

Touchbistro x UW Problem Set

About TouchBistro

TouchBistro is an all-in-one restaurant management solution designed to help restaurateurs streamline operations, increase sales, and enhance the guest experience. Our software powers many of the bars and restaurants you know and love—especially across Canada and the United States.

We have a large presence in the Waterloo region, including near both the University of Waterloo and Wilfrid Laurier University. Here are just a few of the local favorites using TouchBistro:

- iPotato
- Kabob Shack
- Brown Donkatsu
- The Prohibition Warehouse
- Up Lounge
- Bodega Rose

Using TouchBistro, restaurants can:

- **Process Orders and Payments** seamlessly with our **Point of Sale (POS)** system.
- **Manage Backend Operations** such as inventory, staff scheduling, and menu engineering.
- **Build Customer Loyalty** programs to keep guests coming back.
- **Leverage Reporting and Insights** with powerful analytics dashboards that help them make data-driven decisions.
- **Grow Their Business** by integrating online ordering, reservations, and more.

[Visit our website](#) to learn more about how we are redefining the restaurant experience.

Dataset Overview

We've prepared a **bill-level dataset** (along with associated venue information) that reflects real-world transactions from restaurants using TouchBistro. The data includes:

- **Venue Details** (e.g., city, concept, operating hours)
- **Bills** (e.g., totals, taxes, payment info, timestamps)

Why is this interesting? Because you can explore **operational, financial, and customer behavior** insights all in one place. Whether you want to forecast sales, analyze tips, or see how

weather and holidays affect revenue, this dataset offers a window into the dynamics of the restaurant industry.

Hackathon Problem Statements

Below are some proposed problem statements you can tackle. Each suggestion includes an **Objective** and the **Key Fields** you'll need to solve it. You're welcome to choose one or combine multiple for a more comprehensive project.

Problem Statements

1. Peak Period Analysis & Staffing Recommendations

Objective

Determine the busiest time windows (e.g., by *order_seated_at_local* or *bill_paid_at_local*) at each venue and recommend optimal staffing levels to improve service efficiency

Key Fields

- `order_seated_at_local`
- `order_closed_at_local`
- `order_duration_seconds`
- `bill_uuid`
- `venue_xref_id`

2. Customer Spend Insights

Objective

Examine how order type (e.g., *dinein*, *takeout*, *delivery*) impacts the average bill size and tip amount.

Key Fields

- `order_take_out_type_label`
- `payment_total_tip`
- `order_duration_seconds` (*optional*)
- `bill_total_billed`
- `bill_uuid`

3. Forecasting Sales Revenue

Objective

Build a model to forecast daily or weekly *sales_revenue_with_tax* at the venue level. Explore seasonality (business_date, day of week) and venue attributes (city, concept, etc.).

Key Fields

- *business_date*
- *venue_xref_id*
- *city*
- *concept*
- *sales_revenue_with_tax*

4. Effect of Operational Offsets on Sales

Objective

Some venues start their “business day” early or late (*start_of_day_offset*). Explore whether this offset correlates with total daily sales, tips, or order volumes, potentially indicating different peak operational hours.

Key Fields

- *start_of_day_offset*
- *business_date*
- *bill_total_net*
- *bill_total_billed*
- *payment_total_tip*
- *venue_xref_id*

5. Waiter Performance Analysis

Objective

Identify which waiters (*waiter_uuid*) have the highest average check sizes or tip percentages. This can be done primarily with bill-level data (who closed the bill, how much was paid, tip amount).

Key Fields

- *waiter_uuid* (*linked to each bill*)
- *bill_total_billed*
- *payment_total_tip*

6. Weather Data Correlation

Objective

Correlate daily sales or traffic with external weather data (e.g., temperature, precipitation) for each venue city. For instance, do rainy days yield more delivery orders? Do sunny days boost dine-in traffic?

Key Fields

- `business_date`
- `bill_total_billed`
- `order_take_out_type_label`
- `city`
- `venue_xref_id`

Additional Data Needed

- Publicly available weather API or historical weather dataset keyed by city/date (e.g., from local government or services like OpenWeatherMap)

7. Holiday or Day-of-Week Impact on Sales

Objective

Examine how total daily sales vary during different holidays or days of the week. Also explore whether weekends generate higher net sales, tips, or gratuities compared to weekdays.

Key Fields

- `business_date`
- `bill_total_billed`
- `bill_total_net`
- `payment_total_tip`
- `order_take_out_type_label`
- `venue_xref_id`
- External holiday calendars (e.g., from public datasets)

8. Tip Culture by Geo

Objective

Investigate how tipping behaviors vary across different geographic locations. Compare average tip amounts or tip percentages ($\text{tip} \div \text{billed amount}$) by city and country to see if there are notable regional differences. Look for correlations with venue attributes, order types, and other factors that might influence tipping culture.

Key Fields

- `payment_total_tip`
- `bill_total_billed` (or `bill_total_net`)
- `venue_xref_id`
- `city`
- `country`

9. Comparing Public Inflation Data and Sales

Objective

Evaluate how changes in local or national inflation rates (from publicly available data) correlate with sales revenue, average check size, or net revenue. Explore whether venues in regions with higher inflation rates see different spending patterns, such as smaller average bills or lower tip percentages.

Key Fields

- `business_date`
- `bill_total_billed`
- `bill_total_net`
- `sales_revenue_with_tax`
- `city`
- `country`

External:

- Monthly or quarterly inflation index data by city or country (from sources such as government agencies or global financial institutions)

Final Thoughts

We invite you to explore any of these problem statements—or craft your own! Whether you focus on operational efficiency, customer behavior, or external influences like weather and inflation, the dataset provides a rich playground for data-driven insights.

Good luck, and we look forward to seeing your innovative solutions!