Northeastern University

Week 2 Assignment

Hospital-Nursing-Intervention-Pilot-Program-SQL

Course: ALY 6030 Data Warehousing and SQL
Academic Year: Winter 2023

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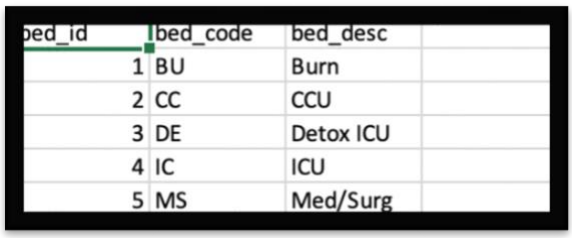
1. IDENTIFY THE DIMENSIONS FROM EACH DIMENSION TABLE

Table: Bed_type



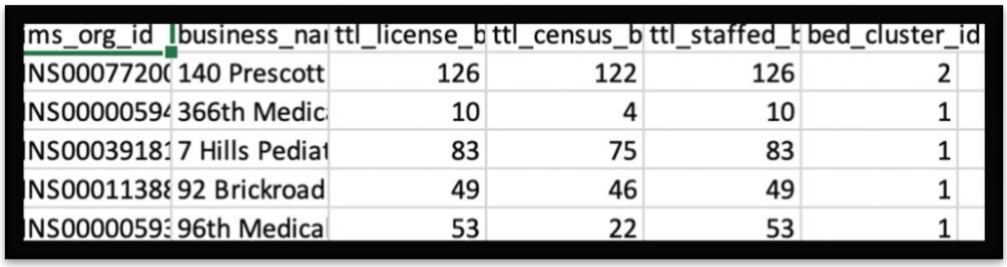
bed_id	bed_code	bed_desc
1	BU	Burn
2	CC	CCU
3	DE	Detox ICU
4	IC	ICU
5	MS	Med/Surg

The above Table Bed type has 3 attributes in total that are:-

1. Bed-id: It is the unique id that is given to every bed that is in the Hospital. As it is a primary key this qualifies as a **dimension**.
2. bed_code: This attribute refers to the kind of bed that it is. Being just a code of representation this column also comes under **dimension**.
3. Bed_desc: This column tells a short description of the bed like what purpose it's used for thus not being a fact and can be changed, thus this is also a **dimension.**

So in the table Bed_type all three columns are dimensions and have no fact in them.

Table: Business



ims_org_id	business_nar	ttl_license_b	ttl_census_b	ttl_staffed_b	bed_cluster_id
NS00077200	140 Prescott	126	122	126	2
NS0000059⁴	366th Medic	10	4	10	1
NS00039181	7 Hills Pediat	83	75	83	1
NS00011388	92 Brickroad	49	46	49	1
NS0000059³	96th Medica	53	22	53	1

The above Table Business has 6 attributes in total that are:-

1. ims_org_id: It is a unique id that is there to categorise the fact so this will be counted as a **dimension** attribute.
2. Business_name: This tells you about the name of the business that the organisation is using again this is more of a **dimension** rather than a fact
3. license_beds: This is a count of license Beds that the organisation have which makes it a measure and also happens to be a numerical value thus this is a **Fact**.
4. census_beds: This is a count of Census Beds that the organisation have which makes it a measure and also happens to have a numerical value thus this is a **Fact**.
5. ttl_staffed_beds: Again This is a count of Beds that are staffed right now that the organisation have which makes it a measure and also happens to have a numerical value thus this is a **Fact**.
6. bed_cluster_id: This is a unique id that is used to cluster the fact, thus being used for categorising the bed rather than giving the fact information which makes it **dimension**.

There are Total 3 Facts and 3 Dimensions in above table.

