Homework Assignment for Growth Analytics Platform Manager

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About me

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With 10+ years in data analysis and marketing, I specialize in scalable solutions and automation using tools like SQL and Python. I'm excited to support Bolt's mission by empowering Growth Analysts and driving efficiency.

2005
- Senior Software Developer

2010
- Senior Software Developer

2011
- 2011 – Senior Data Analyst
- 2012 - Data and CRM Specialist
- 2014 - Lead Generation Specialist
- 2016 - Email Marketing Specialist

2018
- 2018 - Digital Marketing Strategist
- 2022 - Global Innovation Strategist
- 2023 - Global AdTech Strategist

2024
- Data & CRM Expert

1. Peak Hour Problem

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Considerations

- The main challenge in this homework was interpreting the dataset, its definitions, and its practical application. Below is the logic I used for calculating the main metrics:

  - **Demand** is the total users requesting rides, calculated as unmet demand (users who saw 0 cars) plus met demand (users who saw +1 cars). **Supply** represents driver availability, based on users who saw at least one car.

  - To calculate **Additional Hours Needed**, I first determined **Coverage per Online** (Field ID 20), showing coverage achieved per driver hour, then calculated the **Coverage Deficit** (Field ID 21) as the gap to the 100% threshold. Using these, I computed **Additional Hours Needed** (Field ID 22) by dividing the deficit by coverage efficiency. Finally, I verified accuracy by checking the new coverage ratio, now at 100%.

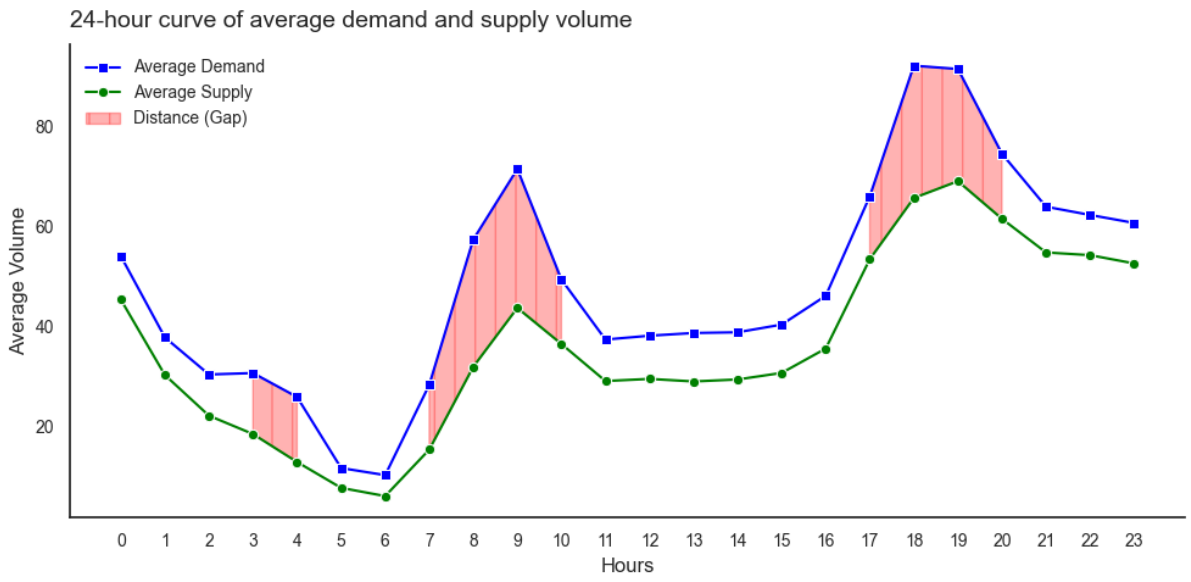
  - The **Compensation** is the difference between the Guaranteed Income, calculated using hourly guarantees based on the **Hour Rate** (Driver Income / Online (h)) and **Total Required Hours** (Online (h) + Additional Hours Needed), and the actual Driver Income.

