420 Database Design Final Project
Fall 2014

OreFun2014 Train Schedule Database

Benjamin Smith
&
Anna Therkelsen

Business Goals:

Mission

OreFun will simplify the search, selection, and purchase of train tickets for Oregon travelers.

Summary

OreFun is a new medium to allow users to view information in regards to many different kinds of train routes. The goal of this program is to offer an easy and effective way for potential passengers to view train schedules, routes, and maps for a local rail line across the state of Oregon. This business will develop a more efficient way for passengers to research the best possible train route for their desired trip based on their departing city of choice to a destination city of their choice. The business will be managed by Benjamin Smith and Anna Therkelsen, Co Managers and Chief Operating Officers.

Objectives

OreFun intends to server travelers in the state of Oregon with affordable transportation by train. OreFun will allow users to view train routes, schedules, stations, and most importantly allow them to purchase train ticket(s) based on specific times, dates, departing stations, and destination stations.

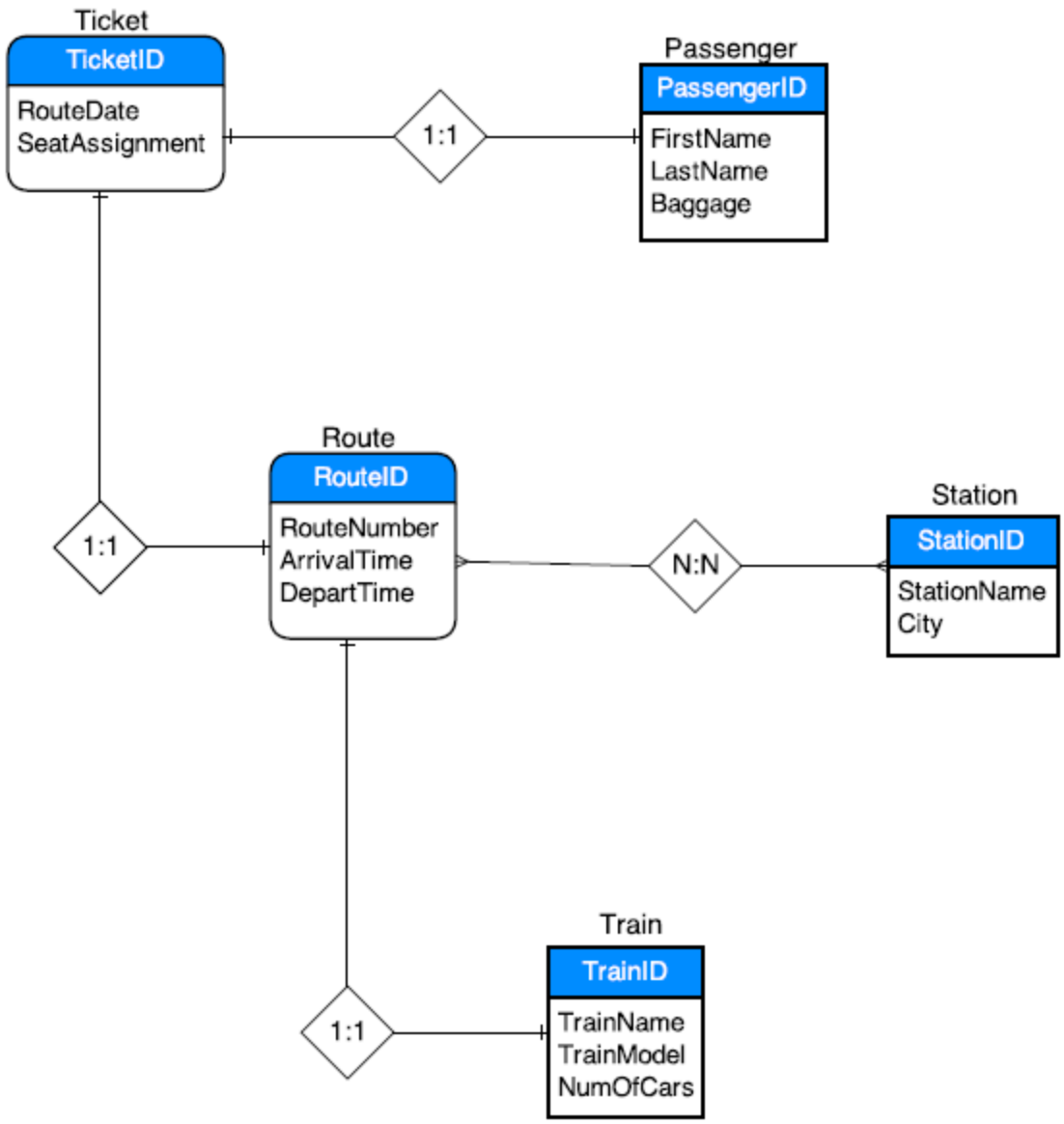
User Specifications:

We want the user to be able to view train routes, schedules, and stations as the project's basic functionality. Although, most importantly we want to allow users to purchase train ticket(s) based on specific times, dates, departing stations, and destination stations.

