

Junior Fullstack - Hands-On Exercise

Background

Placer.ai provides analytics about real-world places. In this exercise, you'll be working with a dataset of **Big Box Stores across the U.S. from October 2023**. Your goal is to build a small fullstack application that reads this dataset and presents insights in a **dashboard-style report**.

You'll implement a backend API, a frontend UI, and enhance the experience with features of your own design.

What You'll Build

1. A **backend** that reads and serves data from a database
 2. A **frontend** that displays the data in a paginated, filterable table
 3. **Additional** visualizations, widgets, search, or analysis features
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Part I: Backend API

Use **Node.js** or **Python** to build a backend that will:

1. Browse and Filter POIs

- Serve paginated lists of venues (Points of Interest)
- Allow filtering by common fields such as:
 - Chain name (e.g., Walmart, Target)
 - Category
 - DMA (Designated Market Area)
 - City or State
 - Open/closed status (if implemented)

2. Summarize & Aggregate Metrics

- Provide summary statistics for use in dashboard chart / table
 - Total number of venues
 - Total foot traffic
- These stats should reflect any filters applied (e.g., if filtered to a specific chain or region)

Implementation Notes

- You can choose how to store and serve the data—whether using a database, a lightweight in-memory query layer, or file-based access.
 - Your design decisions should be **justified and easy to explain**. We'll be more interested in your reasoning than in any specific tech choice.
 - REST or GraphQL are both acceptable approaches.
 - Feel free to use any backend framework or library you're comfortable with (Flask, FastAPI, Express, etc.).
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Part II: Frontend – Report Dashboard

Create a simple dashboard UI using **React**

Mandatory Features

Your app **must include**:

1. Paginated, Filterable POI Table (see Appendix B for an example)

- Columns: `name`, `chain_name`, `category`, `dma`, `city`, `state`, `visits`, `is_open`
 - Filters for: `chain_name`, `dma`, `category`
 - Pagination controls (client-side or server-side)
 - Include a toggle or filter to show only POIs that are currently open
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Optional Enhancements (Select One or More — or Invent Your Own!)

We encourage you to think creatively and go beyond the minimum. Select one or more of the following (or add your own ideas):

Visualization & Metrics

- **Auto Complete**

Implement autocomplete functionality on key fields such as **name**, **address**, **state**, and others. As the user types a partial query (e.g., “wa”), the interface should return matching results like:

- **"Walmart"** (name)
- **"Washington"** (state name)
- **"WA"** (state code)
- **"15 Walnut St"** (address)

You may choose the fields, logic, and matching strategy but the experience should feel responsive and intuitive to the user.

- **DMA Heatmap on a Map**

Show visit density (total number of visits) per DMA using a map overlay for a chosen POI

- Use free technologies like **MapLibre** or **OpenLayers**
- **Mapbox** is also allowed with a free-tier account—just mind usage limits.

- **Calculate New Ranking Metrics**

- Foot traffic per sales (FT/Sales)
- Foot traffic per Census Block Group (CBG) population
- Foot traffic per zip code population

Intelligence & UX

- **Smart Search Filter**

Using LLM (or any other machine learning model) allow a user to type a question which will return only relevant list of POIs

Permissions & Access Control

- **User DB with Role-Based Access**

Create simple user authentication. Control access to certain metrics by user role (e.g., sales vs. marketing)

Utilities

- **CSV Export**

Add a button to export filtered POIs

In real life, datasets may have **millions of rows**. Handle large export workloads

gracefully on the backend side

- **Infinite Scroll or Advanced Sorting**
Improve the UX for large table datasets
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Evaluation Criteria

You'll be evaluated on:

- Clear, consistent code structure
- Functional backend + frontend integration
- Usable and clean UI
- Thoughtful choices in UX and filters

Bonus Points For:

- Insightful visualizations or features
 - Creative enhancements
 - Handling edge cases or large datasets
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Presentation & Wrap-Up

At the end of the day, you'll present your project. You don't need to finish everything—just explain what you accomplished, where you stopped, and how you would extend it with more time.

