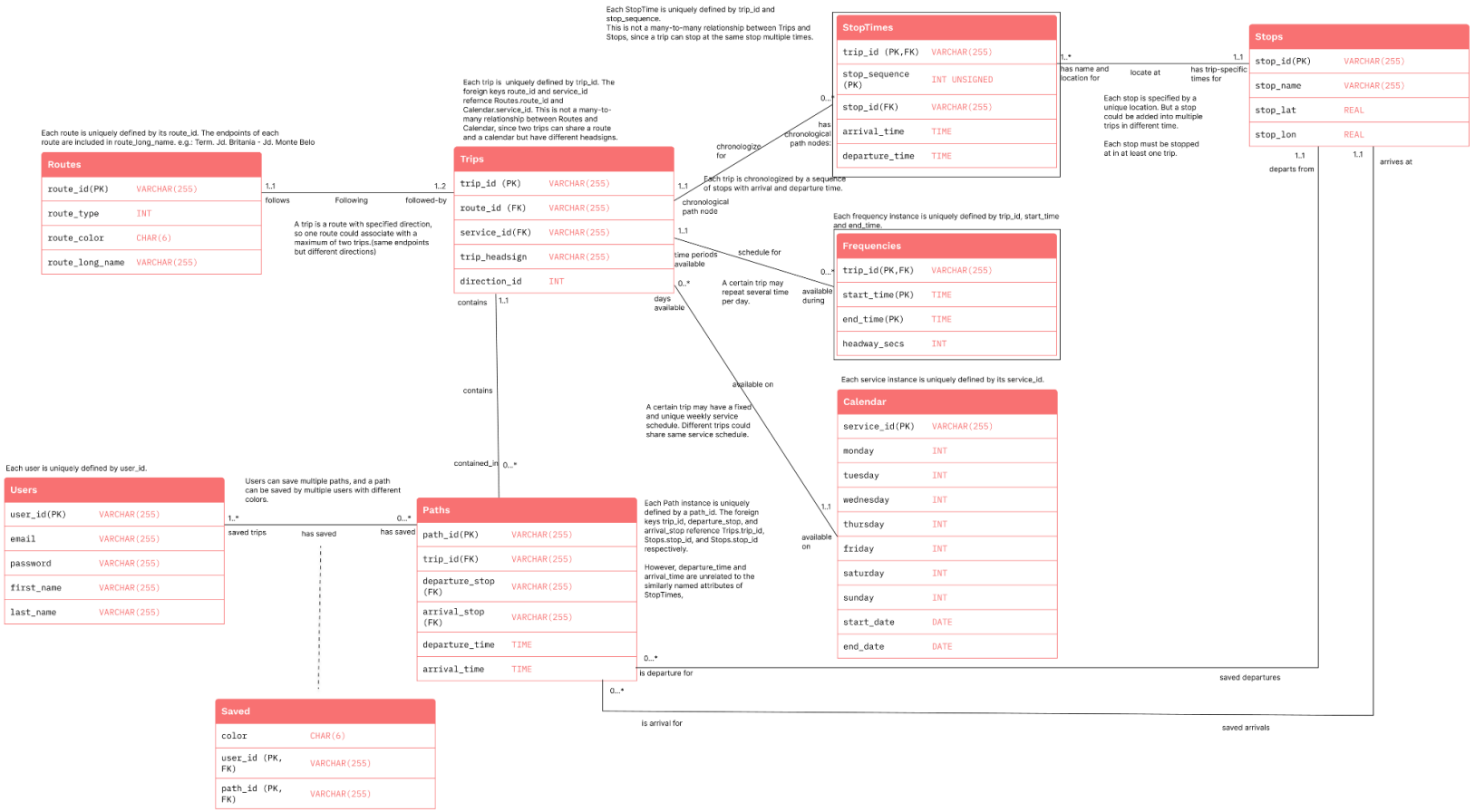
UML


Each StopTime is uniquely defined by trip_id and stop_sequence.
This is not a many-to-many relationship between Trips and Stops, since a trip can stop at the same stop multiple times.
StopTimes
trip_id (PK,FK) VARCHAR(255)
stop_sequence (PK) INT UNSIGNED
stop_id(FK) VARCHAR(255)
arrival_time TIME
departure_time TIME
1..*
has name and location for
locate at
1..1
has trip-specific times for
Each stop is specified by a unique location. But a stop could be added into multiple trips in different time.
Each stop must be stopped at in at least one trip.
Stops
stop_id(PK) VARCHAR(255)
stop_name VARCHAR(255)
stop_lat REAL
stop_lon REAL
1..1
departs from
1..1
arrives at
Each trip is uniquely defined by trip_id. The foreign keys route_id and service_id reference Routes.route_id and Calendar.service_id. This is not a many-to-many relationship between Routes and Calendar, since two trips can share a route and a calendar but have different headsigns.
Each route is uniquely defined by its route_id. The endpoints of each route are included in route_long_name. e.g.: Term. Jd. Britania - Jd. Monte Belo
Routes
route_id(PK) VARCHAR(255)
route_type INT
route_color CHAR(6)
route_long_name VARCHAR(255)
1..1
follows
Following
1..2
followed-by
A trip is a route with specified direction, so one route could associate with a maximum of two trips.(same endpoints but different directions)
Trips
trip_id (PK) VARCHAR(255)
route_id (FK) VARCHAR(255)
service_id(FK) VARCHAR(255)
trip_headsign VARCHAR(255)
direction_id INT
chronologize for
0...*
has chronological path nodes
1..1
chronological path node
Each trip is chronologized by a sequence of stops with arrival and departure time.
Each frequency instance is uniquely defined by trip_id, start_time and end_time.
Frequencies
trip_id(PK,FK) VARCHAR(255)
start_time(PK) TIME
end_time(PK) TIME
headway_secs INT
time periods available
schedule for
0...*
available during
A certain trip may repeat several time per day.
0...*
days available
contains
1..1
contains
Each service instance is uniquely defined by its service_id.
available on
A certain trip may have a fixed and unique weekly service schedule. Different trips could share same service schedule.
Calendar
service_id(PK) VARCHAR(255)
monday INT
tuesday INT
wednesday INT
thursday INT
friday INT
saturday INT
sunday INT
start_date DATE
end_date DATE
1..1
available on
Each user is uniquely defined by user_id.
Users
user_id(PK) VARCHAR(255)
email VARCHAR(255)
password VARCHAR(255)
first_name VARCHAR(255)
last_name VARCHAR(255)