Questions our project is designed to answer (three or more):

1) What train(s) depart from station A?
2) What trains depart from a station before 11:00am on a specific date?
3) Can I get from station A to station B without switching trains?
4) How many passengers with bags checked will make a trip on a specific date?
5) Is station A located on route B?
6) What model of train will passenger A be riding on?
7) What is the route date for passenger A?
8) What city will train A be in at 12pm?
9) What is passenger A's seat assignment?
10) What passengers arrive at station A before a specific time?

The ER Diagram:



Queries that can be performed on our database:

1) This query returns all trains that have more than 4 cars.

```
SELECT *
FROM Train
WHERE NumOfCars > 4;
```

Results | Messages

	TrainID	TrainName	TrainModel	NumOfCars
1	1	BigBlue	DieselLocomotive	10
2	2	OldFaithful	SteamLocomotive	13
3	3	SilverStreak	BulletTrain	8
4	4	MidAir	MagLev	10
5	5	Thomas	SteamLocomotive	15

2) This query returns all of the cities that a bullet train has a route through.

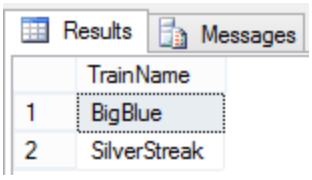
```
SELECT DISTINCT City
FROM Station JOIN Route ON Station.StationID = Route.StationID
WHERE TrainID IN
        (SELECT TrainID
        FROM Train
        WHERE Model = 'BulletTrain');
```

Results | Messages

	City
1	Eugene
2	Grants Pass
3	Keiser
4	Medford
5	Portland
6	Roseberg
7	Salem
8	Vancouver
9	Wilsonville
10	Woodburn

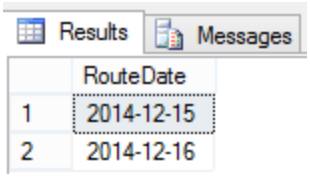
3) This query returns the names of all of the trains that have routes that pass through Salem.

```
SELECT TrainName
FROM Train
WHERE TrainID IN
        (SELECT TrainID
        FROM Route JOIN Station ON Station.StationID = Route.StationID
        WHERE City = 'Salem');
```



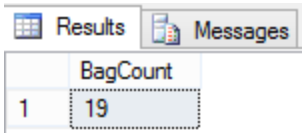
4) This query returns all of the route dates for a passenger with the last name of Smith.

```
SELECT DISTINCT RouteDate
FROM Ticket JOIN Passenger ON Passenger.PassengerID =
Ticket.PassengerID
  WHERE LastName = 'Smith';
```



5) This query returns the amount of passengers that have checked baggage that are traveling on the this particular date.

```
SELECT COUNT (*) AS BagCount
FROM Passenger
WHERE Baggage = 'true' AND EXISTS
        (SELECT *
        FROM Ticket
        WHERE RouteDate = '12/15/2014'
            AND PassengerID = PassengerID);
```



Work done for each development stage:

Our original design consisted of five tables: Train, Passenger, Station, Schedule, and Trips. The software used throughout the entire project has been SQL Server 2014 and Visual Studios 2013. After further investigation, we have altered some of the table's primary and candidate keys, as well as added a table for a train's Route. With this addition, it is able to provide more accurate information as to when a specific train is to arrive and depart from a station. This information is crucial for a passenger to purchase a ticket to a desired destination.

11/19/2014

Wrote up the rough and final draft for the user specifications and the 10 typical questions.

11/23/2014

Created the logical database based on the data entered into our tables in SQL Server.

11/24/2014

Began creating and testing SQL statements once all the data was entered into the database.

11/25/2014
Reworked tables, so that there are still 5 tables, but they consist of Passenger, Route, Station, Ticket, and Train. We also added descriptions to our queries and highlighted the appropriate text for the SQL statements. Entered in all of the data for route and ticket tables for the database.

11/26/2014
Completed the layouts/design for the three reports and finished typing up the business goal. We executed all of the queries to make sure they are all correct and took screenshots of all of the successfully returned queries.

11/29/2014
Created a graphic for the ER diagram and attached to the Google doc for the project. Added functionality to the application, so that users can view a map of all of the routes with a color coded legend. Also added dropdown menus for the forms and reports.

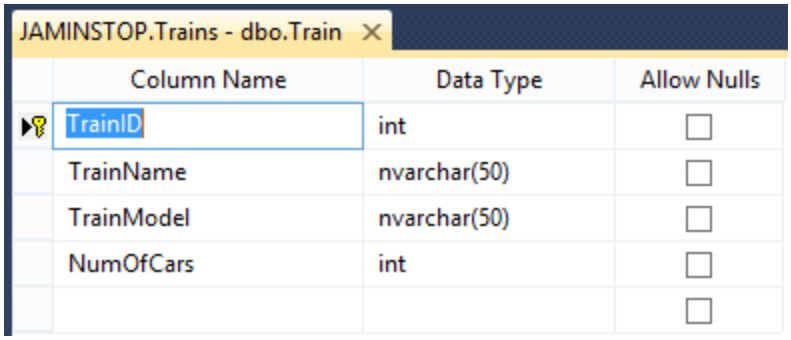
11/30/2014
Created the ER diagram and cleaned and recreated the logical database and applied the changes made in the ER Diagram and from previous redesigns.