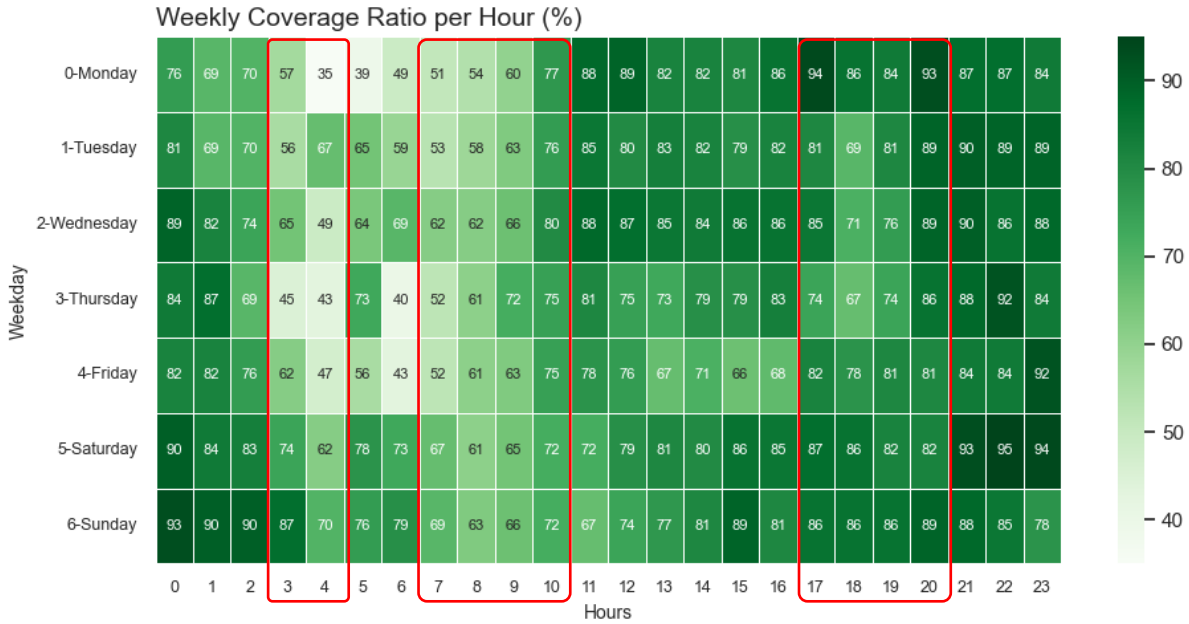
- The next slide presents the calculated fields along with their descriptions.

FIELD ID	FIELD NAME	DESCRIPTION	FORMULA	SAMPLE
1	**Date_Hour**	Date and hour		2016-12-18 23
2	**Date**	Date of the event		12/18/2016
3	**Hour**	Hour of the event		23
4	**Weekday**	Day of the week (numeric)		6
5	**Weekday Name**	Day of the week (text)		Sunday
6	**Month**	Month (numeric)		12
7	**Month Name**	Month (text)		December
8	**Active drivers**	Number of active drivers (any level of activity) available		52
9	**Online (h)**	Total supply hours available	Has booking (h) + Waiting for booking (h)	11 + 6 ≈ 18
10	**Has booking (h)**	Total hours when drivers had a client booking (any state)		6
11	**Waiting for booking (h)**	Total hours which drivers spent waiting for booking		11
12	**Hours per active driver**	Average number of hours each driver was online	Online (h) / Active drivers	18 / 52 = 0.3
13	**Rides per online hour**	Average finished trips per online hour	Finished Rides / Online (h)	12 / 18 = 0.67
14	**Finished Rides**	Number of finished trips		12
15	**People saw 0 cars (unique)**	Number of users who did not see a car		9
16	**People saw +1 cars (unique)**	Number of users who saw at least a car		32
17	**Coverage Ratio (%)**	Proportion of users who saw at least a car	People saw +1 cars (unique) / Total People	32 / 41 = 78%
18	**Demand**	Total demand	People saw 0 cars (unique) + People saw +1 cars (unique)	32 + 9 = 41
19	**Supply**	Total supply	People saw +1 cars (unique)	32
20	**Coverage per Online**	Coverage per online hour	Coverage Ratio (%) / Online (h)	78 / 18 = 4.33
21	**Coverage Deficit**	Deficit in coverage	Coverage Threshold - Coverage Ratio (%)	100 - 78 = 22
22	**Additional Hours Needed**	Additional hours needed to reach full coverage	Coverage Deficit / Coverage per Online	22 / 4.33 ≈ 5.08
23	**New Coverage Ratio**	Expected coverage ratio with additional hours	Coverage per Online * (Online (h) + Additional Hours Needed)	4.33 * (18 + 5.08) = 100
24	**Additional Rides**	Additional rides expected by solving missed coverage	People saw 0 cars (unique)	9
25	**Total Revenue**	Total revenue generated	Finished Rides * Average Finished Ride Value	12 * 10€ = 120€
26	**Driver Income**	Income earned by drivers (80% of total revenue)	Finished Rides * Average Finished Ride Value * Driver Share	12 * 10€ * 80% = 96€
27	**Hour Rate**	Driver income per online hour	Driver Income / Online (h)	96 / 18 ≈ 5.33
28	**Guaranteed Income**	Income guaranteed to drivers	Hour Rate * (Online (h) + Additional Hours Needed)	5.36 * (18 + 5.08) = 123.7€
29	**Compensation**	Compensation paid by the company to meet guaranteed income	Guaranteed Income - Driver Income	123.7 - 96 = 27.7€

