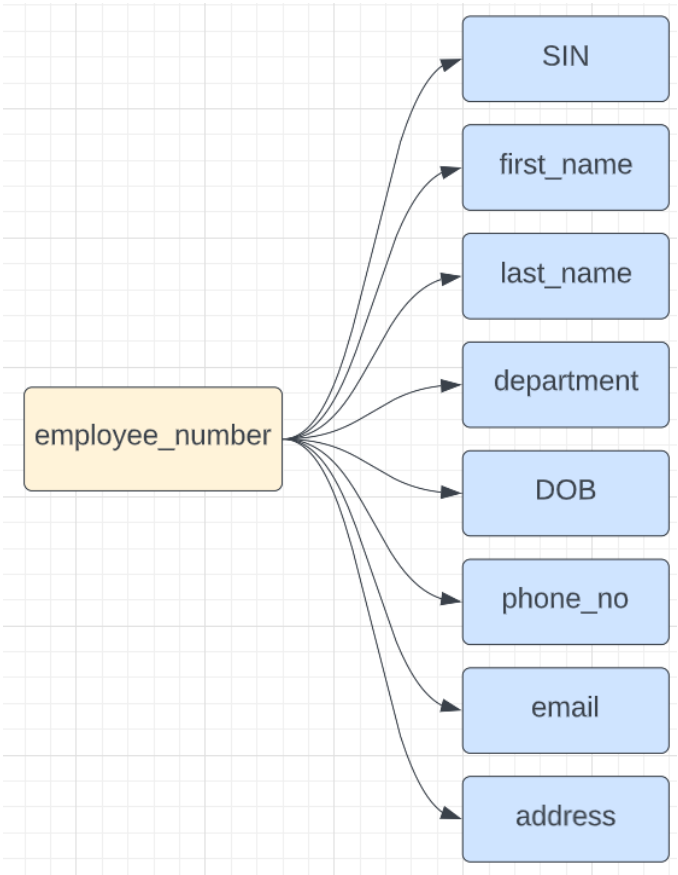


Table: **SUPPLIES**
Functional Dependencies:
item_id → item, quantity, storage_location
item → item_id

- This table is in 1NF because all values are atomic
- This table is in 2NF because all non-key attributes are fully functionally dependant on the primary key, item_id
- This table is in 3NF because all non-key attributes are non-transitively dependant on the primary key, item_id
- Item_id is dependent on item, but since item_id is not a non-candidate key attribute, 3NF still holds
- This table is in BCNF because all attributes are dependent on the primary key item_id. Also item is a candidate key so BCNF still holds