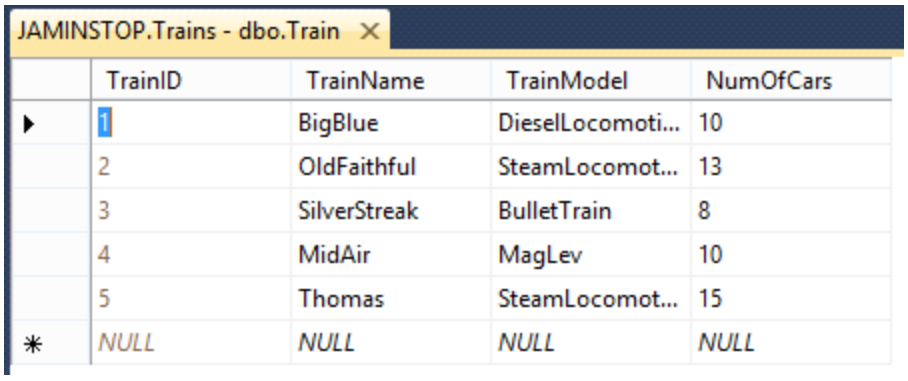
12/1/2014
Made Final changes to the ER Diagram and implemented final forms and reports for application.

Description of each table: *Just listing info then once thats all filled in, I will write in paragraph form. Also, I'm adding the logical database. I'm not sure if we need them but it might help when we need to determine the NF for each table*

Train
PrimaryKey - TrainID
Highest NF -

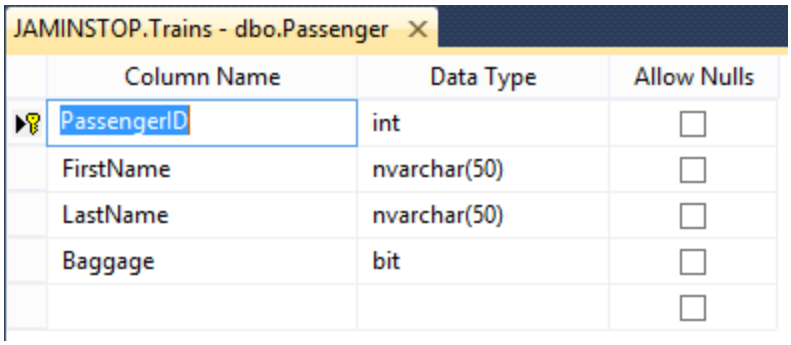
TrainID	TrainName	TrainModel	NumOfCars

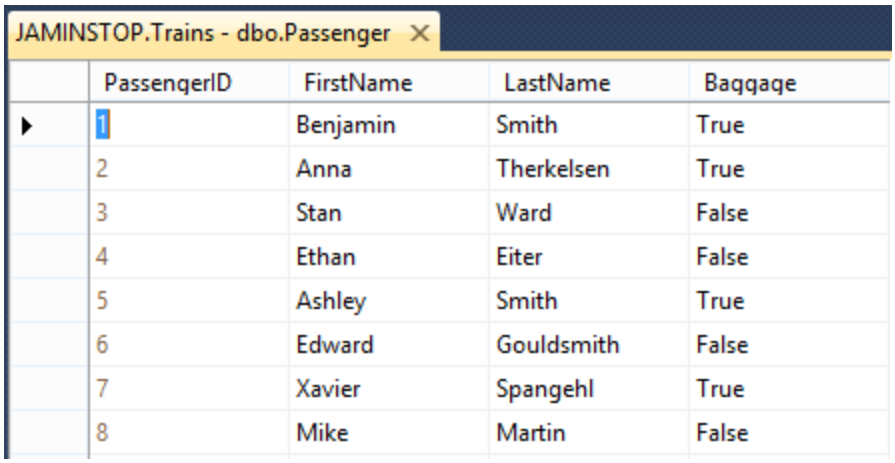




Passenger
PrimaryKey - PassengerID
Highest NF -

PassengerID	FirstName	LastName	Baggage



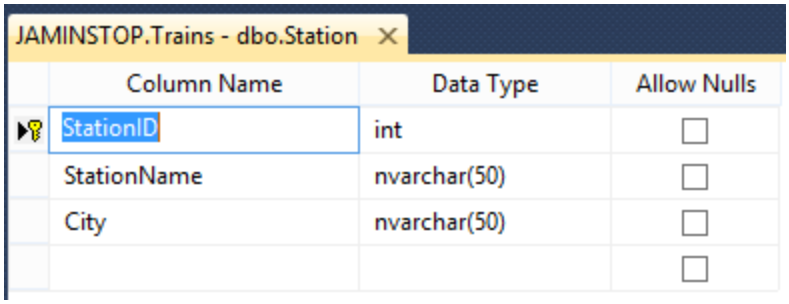


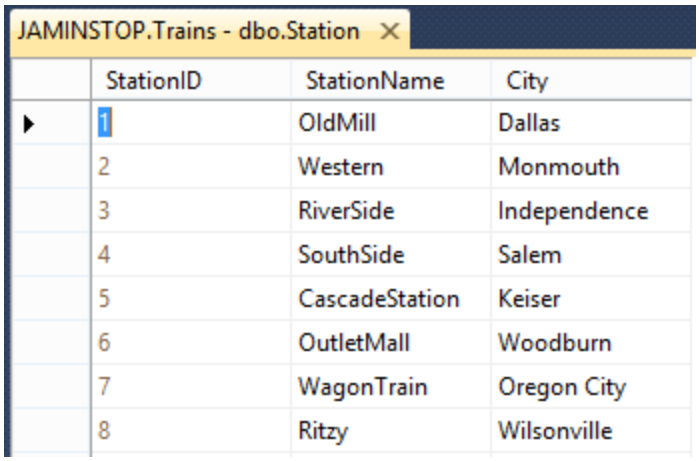
Station

PrimaryKey - StationID

Highest NF - 2NF (transitive dependency)

