LeanTaaS Take Home Assignment
Data Analyst – iQueue for Operating Rooms

Intro

At LeanTaaS, we pride ourselves on considering bright, driven candidates from a wide variety of backgrounds. To make sure that you can showcase your full range, we'd like you to complete this take home exercise. We know your time is valuable, but we've given you this exercise for the following reasons:

It gives you the opportunity to learn about us. Does our product interest you? Do you enjoy this type of analytics? Did we choose a thoughtful and challenging exercise?

It gives us the opportunity to learn about you. Were you able to clearly communicate your assumptions and results? Are you able to translate raw data into a meaningful narrative through data preparation, data visualization and supporting written communication?

Our expectations: Although we want to see your best work we don't expect you to spend an exorbitant amount of time on this – no more than a couple hours. The assignment contains limited information about the problem so feel free to make your best assumptions and base your work off them. We look forward to getting a glimpse into your thinking process and if you have questions, don't hesitate to ask!

Assignment Details

Guiding Questions

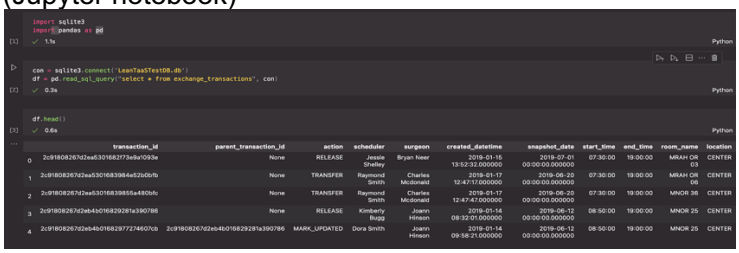
- A customer is looking to showcase their recent go-live with iQueue (description of the iQueue for Operating Rooms product is at the bottom of the document) to their executive sponsors and have asked us to produce a 1 pager highlighting the value they've seen with Exchange so far and any opportunities they might have to increase adoption across their locations.
    - Adoption of iQueue can potentially be measured by number of approved requests, releases and transfers. Opportunities for improvement within iQueue can potentially be measured by locations that might be further behind in adoption or having higher denial rates. These are just potential areas to start, but feel free to come up with other creative metrics/insights!

Deliverables

- 1 page PDF document that contains visuals (graphs) and explanations of the visuals and how it relates it to the overall narrative you're looking to tell
    - With this limited amount of space, think through what you'd want the customer to be able to quickly gather from the document
- Document outlining the process and code for coming up with the insights
    - Feel free to use any technique and tool that you'd like that can include but not limited to: Python, SQL, Tableau, Excel, or R
        - Will need to share the code/process for the approach you chose

Raw Data

- Attached you will find a .db file that contains the raw data that can be used for this analysis. Below are common ways in which you might access this data. Further below is a data dictionary for this dataset so you can be more familiar on how to interact with the data

- DBeaver (SQL database editor)
  - Download DBeaver Community Edition
  - Select Database → New Database Connection → SQLite
  - Navigate to the .db file location
  - Can write SQL queries against the dataset and export as needed
- Python (Jupyter notebook)
  - 
- Data Dictionary

Field Name	Description
transaction_id	A uniquely generated serial number for each individual transaction on the Exchange platform.
parent_transaction_id	The transaction id of the parent transaction or responses (approve, deny, mark updated).
action	The type of transaction: 1. RELEASE - A release of existing block time 2. MARK_UPDATED - The parent transaction has been successfully updated in the hospital's EHR 3. REQUEST - A request for open time 4. APPROVE_REQUEST - The parent request has been approved 5. DENY_REQUEST - The parent request has been denied 6. TRANSFER - A transfer of time from one person to another 7. APPROVE_TRANSFER - The parent transfer has been approved 8. DENY_TRANSFER - The parent transfer has been denied
scheduler	The person creating the transaction.
surgeon	The surgeon for whom the transaction is made.
created_datetime	Date and time when the transaction was created.
snapshot_date	The date of the block associated with the transaction.
start_time	The start time of the block associated with the transaction.
end_time	The end time of the block associated with the transaction.
room_name	The hospital room of the transaction.
location	The hospital location of the transaction.

iQueue Background

iQueue for Operating Rooms (OR) is a software product which helps free up capacity in operating rooms and create a more transparent and surgeon-centric process for measuring Operating Room utilization.

A typical hospital will have multiple ORs, e.g. 10 rooms staffed to carry out surgical procedures Monday to Friday. OR management has utilized a system called Block Scheduling to arrange and coordinate their surgeons to schedule their surgeries smoothly. The idea is that a room is typically reserved for a certain surgeon, or a group of them on a certain day-of-week e.g. Dr. Johnson gets Room 1 every Monday, the Thoracic group gets Room 2 every Wednesday etc. It sometimes can be a bit more nuanced, e.g. the frequency could be bi-weekly or others, and sometimes people may give half day blocks instead of full day blocks depending on the typical case length and volume. Also, many hospitals may assign some open time in some rooms on some days, e.g. every Monday and Wednesday Room 5 is open and it follows FCFS. The benefit of the Block Scheduling system is that it provides some certainty for surgeons and other people involved to carry out a surgical case successfully. The problem with it is that sometimes surgeons cannot fill their blocks well with the cases, e.g. they go on vacations or attend conferences or simply have a slower season etc.

One of the modules within iQueue for OR is called Exchange, a marketplace built on top of a customer's Electronic Health Record system for releasing, requesting and transferring OR time. Basically, if Dr. Johnson is going to a conference in 5 weeks and knows that he will not need to utilize that Monday block then he can release the time and other people can have the visibility of that released time and may request it in order to utilize the OR resource. In the hospital setting, surgeons, or their schedulers, will [1] create a release, request or transfer action, the OR schedulers will [2] review these actions and respond with an approval / denial, and finally the OR schedulers will [3] identify that they've marked and updated their internal Electronic Health Record system accordingly.