Task:

1) **(SQL/PostgreSQL):** For each day and market in September 2020: How many appointments were completed? How many hours were spent onsite? How many routes were used to complete those appointments?
2) **(Excel/Tableau):** Which markets over/(under) performed relative to the daily network average of completed appointments?Which markets were most/(least) efficiently utilized routes in terms of onsite duration?Which markets should stakeholders focus on improving? Which market should these improvements be modeled after? Why? What's your initial hypothesis for why one market may outperform another? If you had access to more operations data, how would you test your hypothesis?

Deliverables:

A. BDb.fiddle Link: https://www.db-fiddle.com/f/mZ1erFAtiif9xukUxTsEEk/69

Query SQL

```sql
SELECT

SUM (count_appointments) AS Appts_Complete,
total_onsite_hours,market, date

FROM appointments
    WHERE date>='2020-09-01'
    AND date <='2020-09-30'

GROUP BY total_onsite_hours,date, market

ORDER BY date,market DESC;

Select appointments.id
From appointments
    FULL OUTER JOIN routes
        ON routes.appointment_id=appointments.id
```

B. Communication**:**

After conducting thorough data normalization, multi-aggregate SQL query, and data visualization in Excel, it is evident that MakeSpace's four main markets are performing to various extents of the market-average.

Notably, given sample data from the month of September 2020, the Chicago market's volume **(9.06 appointments/day)** is considerably lower than the market-average of **27.4 appointments**. In similar regard, the Chicago market used **401 on-site hours (a 44.66% utilization rate)** to fulfill it's appointment demand, a number that is in the middle of the pack but does not reflect nearly as much volume as New York (**68.3 appointments/day at 37.4% UR)** or Los Angeles (**20.7 appointments/day at 50.14% UR).** Chicago's low-volume represents an opportunity for MakeSpace's stakeholders to focus resources on improving demand and utilization rates. New York's high-volume market is a great model to base Chicago's growth strategy upon, as New York's demographic and geographic characteristics are similar (i.e. suburban living, dense populations, receptive, trendy consumers). In addition, New York's utilization rate (**37.4%)** represents the most efficient model of utilized routes in terms of on-site duration; thus, stakeholders would be wise to leverage their scarce resources by implementing New York's winning business model in the context of Chicago. Based on the analysis and visualization of the queried data, the following markets behind Chicago that shareholders should prioritize improving are: Los Angeles and DC (where Los Angeles' current **UR** is the highest in the industry and is actively reducing efficiency).

My hypothesis for why each of the markets in the industry may outperform one another is highlighted by the demographic, geographic, and social factors that define each respective market. For instance, as MakeSpace's business was first founded in New York, [the New York market] has had the most time to develop and respond to the key external factors mentioned above (i.e. purchasing behaviors, Porter's 5.). If I had access to additional operations data, I would test this hypothesis by creating statistical models (i.e. regression, predictive analysis, DSA) which populate target consumer demographics and look for discrepancies by 'market' that point towards opportunities for growth.