StationID	StationName	City



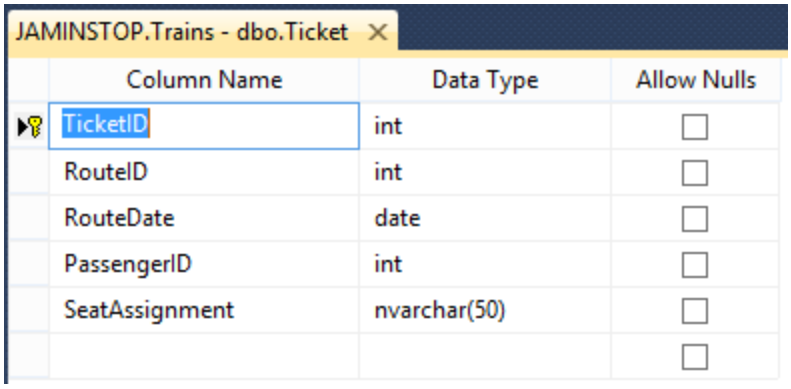


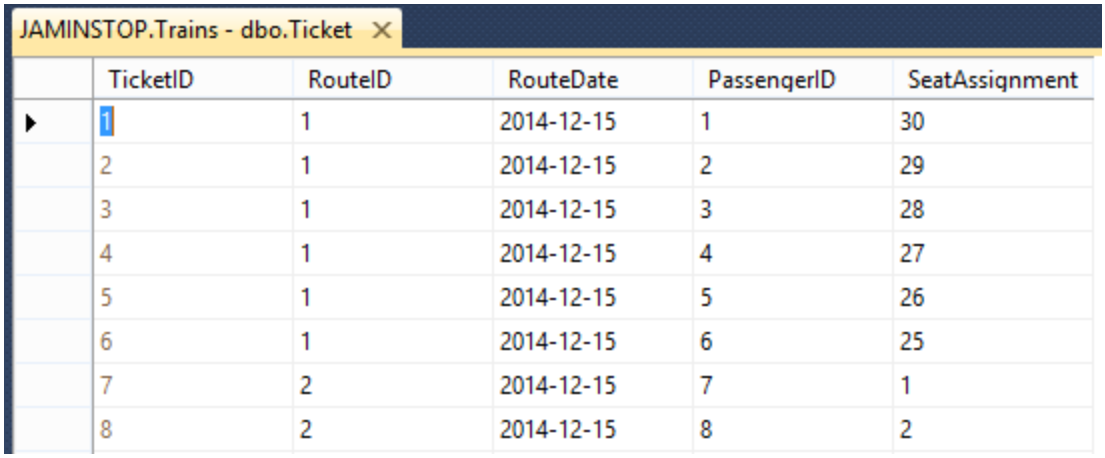
Ticket

PrimaryKey - TicketID

Highest NF -

TicketID	RouteID	RouteDate	PassengerID	SeatAssignment



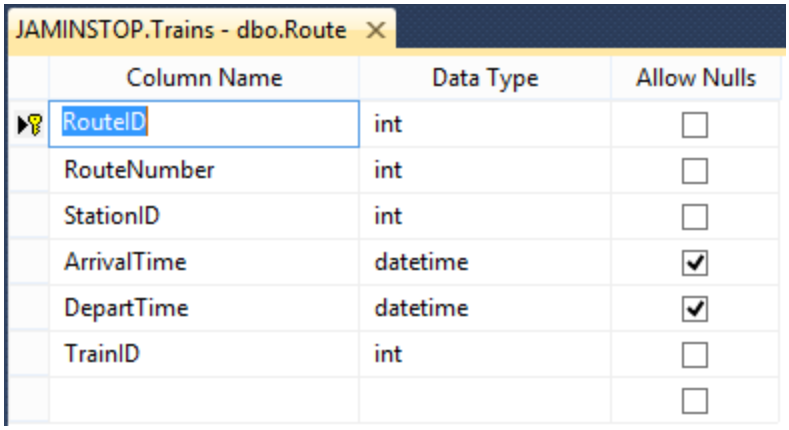


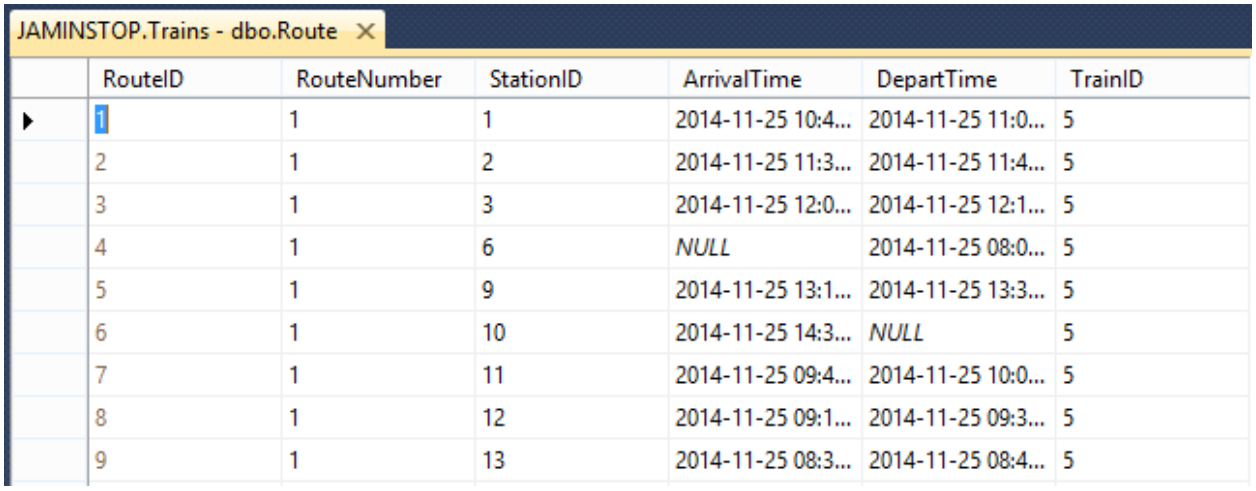
Route