2. IDENTIFY THE FACTS VARIABLES FROM THE SINGLE FACT TABLE

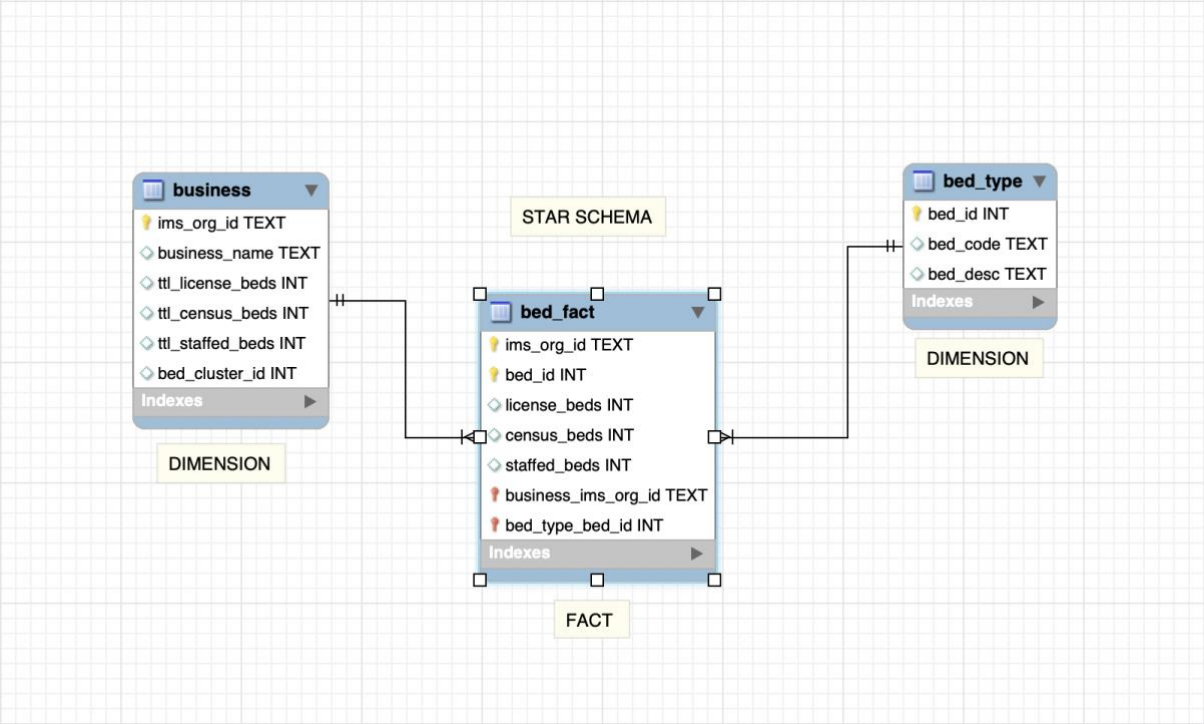
ims_org_id	bed_id	license_beds	census_beds	staffed_beds
INS00000519	2	10	7	10
INS00000519	5	566	394	566
INS00000519	15	25	17	25
INS00000519	4	38	26	38
INS00000519	6	32	22	32
INS00000519	18	671	466	671
INS00000520	18	25	14	25
INS00000520	5	25	14	25
INS00000521	5	25	16	25

The above Table Bed_fact has 5 attributes in total that are:-

1. ims_org_id: It is a unique id that is there to categorise the fact so this will be counted as a **dimension** attribute.
2. Bed-id: It is the unique id that is given to every bed that is in the Hospital. As it is a primary key this qualifies as a **dimension**.
3. license_beds: This is a count of license Beds that the organisation have which makes it a measure and also happens to be a numerical value thus this is a **Fact**.
4. census_beds: This is a count of Census Beds that the organisation have which makes it a measure and also happens to have a numerical value thus this is a **Fact**.
5. ttl_staffed_beds: Again This is a count of Beds that are staffed right now that the organisation have which makes it a measure and also happens to have a numerical value thus this is a **Fact**.

Thus this table has **3 Facts** that are **licens_beds, census_beds, ttl_stafed_beds**.

