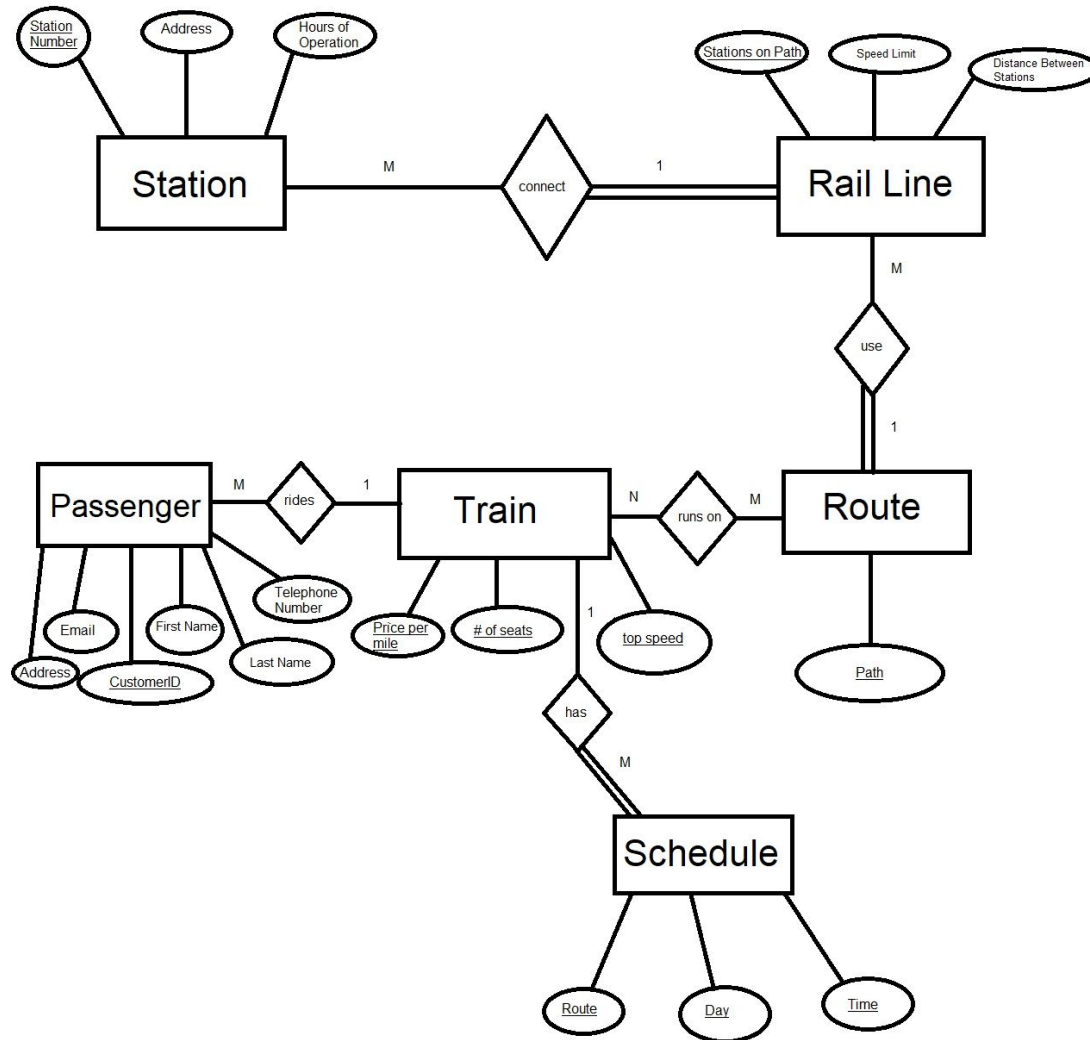


1. Refer to the ER diagram in ExpressRailwayERDiagram.jpeg if this image is unclear:



2. Transform the ER diagram from part 1 into relational schemas

### Entities

Station(Station Number, Address, Hours of Operation)

Rail Line(Stations on Path, Speed Limit, Distance Between Stations)

Route(Path)

Train(Price Per Mile, # of seats, Top Speed)

Schedule(Route, Day, Time)

Customer(CustomerID, First Name, Last Name, Email Address, Address, Telephone Number)

### Relationships:

1. stations <are connected by> rail lines M:1, PARTIAL/TOTAL
2. routes <use> rail lines 1:M, TOTAL/PARTIAL (a route can use one or more rail lines)
3. trains <run on> routes N:M, PARTIAL/PARTIAL (any train can run on any route)
4. trains<have>train schedules 1:M, PARTIAL/TOTAL
5. passenger<rides>trains M:1 PARTIAL/PARTIAL

### Relational Schema:

STATION(Station Number, Address, Hours of Operation)

RAIL\_LINE(Stations on Path, Speed Limit, Distance Between Stations, RAIL\_LINE Station Number)

FK(RAIL\_LINE Station Number) -> STATION(Station Number)

ROUTE(Path, Route Station Number)

FK(Route Station Number) -> STATION(Station Number)

TRAIN(Price Per Mile, # of seats, Top Speed)

SCHEDULE(Route, Day, Time)

CUSTOMER(CustomerID, First Name, Last Name, Email Address, Address, Telephone Number)

### Assumptions:

- None of train's attributes are unique, so all 3 must be used as a key. Same goes for Schedule. I was considering making train a weak entity that refers to schedule...
- Route is able to state the stations on the path and those station numbers included in its Path