PrimaryKey - RouteID

Highest NF -

RouteID	RouteNum	StationID	ArrivalTime	DepartTime	TrainID

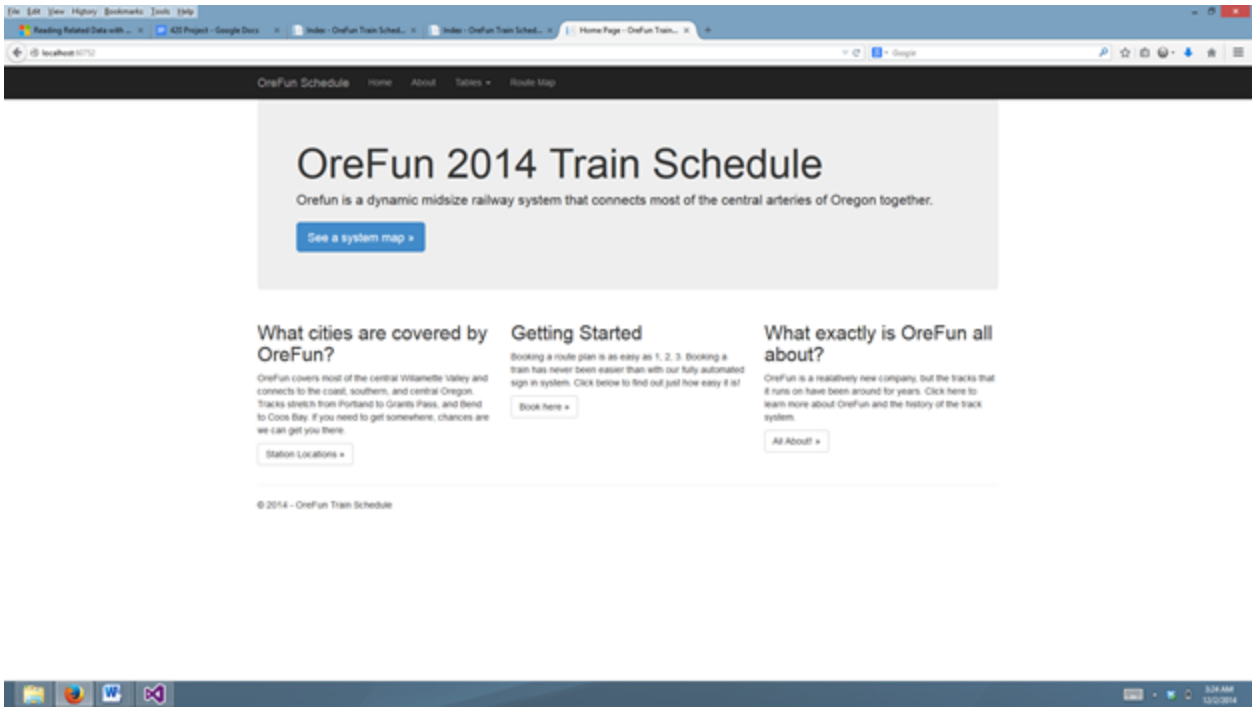


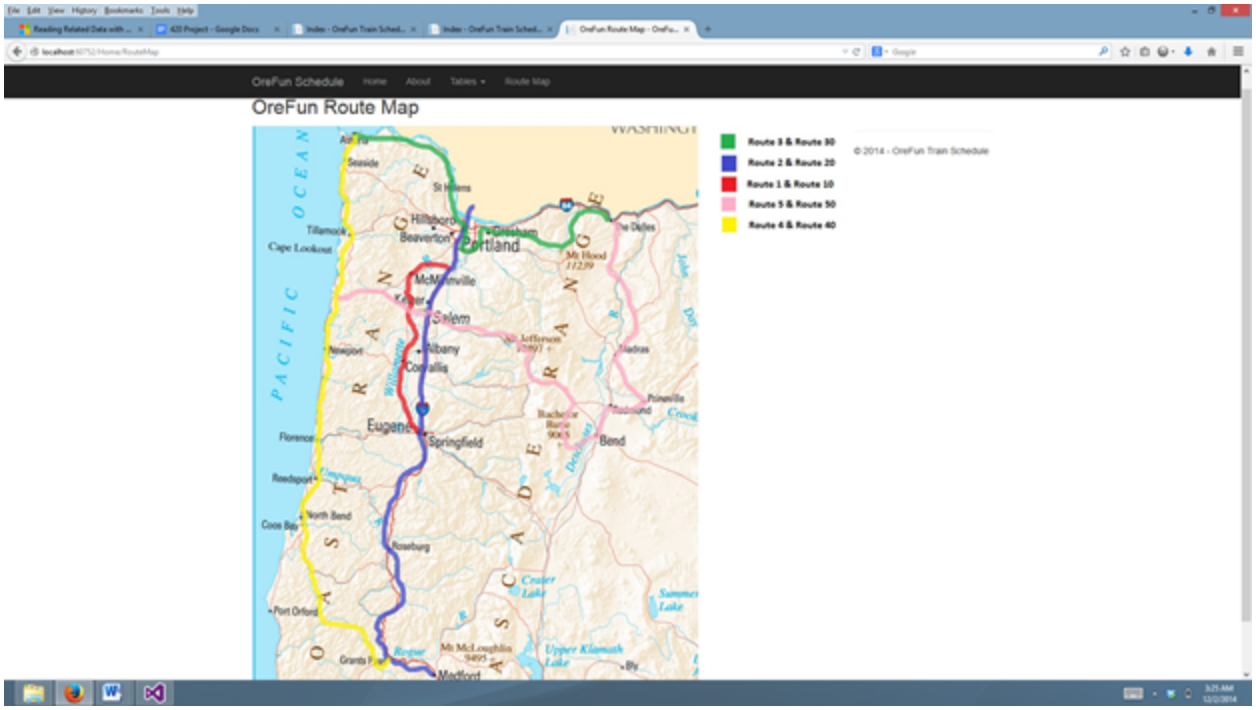


Route_Station
Primary Key - RouteID
Canidate Key - StationID
Highest NF -

RouteID	StationID

Screen Shots of System GUI:




OreFun Schedule
Home
About
Tables
Route Map
OreFun Route Map
Route 3 & Route 30
Route 2 & Route 20
Route 1 & Route 10
Route 5 & Route 50
Route 4 & Route 40
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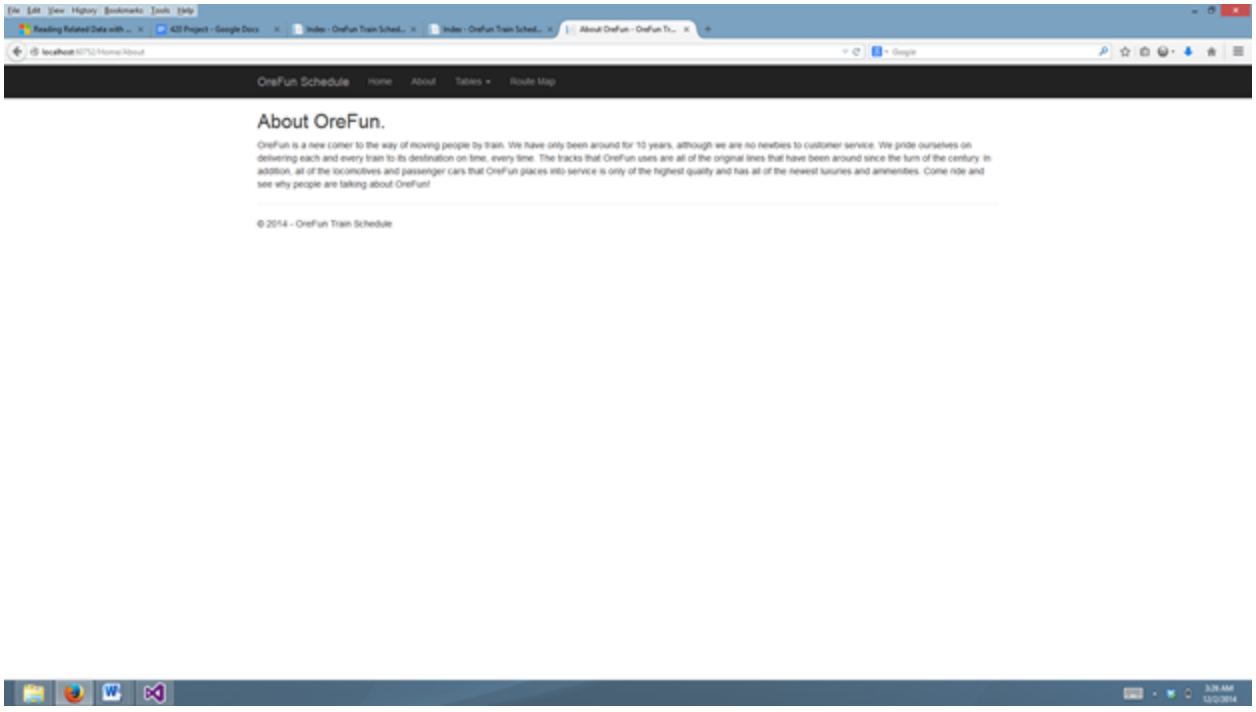
PACIFIC OCEAN
Portland
Salem
Eugene
Springfield
Bend
Medford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About OreFun.
OreFun is a new comer to the way of moving people by train. We have only been around for 10 years, although we are no newbies to customer service. We pride ourselves on delivering each and every train to its destination on time, every time. The tracks that OreFun uses are all of the