**Calculated fields*

1. Critical Undersupply Periods: Analysis and Insights for Optimized Driver Availability

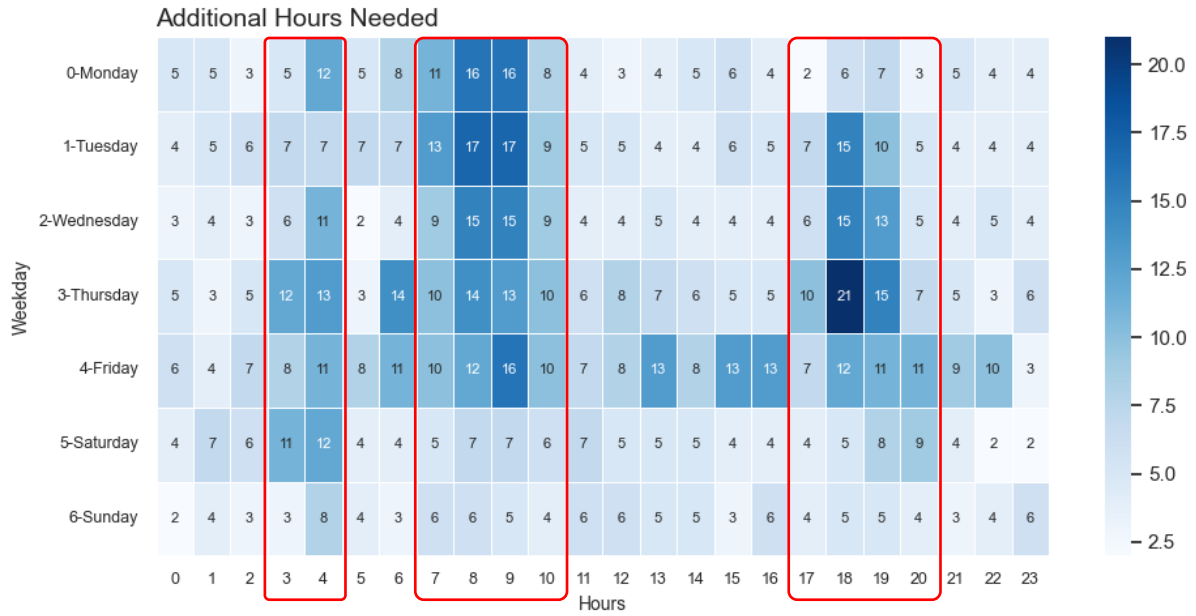




a. The chart highlights significant demand-supply gaps during early mornings (3-4 AM), morning commutes (7-10 AM), and evening peaks (5-8 PM), suggesting the need for targeted driver incentives to improve coverage and reduce missed opportunities.