Users can save multiple paths, and a path can be saved by multiple users with different colors.
1..*
saved trips
has saved
0...*
has saved
contained_in
0...*
Paths
path_id(PK) VARCHAR(255)
trip_id(FK) VARCHAR(255)
departure_stop (FK) VARCHAR(255)
arrival_stop (FK) VARCHAR(255)
departure_time TIME
arrival_time TIME
Each Path instance is uniquely defined by a path_id. The foreign keys trip_id, departure_stop, and arrival_stop reference Trips.trip_id, Stops.stop_id, and Stops.stop_id respectively.
However, departure_time and arrival_time are unrelated to the similarly named attributes of StopTimes,
0...*
is departure for
saved departures
0...*
is arrival for
saved arrivals
Saved
color CHAR(6)
user_id (PK, FK) VARCHAR(255)
path_id (PK, FK) VARCHAR(255)

Schema

Note: the INT values in Calendar and Trips can only be 0 or 1 in our dataset, but in general GTFS data they could have other values, hence INT

```
Routes(
      route_id: VARCHAR(255) [PK],
      route_type: INT,
      route_color: CHAR(6),
      route_long_name: VARCHAR(255)
)
Stops(
      stop_id: VARCHAR(255) [PK],
      stop_name: VARCHAR(255),
      stop_lat: REAL,
      stop_lon: REAL
)
Calendar(
      service_id: VARCHAR(255) [PK],
      monday: INT,
      tuesday: INT,
      wednesday: INT,
      thursday: INT,
      friday: INT,
      saturday: INT,
      sunday: INT,
      start_date: DATE,
      end_date: DATE
)
Frequencies(
      trip_id: VARCHAR(255) [PK, FK to Trips.trip_id],
      start_time: TIME [PK],
      end_time: TIME [PK],
      headway_secs: INT
)
Trips(
      trip_id: VARCHAR(255) [PK],
      route_id: VARCHAR(255) [FK to Routes.route_id],
      service_id: VARCHAR(255) [FK to Calendar.service_id],
      trip_headsign: VARCHAR(255),
      direction_id: INT
)
StopTimes(
      trip_id: VARCHAR(255) [PK, FK to Trips.trip_id],
      stop_sequence: INT UNSIGNED [PK],
      stop_id: VARCHAR(255) [FK to Stops.stop_id],
      arrival_time: TIME,
      departure_time: TIME
)
```

```
Users(
      user_id: VARCHAR(255) [PK],
      email: VARCHAR(255),
      password: VARCHAR(255),
      first_name: VARCHAR(255),
      last_name: VARCHAR(255)
)
Paths(
      path_id: VARCHAR(255) [PK],
      trip_id: VARCHAR(255) [FK to Trips.trip_id],
      departure_stop: VARCHAR(255) [FK to Stops.stop_id],
      arrival_stop: VARCHAR(255) [FK to Stops.stop_id],
      departure_time: TIME,
      arrival_time: TIME,
)
Saved(
      user_id: VARCHAR(255) [PK, FK to Users.user_id],
      path_id: VARCHAR(255) [PK, FK to Path.path_id],
      color: CHAR(6)
)
```