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**ALY 6030: Data Warehouse and SQL**

**Hospital Nursing Intervention Pilot Program**

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**Introduction**

In order to provide better care for critically ill patients who are admitted to ACME's hospital network's Intensive Care Units (ICU) and Surgical Intensive Care Units (SICU), leadership intends to start an intervention to employ additional nurses. Higher nurse-to-patient ratios have been shown in the medical literature to improve outcomes in these intensive care settings.

But only hospital facilities with enough ICU and SICU beds—as measured by the three different categories of beds: license beds, census beds, and staffed beds—will be able to afford this intervention.

The management is interested in picking one or two hospitals to serve as the pilot locations for their intervention, which will begin in the upcoming quarter. You must first create a list of the Top 10 Hospitals based on the amount of ICU/SICU beds in order for them to select these pilot sites.

* Licensed beds (Total beds allowed by state license)
* Census beds 9 total beds at the hospital)
* Staffed beds (total beds for which staffing, e.g, physicians, and nurses, exists)

  To analyze and categorize these fields as facts versus dimensions, companies require our help so they can better comprehend the structure of their data. Because dimensional modeling and data warehousing are completely unfamiliar.

**Step 1: Identify the dimensions from each dimension table**

You'll notice in bed\_type there are only three variables, bed\_id, bed\_code, and bed\_desc. Consider which of these is a fact if any and which is a dimension. Note that the PK qualifies as a dimension.

For the business table, pay attention to the differences between a fact and a dimension variable as we discussed in class. In this table there are only three dimensions to select. See if you can correctly identify which ones they are (again the PK can be counted as one dimension).

**Answer Part 1:** As we can see, the definition of a fact is that a column in the bed-type table must include an aggregated value. According to my evaluation, all three columns in this table—bed\_id, bed\_code, and bed\_desc—are dimensions rather than facts.

**Part 2:** We can see that the business table has 6 columns, 3 of which—ims\_org\_id, business\_name, and bed\_cluster\_id—are the table's dimensions.

**Step 2: Identify the Facts variables from the single Fact Table**

Consider what type of variable would be a fact vs. a dimension and select three of those from the bed\_fact table. Be aware, it is likely that some variables in a fact table are dimensions, for example a foreign key or anything of that sort is a dimension even if it's listed in the fact table.

**Answer 2:** It says that the facts columns in the bed\_fact table are staffed beds, census beds, and license beds whereas ims\_org\_id and bed\_id are dimensions.

**Step 3: Sketch out a Star Schema using MySQL Workbench**

Include both the data tables of interest and the appropriate joins between the tables that can be used to answer the questions.

Use MySQL to draw the star schema. Be sure to label the fact table and dimension tables accordingly (you can always add a text box above the tables in MySQL Workbench if you need to)

Paste a screenshot of your Star Schema below:

Diagram

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Fact Table

Dimension Table

Dimension Table

**Step 4a: Analysis for Leadership**

Identify which hospitals have an Intensive Care Unit (ICU bed\_id = 4) bed **or** a Surgical Intensive Care Unit (SICU bed\_id = 15) bed **or both**.

Create three summary reports that show the following:

1) License beds: List of Top 10 Hospitals ordered descending by the total ICU or SICU license beds.

Include just two variables, hospital\_name (business\_name) and the total license beds from above as one summary fact. But include only 10 rows in your output table.

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2) Do the same thing for Census beds. List of Top 10 Hospitals ordered by total icu or sicu census beds. Include just two variables, hospital\_name (business\_name) and the total census beds from above as one summary fact. Include only 10 rows again.

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3) Do the same thing for Staffed beds. List of Top 10 Hospitals ordered by the total icu or sicu staffed beds. Include just two variables, hospital\_name (business\_name) and the sum of staffed beds from above as one summary fact. Include only 10 rows again.

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**Step 4b: Interpretation of findings**

Based on your results from step 4a, discuss your insights from the data summary that you want to bring to the attention of Leadership.

For example, what are the top one or two hospitals per list based on bed volume? Are there any hospitals that appear on multiple lists? They might make good candidates for the intervention pilot program.

**Answer:** Phoenix Children's Clinic and College of Maryland Medical Center are the top two in the license beds category, with volumes 247 and 220, respectively. The two top hospitals in the staffed bed category are Vidant Medical Center and Rady Children Healing Center & Wellness Center. With 167 and 145 census beds respectively, Shand's Healing center at the College of Florida and Dallas County Clinic Affiliation are the top two.

**Step 5a: Drill down the investigation**

Leadership is also interested in hospitals that have a sufficient volume of **both** ICU **and** SICU beds, as opposed to either type of bed that you developed in step 4a.

Conduct the same investigation as you did for 4a and list the same output of the top 10 hospitals by descending bed volume, only this time select only those top 10 hospitals that have both kinds of ICU and SICU beds, i.e. only hospitals that have at least 1 ICU bed and at least 1 SICU bed can be included in this part of the analysis.

Conduct separate data investigations for Census beds, License beds, and staffed beds, like step 4a.

Answer: Here are the separate data investigation for

Table

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1. Total Census Beds

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2, Total License\_beds

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3. Total Staffed beds

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**Step 5b: Final recommendation**

Based on your analyses in steps 4a and 5a, state your final recommendation here for Leadership as to **which hospitals are the best candidates for their pilot intervention program**. Remember, Leadership stated they are only interested in **one or two** hospitals for their pilot sites so it’s best to tailor your recommendation to their business need and avoid unnecessary details that might confuse them. Identify your hospitals and briefly explain why you chose them.

**Answer:** In the above research findings in SQL in this pilot intervention program **“Shands Hospital at the University of Florida”** recommending as the best candidate for leadership. In total **Shands Hospital at the University of Florida 501 beds**.