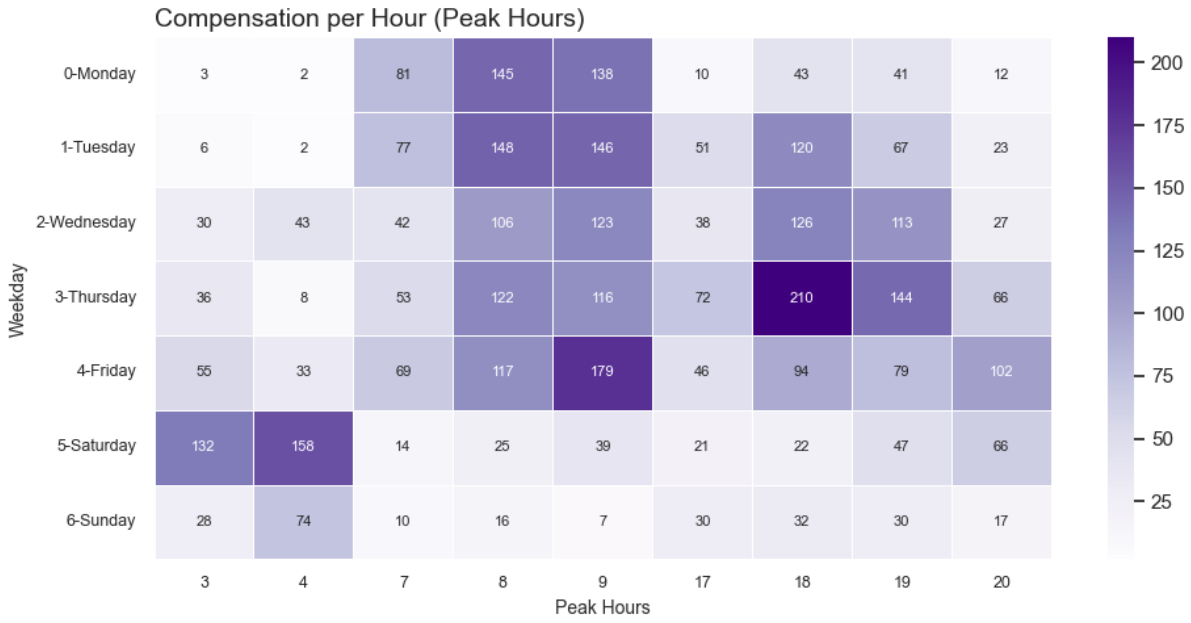
b. The weekly coverage ratio per hour chart illustrates the demand-supply gaps, emphasizing critical peak hours. This information can be shared with drivers to incentivize their availability during undersupplied periods. Targeted notifications and bonus structures during these hours can help improve coverage, reduce unmet demand, and enhance rider satisfaction.

2. Optimizing Coverage: Required Online Hours for Peak Periods



The chart illustrates the required additional online hours to achieve a 100% coverage ratio. It highlights the critical undersupplied periods, enabling us to target specific hours where driver availability is insufficient. By incentivizing drivers during these times, we can close the demand-supply gap, improve service quality, and ensure rider satisfaction. Additionally, this data can guide the optimization of operational strategies, such as adjusting guaranteed income schemes or deploying targeted promotions.

3. Guaranteed Earnings Analysis: Attracting Drivers During Peak Hours



The chart shows compensation per hour during peak periods, illustrating how guaranteed income attracts drivers during undersupplied hours. For example, on Friday at 9 AM, a compensation of €179 ensures that if a driver's earnings fall short, Bolt pays the difference, motivating drivers to stay active and reducing coverage gaps. Aligning incentives with demand peaks improves rider satisfaction and operational efficiency.

2. Scaling Growth Analytics Operational Support

Challenges and Recommended Approach

CURRENT SITUATION

- Bolt operates in 50+ countries and 600 cities.
- Growth Analysts manually manage campaigns for only 100 cities.
- The remaining 500 cities lack automated campaign execution.
- Headcount constraints limit scaling manual efforts.
- Need an automated solution to support rider discounts and driver bonuses efficiently.