Appendix: A -

Glossary of Terms

CBG – *Census Block Group*

A geographic unit used by the U.S. Census Bureau, typically containing 600–3,000 people. It's a sub-division of a Census Tract and often used to approximate neighborhood-level analytics.

DMA – *Designated Market Area*

A TV/media market region defined by Nielsen, typically used to group metro areas by shared media coverage and population.

POI – *Point of Interest*

A physical location in the world that people can visit — typically a business, venue, store, or facility.

Examples: Walmart Supercenter, Starbucks, Target, etc.

Visits / Foot Traffic

Anonymized, privacy-safe counts of visits to a given POI over a time period. Represents aggregated mobile device movement data processed and modeled by Placer.ai.

Chain Name

The brand associated with the POI (e.g., Walmart, Target). Different locations can share the same chain.

Category

The business type or industry classification of the POI. Examples include “Retail,” “Grocery,” “Fitness,” “Restaurant,” etc.

Appendix B

Filters

Chain

Walmart

DMA

Ali

Is Open

All

Search

Name	Chain Name	Category	DMA	City	State
Example POI 1	Walmart	Retail	New York	New York	NY
Example POI 2	Walmart	Retail	Rogier	Los Angel	CA
Example POI 3	Walmart	Retail	Dews York	Chicago	NY
Example POI 4	Walmart	Retail	San Francis	New York	CA
Example POI 5	Walmart	Retail	San Francis	Chicago	IL
Example POI 6	Walmart	Retail	Los Angeles	Oew York	NY
Example POI 7	Walmart	Retail	Chicago	Example	NV

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Appendix C

Column	Description
entity_id	A unique identifier for the venue or POI (Point of Interest). This is used as the primary key for the location.
entity_type	Describes the type of entity. In your sample all are "venue", meaning it's a single physical location/store.
name	The name of the venue. Typically reflects the brand or store signage (e.g., Walmart, Target).
foot_traffic	The total number of visits recorded at this

	POI over a defined period (likely October 2023). A key metric for physical-world activity.
sales	Represents the total sales revenue generated by the venue over the observed time period, measured in U.S. dollars
avg_dwell_time_min	The average time (in minutes) that visitors spent at the venue. Useful to distinguish between quick trips vs. extended stays.
area_sqft	The estimated square footage of the physical location. Important for normalizing traffic or estimating density.
ft_per_sqft	Derived metric: foot traffic divided by square footage . Indicates space utilization or "traffic density". High value = crowded or highly active per square foot.
geolocation	The latitude and longitude of the POI in WKT (Well-Known Text) format. Allows mapping or spatial joins.
country	Country where the POI is located. Always "United States" in this dataset.
state_code	Two-letter abbreviation of the U.S. state (e.g., TX, PA).
state_name	Full name of the U.S. state (e.g., Texas, Pennsylvania).
city	The city where the POI is located, often used for filtering or aggregating metrics.
postal_code	The postal (ZIP) code of the location. Used for neighborhood-level comparisons.
formatted_city	A standardized version of city , possibly used for display or aggregation consistency.
street_address	The full street address of the POI, useful for display and search/autocomplete.
sub_category	Classification of the store type—e.g., "Big Box Store" could also include categories like "Grocery" or "Home Improvement". Helps in segmentation and filtering.
dma	Nielsen's Designated Market Area ID.

	Represents the regional media/consumer market this POI belongs to. Useful for regional comparisons.
cbsa	Core-Based Statistical Area ID—another geographic classification used by the U.S. Census. Often represents metro areas.
chain_id	Unique identifier for the chain or brand (e.g., Walmart). Allows grouping all stores under one company.
chain_name	Name of the chain brand (e.g., Walmart, Target, Big Lots).
store_id	Identifier for this individual store within the chain .
date_opened	The store's opening date (if available). Useful for filtering legacy vs. new locations.
date_closed	The store's closure date (if applicable). If blank, the store is likely still open.