Group 5 (Caleb, Radik, Robbie)

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CS 1555

# Phase 1: Textual ER Diagram

## Entities:

1. **Station** (station_no, address, hours_of_operation)
2. **Rail Line** (line_no, speed_limit)
3. **Route** (route_no)
4. **Train** (train_no, top_speed, seats_available, price_per_mile)
5. **Passenger** (customer_ID, fname, lname, email, phone_no, address (number, street, city, state, zip))
6. **Ticket** (ticket_no)
7. **Clock** (p_date)

## Relationships:

1. **Passes Thru (SRL)** <Station, Rail Line> M:N, TOTAL/TOTAL, coordinate
2. **Passes Thru (SR)** <Station, Route> M:N, PARTIAL/TOTAL, coordinate
3. **Scheduled On** <Train, Rail Line> M:N, TOTAL/PARTIAL, date, start_time, end_time
4. **Takes Trip** <Train, Route, Ticket, Rail Line> 1:1:M:N, PARTIAL/PARTIAL/TOTAL/PARTIAL, date, time
5. **Books** <Passenger, Ticket> 1:M, TOTAL/TOTAL, agent

## Assumptions:

1. A ticket must be booked by a passenger for a given trip for the ticket to exist in database.
2. A route must pass through a station.
3. A station must be a part of a rail line for the station to exist in the database.
4. A train must be scheduled on a rail line and also be part of a distinct trip for the train to exist in the database.
5. The coordinate attribute of the two “Passes Thru” relationships keeps track of the distance between stations on the particular route or rail line.
6. One passenger may book multiple tickets.
7. A route may pass through multiple rail lines for a distinct trip.
8. Given a distinct schedule based on a unique date, start time, and end time, only one train can exist on a particular rail line. However, in general, multiple trains can be on the same rail line.