PROPOSED SOLUTION

- Campaign Management Platform Implementation
- A scalable solution to ensure scalability, efficiency, and market growth through:
    - **Dynamic Incentives**: Automates rider discounts and driver bonuses to address demand-supply gaps.
    - **Optimized Allocation**: Targets high-value users using segmentation to maximize ROI.
    - **Monitoring**: Real-time dashboards and alerts for tracking campaign performance.
    - **Continuous Improvement**: Feedback loops, A/B testing, and model updates to refine strategies.

Necessary Considerations and Teams to Involve

DEMAND-SUPPLY DYNAMICS

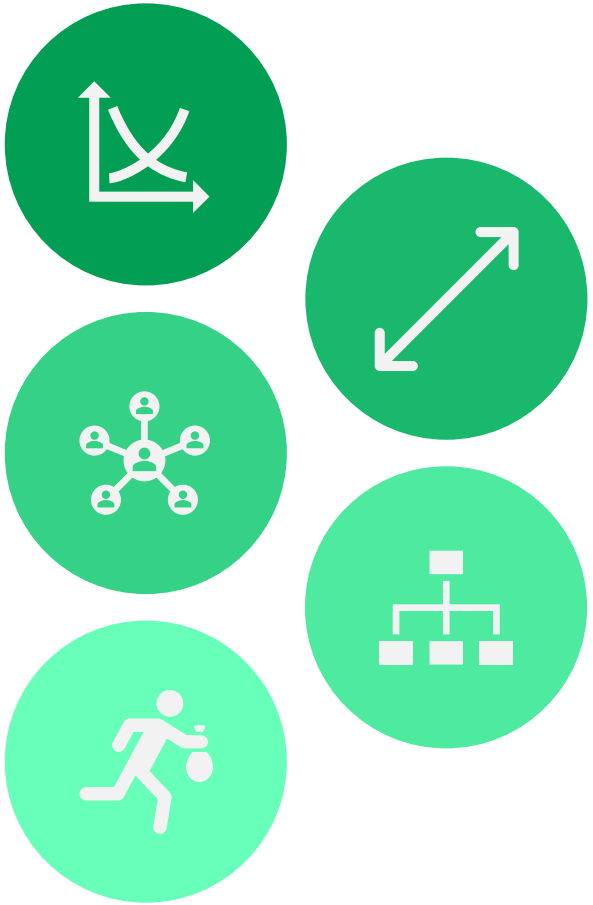
Automate incentives based on real-time data to address peak demand or supply shortages effectively.

USER SEGMENTATION

Target high-value riders and active/inactive drivers with tailored discounts or bonuses.

FRAUD PREVENTION

Implement caps and anomaly detection to minimize misuse of campaigns.



SCALABILITY AND COMPLIANCE

Adapt campaigns to local market conditions while ensuring legal and regulatory compliance.

TEAMS TO INVOLVE

Data Science, Engineering, Marketing, Product, Legal, and Operations for end-to-end automation and monitoring.

Campaign Management Platform Design and Features

PLATFORM DESIGN

- **Dynamic Templates**: Predefined, adjustable templates for discounts and bonuses.
- **Real-Time Data Integration**: Continuously update campaigns based on demand-supply dynamics.
- **Scalable Architecture**: Cloud-based system to manage 500+ cities efficiently.
- **Fraud Prevention**: Built-in anomaly detection and usage caps for incentives.
- **Performance Dashboards**: Visualize metrics like ROI, engagement, and demand-supply gaps.

MONITORING AND INTERVENTION MECHANISMS

- **Real-Time Alerts**: Identify underperforming campaigns or anomalies automatically.
- **Dynamic Adjustments**: Adjust incentives during peak hours or based on demand-supply gaps.
- **Fraud Detection**: Spot and mitigate incentive misuse with anomaly algorithms.
- **Engagement Metrics**: Track rider and driver activity to evaluate campaign effectiveness.
- **Manual Overrides**: Allow analysts to intervene in unforeseen local events or market dynamics.