3. SKETCH OUT A STAR SCHEMA USING MYSQL WORKBENCH



The above table is a correct representation of the star schema. Where the fact table always comes in the centre and the dimension table on the edges because of which the table bed_fact is in the centre also being the fact table in our schema. Business and Bed_type on the edges as they are the dimension table consisting more of dimensional attributes in them

The relationship is based on the facts that :

1. Weak (Non-Identifying) Relationship
    - Entity is existence-independent of other entries
    - PK of Child doesn't contain PK component of Parent Entity

2. Strong (Identifying) Relationship
    - Child entity is existence-dependent on parent
    - PK of Child Entity contains PK component of Parent Entity –right which is what we see here
    - Usually occurs utilizing a composite key for primary key

4A. ANALYSIS FOR LEADERSHIP

LICENSE BEDS:

```
1  Select business_name ,  sum(license_beds) from bed_fact as b inner join
2  business as s on b.ims_org_id = s.ims_org_id
3  where bed_id= 4 or bed_id = 15
4  group by b.ims_org_id
5  order by 2 desc limit 10;
6
7
```

100% 1:7

Result Grid | Filter Rows: Search | Export: | Fetch rows:

business_name	sum(license_beds)
Phoenix Childrens Hospital	247
University of Maryland Medical Center	220
UC Health University Hospital	218
Wesley Medical Center, LLC	214
Vidant Medical Center	204
Rady Childrens Hospital and Health Center	200
Dallas County Hospital Association	195
Saint Lukes Episcopal Hospital Texas Medical C...	178
The Methodist Hospital	170
Emory University Hospital	169

CENSUS BEDS:

```
1  Select business_name as Hospital_name, sum(census_beds) as Total_beds from bed_fact as b inner join
2  business as s on b.ims_org_id = s.ims_org_id
3  where bed_id= 4 or bed_id = 15
4  group by b.ims_org_id
5  order by 2 desc limit 10;
```

100% 26:5

Result Grid | Filter Rows: Search | Export: | Fetch rows:

Hospital_name	Total_beds
Shands Hospital at the University of Florida	167
Dallas County Hospital Association	145
Mercy Medical Center Saint Louis	142
Los Angeles County University of Southern Calif...	139
The Methodist Hospital	138
University of Minnesota Medical Center Fairview	129
University of Maryland Medical Center	127
Brigham and Womens Hospital	124
Vidant Medical Center	123
Ronald Reagan University of California Los Ang...	122

STAFFED BEDS:

```
1  Select business_name as Hospital_name,  sum(staffed_beds) as Total_beds from bed_fact as b inner join
2  business as s on b.ims_org_id = s.ims_org_id
3  where bed_id= 4 or bed_id = 15
4  group by b.ims_org_id
5  order by 2 desc limit 10;
```

100% 26:5

Result Grid Filter Rows: Search Export: Fetch rows:

Hospital_name	Total_beds
Vidant Medical Center	203
Rady Childrens Hospital and Health Center	200
University of Maryland Medical Center	171
Emory University Hospital	169
Shands Hospital at the University of Florida	167
Mercy Medical Center Saint Louis	163
Wesley Medical Center, LLC	162
Phoenix Childrens Hospital	159
Grady Memorial Hospital	154
Los Angeles County University of Southern Calif...	151

4B. INTERPRETATION OF FINDINGS

- Top 3 hospitals with the sum of licenced ICU and SICU beds are Phoenix Childrens Hospital, University of Maryland Medical Centre, UC Health University hospital.
- Top 3 hospitals with the sum of Censused ICU and SICU beds are Shands Hospital University of Florida, Dallas County Hospital Association, Mercy Medical Centre Saint Louis.
- Top 3 hospitals with the sum of Staffed Bed ICU and SICU beds are Vidant Medical Centre, Rady Children Hospital and Health Care, , University of Maryland Medical Centre.
- Shands Hospital at the University of florida, University of Mary land Medical centre Appearing in more than two lists which make them good candidates for the intervention pilot program.