original lines that have been around since the turn of the century. In addition, all of the locomotives and passenger cars that OreFun places into service is only of the highest quality and has all of the newest luxuries and ammenities. Come ride and see why people are talking about OreFun!
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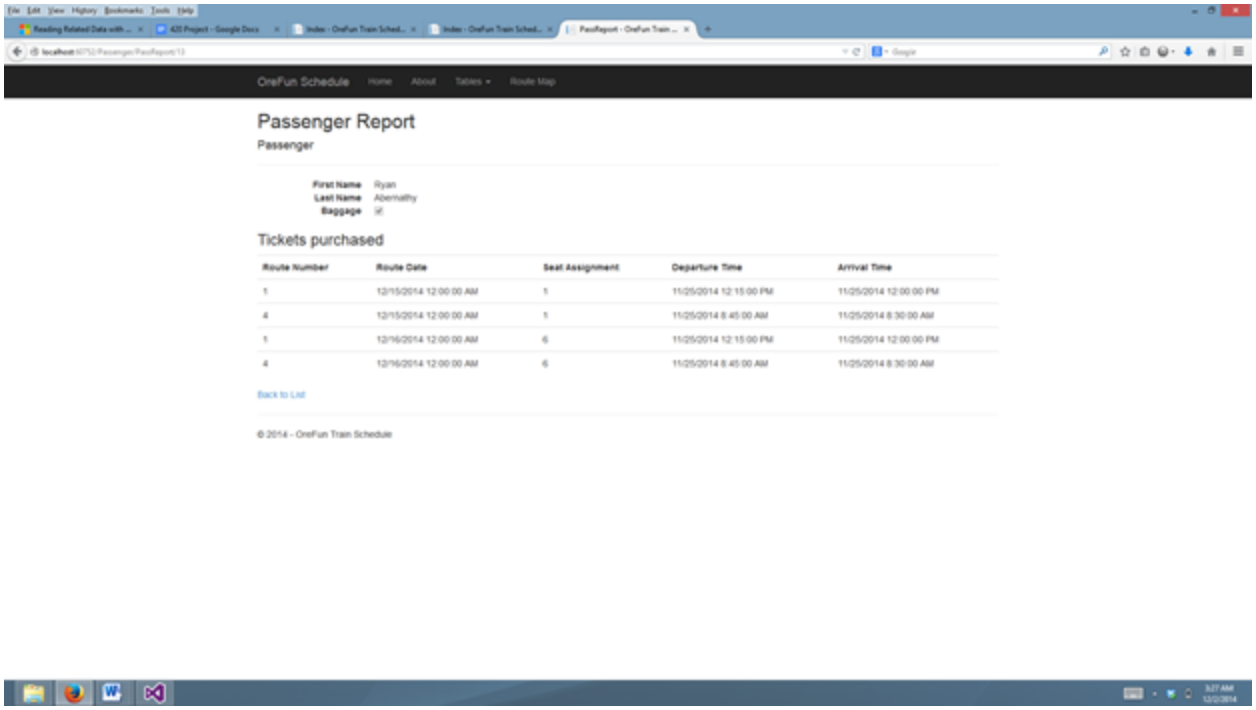
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Passenger Report
Passenger
First Name Ryan
Last Name Abernathy
Baggage
Tickets purchased
Route Number
Route Date
Seat Assignment
Departure Time
Arrival Time
1 12/15/2014 12:00:00 AM 1 11/25/2014 12:15:00 PM 11/25/2014 12:00:00 PM