Key Metrics for Performance Tracking

METRIC	PURPOSE	IMPORTANCE
Campaign ROI	Measure the cost-effectiveness of discounts and bonuses.	Ensures resources are allocated efficiently, identifies impactful campaigns, and maximizes return on investment.
Rider Engagement	Track acquisition, retention, and trip frequency.	Helps understand customer behavior, improve satisfaction, and build long-term loyalty.
Driver Activity	Monitor online hours, availability, and ride completions.	Maintains a balanced platform, ensures sufficient active drivers, and optimizes driver earnings and efficiency.
Demand-Supply Gaps	Assess service quality and coverage improvements.	Provides insights to close gaps, improving rider satisfaction, reducing wait times, and enhancing performance.
Market Share Growth	Evaluate competitive positioning and revenue impact.	Measures the success of growth strategies, monitors competitiveness, and ensures sustained expansion.

Continuous Improvement

PERFORMANCE REVIEWS

Continuously evaluate and adapt based on campaign outcomes

FEEDBACK LOOPS

Collect input from riders, drivers, and analysts for refinements

PLAYBOOK REFINEMENT

Document and share successful practices across markets

A/B TESTING:

Experiment with campaign parameters to identify optimal strategies

DATA-DRIVEN UPDATES

Regularly enhance segmentation and forecasting models

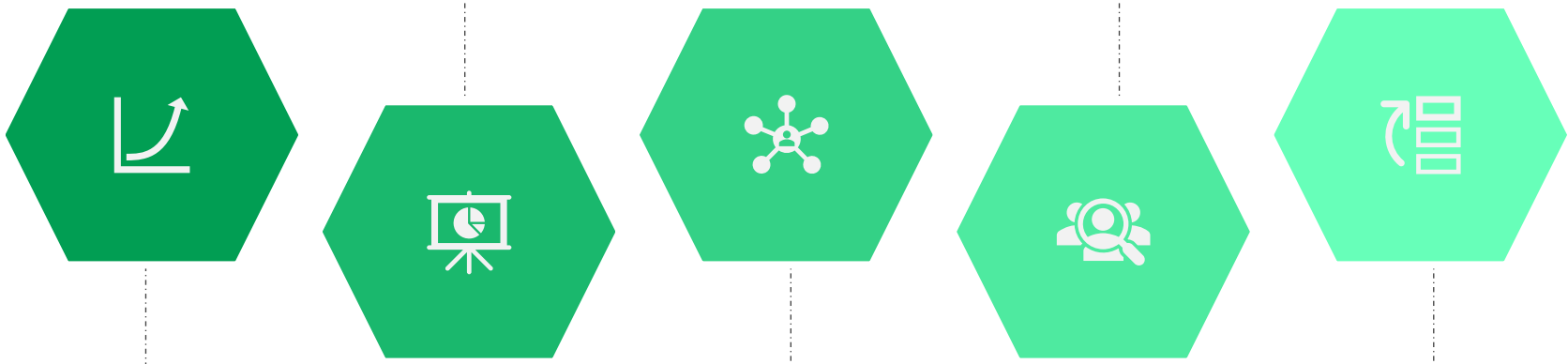
Measuring and Quantifying Project Impact

CAMPAIGN ROI

Assess the cost-effectiveness of discounts and bonuses.

MARKET SHARE

Track growth in rider and driver adoption rates.



REVENUE GROWTH

Compare revenue increases in automated vs. manual cities.

OPERATIONAL EFFICIENCY

Measure time saved by analysts through automation.

DEMAND-SUPPLY IMPROVEMENTS

Analyze reductions in service gaps and wait times.

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Conclusion and Next Steps

The Campaign Management Platform will automate campaign processes, driving scalability, enhancing efficiency, and fostering market growth.

NEXT STEPS:

PILOT PROGRAM

Test automation in a subset of 50 cities to validate the approach.

FEEDBACK INTEGRATION

Collect and analyze results to refine the platform and strategies.

PROGRESSIVE ROLLOUT

Gradually implement the solution across all 500 cities, leveraging insights from the pilot phase.

CONTINUOUS OPTIMIZATION

Regularly update models, playbooks, and workflows for long-term success.

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