Case 1

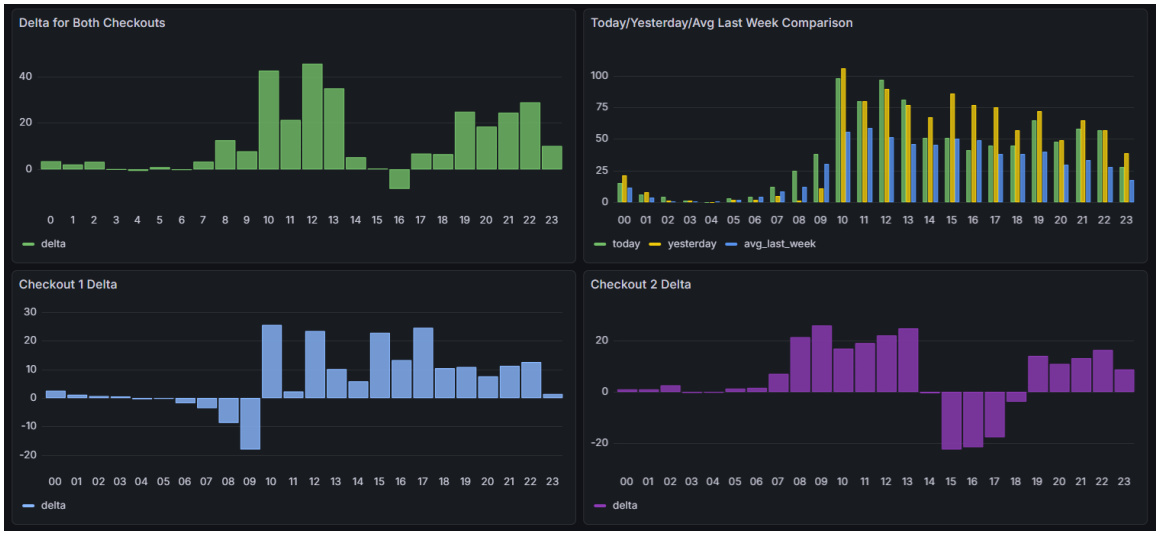
First, data from two CSV files (checkout_1 and checkout_2) were imported into a PostgreSQL database to facilitate structured querying and analysis. Each CSV contained hourly sales data, including sales from today, yesterday, and the average of previous days.

After importing the data, an SQL query was created to combine both checkouts and compare current sales against the average sales from the previous week. The query calculated a delta by summing the difference between today's sales and last week's average for both checkouts at each hour. This approach provided a consolidated view of deviations from normal behavior across both POS systems.

Using the result of this query, a time-series graph was plotted in Grafana to visually inspect anomalies. The visualization revealed a sustained increase in sales between 10:00 and 13:00, with values consistently above the weekly average, indicating elevated demand during this period. Additionally, a sharp drop in sales was observed at 16:00, falling well below the expected average. This abrupt deviation from historical behavior may indicate operational disruptions, technical issues, or data ingestion anomalies.

To complement this analysis, an additional graph was created comparing today's sales with yesterday's sales and the previous week's average. This comparison showed that yesterday exhibited a similar increase in sales during the same time window between 10:00 and 13:00. The recurrence of this pattern suggests that the elevated activity may be driven by an ongoing sale, promotion, or external event rather than an isolated anomaly. In contrast, the sudden drop observed at 16:00 does not appear to follow this recurring pattern.

Finally, separate graphs were plotted for each CSV file, comparing each checkout individually against its respective weekly average. By treating each CSV as an independent POS terminal, these isolated visualizations provided more granular insights. Notably, POS 2 exhibited a pronounced and sustained drop in sales between 15:00 and 17:00, reinforcing the hypothesis of a localized issue such as terminal malfunction, connectivity problems, or reduced staffing during that time window.


Delta for Both Checkouts
40
20
0
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23
delta
Today/Yesterday/Avg Last Week Comparison
100
75
50
25
0
00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23
today
yesterday
avg_last_week
Checkout 1 Delta
30
20
10
0
-10
-20
00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23
delta
Checkout 2 Delta
20
0
-20
00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23
delta