5A. DRILL DOWN INVESTIGATION

LICENSE BEDS:

```
1  Select business_name ,  sum(license_beds) from bed_fact as b inner join
2  business as s on b.ims_org_id = s.ims_org_id
3  where bed_id= 4 or bed_id = 15
4  group by b.ims_org_id
5  having COUNT(b.bed_id) > 1
6  order by 2 desc limit 10;
7
```

100% 26:6

Result Grid | Filter Rows: Search | Export: | Fetch rows:

business_name	sum(license_beds)
University of Maryland Medical Center	220
UC Health University Hospital	218
Shands Hospital at the University of Florida	167
MCGHealth, Inc	155
Grady Memorial Hospital	154
Jackson Memorial Hospital	151
University Hospital in Bexar County	144
University of Minnesota Medical Center Fairview	144
Carolinas Medical Center	137
Yale New Haven Hospital	136

CENSUS BEDS:

```
1  Select business_name as Hospital_name, sum(census_beds) as Total_beds from bed_fact as b inner join
2  business as s on b.ims_org_id = s.ims_org_id
3  where bed_id= 4 or bed_id = 15
4  group by b.ims_org_id
5  having COUNT(b.bed_id) > 1
6  order by 2 desc limit 10;
```

100% 26:6

Result Grid | Filter Rows: Search | Export: | Fetch rows:

Hospital_name	Total_beds
Shands Hospital at the University of Florida	167
University of Minnesota Medical Center Fairview	129
University of Maryland Medical Center	127
Jackson Memorial Hospital	117
UC Health University Hospital	110
Carolinas Medical Center	106
Cedars Sinai Health System	92
Duke University Health System	91
University Hospital in Bexar County	91
Grady Memorial Hospital	88

STAFFED BEDS :

```
1  Select business_name as Hospital_name,  sum(staffed_beds) as Total_beds from bed_fact as b inner join
2  business as s on b.ims_org_id = s.ims_org_id
3  where bed_id= 4 or bed_id = 15
4  group by b.ims_org_id
5  having COUNT(b.bed_id) > 1
6  order by 2 desc limit 10;
```

100% 26:6

Result Grid | Filter Rows: Search | Export: | Fetch rows:

Hospital_name	Total_beds
University of Maryland Medical Center	171
Shands Hospital at the University of Florida	167
Grady Memorial Hospital	154
UC Health University Hospital	151
University of Minnesota Medical Center Fairview	144
Carolinas Medical Center	137
Chattanooga Hamilton County Hospital Authority	134
Saint Josephs Hospital and Medical Center	134
Jackson Memorial Hospital	128
Sunrise Hospital and Medical Center, LLC	125

5B. FINAL RECOMMENDATION

- It is really amazing to know from the analysis that **University of Maryland Medical Center** has most number of sum of ICU and SICU license and staffed beds. Although it ranks third for the census beds, this hospital would be the perfect location for implementing new strategies and getting the data approximation with less error and more precision.
- **Shands Hospital at University of Florida** has most number of sum of ICU and SICU census beds. Also, Shands Hospital at University of Florida is in the top 3 list of license and staffed beds.
- There are 9 hospitals that were listed in more than one top 10 lists which are as followed:
    1. University of Maryland Medical Center
    2. UC Health University Hospital
    3. Shands Hospital at University of Florida
    4. Jackson Memorial Hospital
    5. University of Minnesota Medical Center Fairview
    6. Carolina Medical Center
    7. Grady Memorial Hospital
    8. MCGhealth, Inc
    9. University Hospital in Bexar County

- The above 9 mentioned hospitals were in more than one top 10 list for ICU + SICU beds.
- There are 6 hospitals that were listed in all three top 10 lists which are as followed:
    1. University of Maryland Medical Center
    2. UC Health University Hospital
    3. Shands Hospital at University of Florida
    4. Jackson Memorial Hospital
    5. University of Minnesota Medical Center Fairview
    6. Carolina medical center
- The above 6 mentioned hospitals were in the top 10 list for license beds, census beds and staffed feds for ICU + SICU beds.
- They are similarly great locations for testing new strategy implementations but their results would not be as high as University of Maryland Medical Center

REFRENCES:

Myrianthous, G. (2022, April 2). Fact vs Dimension Tables in Star Schema | Towards Data Science. Medium. https://towardsdatascience.com/star-schema-924b995a9bdf

TutorialsPoint. (2022, August 22). Difference Between Fact Table and Dimension Table. https://www.tutorialspoint.com/difference-between-fact-table-and-dimension-table

Naveen,N.SQL (2021,Jan23).SQL Commands Cheat Sheet https://intellipaat.com/blog/tutorial/sql-tutorial/sql-commands-cheat-sheet/