Junior Software Engineer: Take Home Assignment

Shipment Quote Calculator

The Problem

Build a simple shipment quoting tool where a freight broker can input shipment details and get an instant rate quote. Include a basic quote history view.

Minimum Requirements

Frontend:

- Form to capture: lane (origin/destination pair), equipment type (dry van, reefer, flatbed), total weight, pickup date
- Display calculated quote with breakdown
- List view of previous quotes with basic filtering

Backend:

- REST API with 2-3 endpoints (create quote, get quotes, calculate rate)
- Rate calculation logic: base rate per mile + equipment multiplier + weight factor
- Data persistence (can be in-memory, SQLite, PostgreSQL, or your own choice)

IMPORTANT: The application **must** run with just `npm run dev` after an `npm install` (or `pnpm` or `yarn` equivalent) without having to install any other dependencies (unless it runs on Docker containers, which should also be part of the `npm run dev`).

How to do well:

- Ensure the code runs without errors and is well-documented.
- Use AI Coding Assistants if you want, but be prepared to discuss the assignment.
- Take the use case beyond the base requirements: How can this be enhanced? What features would make the tool more useful? Some ideas:
    - Lane (origin and destination pair) suggestions and recommendations
    - More variables in the rating engine, such as:
        - Fuel surcharge
        - Accessorials (i.e. tailgate, appointment, etc)
    - Rate insights
    - AI automation

- Understand your technical choices, use modern libraries, and maintain good DX.

Sample Data:

- This does not need to be used; it is a starting point/example.

Example city pairs and base rates CSV:

origin_city,origin_province,origin_postal,destination_city,destination_province,destinatio
n_postal,base_rate,distance_km,transit_days
Toronto,ON,M5H 2N2,Montreal,QC,H3B 4W8,520.00,541,1
Vancouver,BC,V6B 1A1,Calgary,AB,T2P 2M5,680.00,972,2
Montreal,QC,H3B 4W8,Ottawa,ON,K1P 1J1,380.00,199,1
Calgary,AB,T2P 2M5,Edmonton,AB,T5J 2R7,420.00,299,1
Toronto,ON,M5H 2N2,Ottawa,ON,K1P 1J1,450.00,450,1
Vancouver,BC,V6B 1A1,Victoria,BC,V8W 1P6,280.00,115,1
Winnipeg,MB,R3C 3H8,Regina,SK,S4P 3Y2,480.00,571,2
Halifax,NS,B3J 1S9,Moncton,NB,E1C 8R9,340.00,262,1
Quebec City,QC,G1R 4P5,Montreal,QC,H3B 4W8,320.00,253,1
Toronto,ON,M5H 2N2,Windsor,ON,N9A 6S3,480.00,370,1
Edmonton,AB,T5J 2R7,Saskatoon,SK,S7K 1M3,520.00,525,2
Vancouver,BC,V6B 1A1,Kelowna,BC,V1Y 1Z4,450.00,395,1
Ottawa,ON,K1P 1J1,Kingston,ON,K7L 2Z5,240.00,180,1
Calgary,AB,T2P 2M5,Vancouver,BC,V6B 1A1,680.00,972,2
Montreal,QC,H3B 4W8,Toronto,ON,M5H 2N2,520.00,541,1
Mississauga,ON,L5B 3C1,Hamilton,ON,L8P 4W9,190.00,45,1
Surrey,BC,V3T 4W4,Burnaby,BC,V5H 4M1,150.00,25,1
London,ON,N6A 5C1,Kitchener,ON,N2G 1C5,180.00,95,1
Quebec City,QC,G1R 4P5,Sherbrooke,QC,J1H 1Z1,220.00,155,1
St. John's,NL,A1C 5M3,Corner Brook,NL,A2H 6J8,380.00,684,2

Example equipment multipliers:
equipment_type, multiplier
dry_van, 1.0
reefer, 1.3
flatbed, 1.15

Example weight factor:
base rate + $0.10 per 100lbs over 10,000lbs