4 12/15/2014 12:00:00 AM 1 11/25/2014 8:45:00 AM 11/25/2014 8:30:00 AM
1 12/16/2014 12:00:00 AM 6 11/25/2014 12:15:00 PM 11/25/2014 12:00:00 PM
4 12/16/2014 12:00:00 AM 6 11/25/2014 8:45:00 AM 11/25/2014 8:30:00 AM
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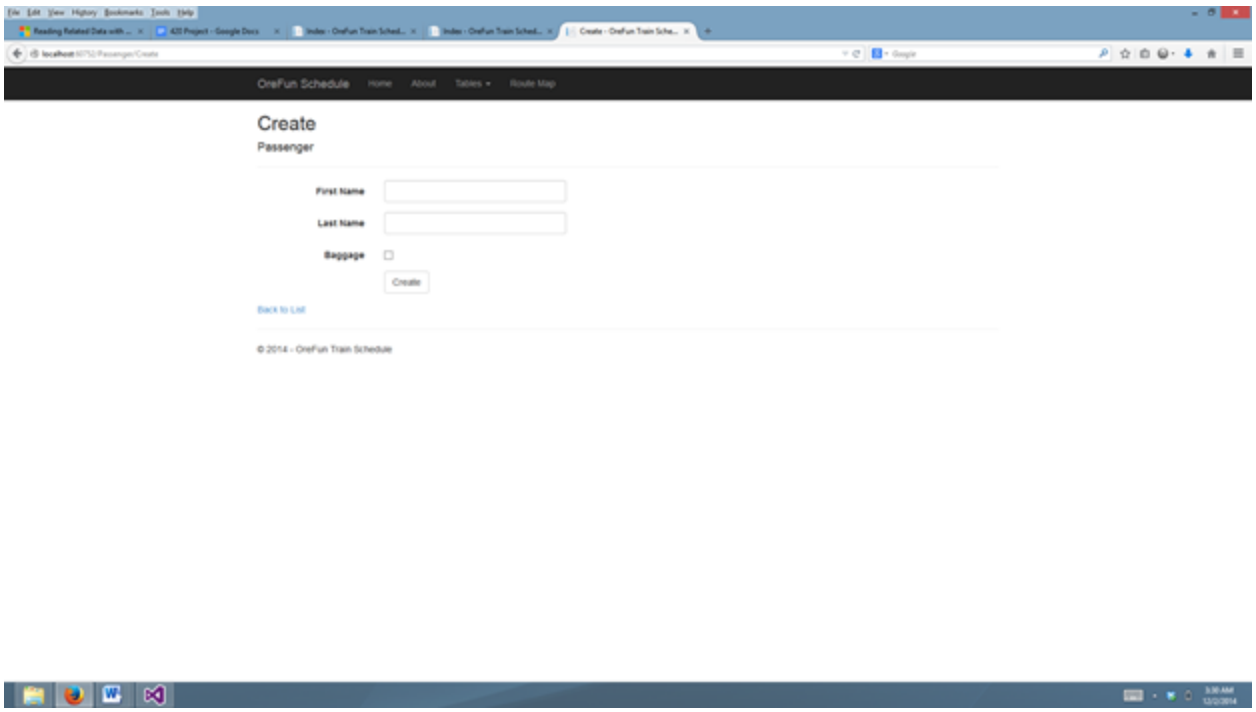
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Baggage
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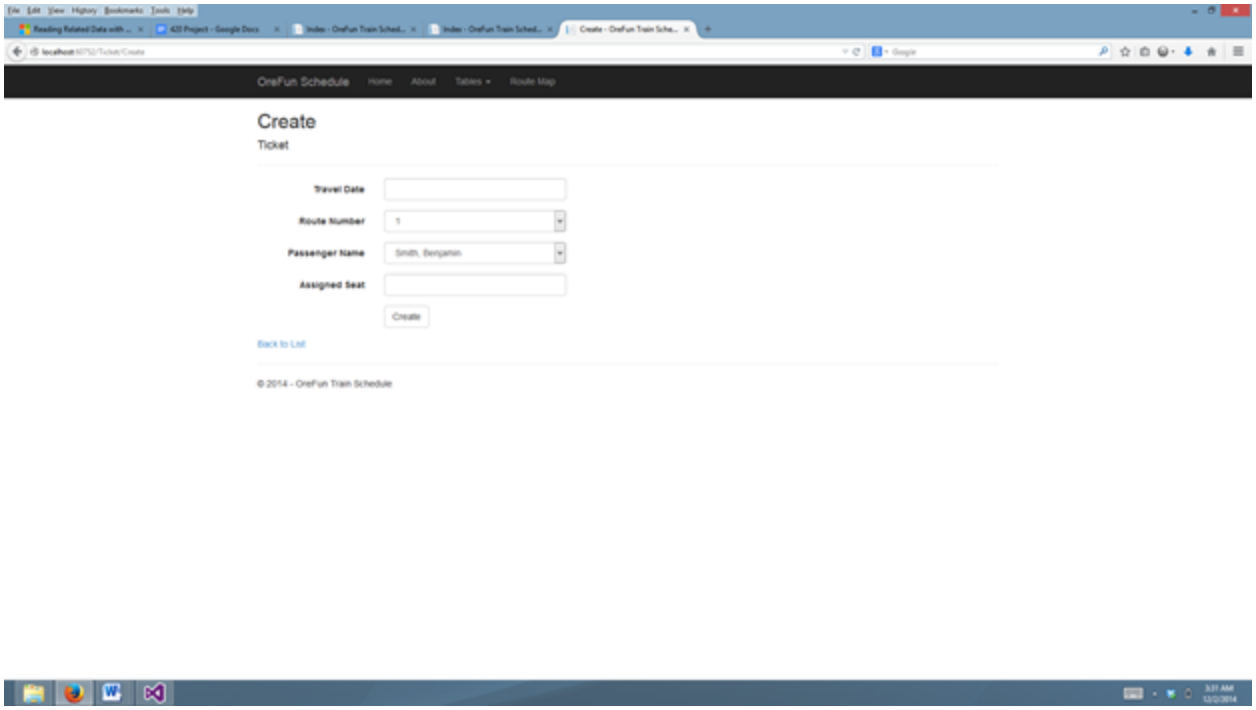
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Create
Ticket
Travel Date
Route Number
1
Passenger Name
Smith, Benjamin
Assigned Seat
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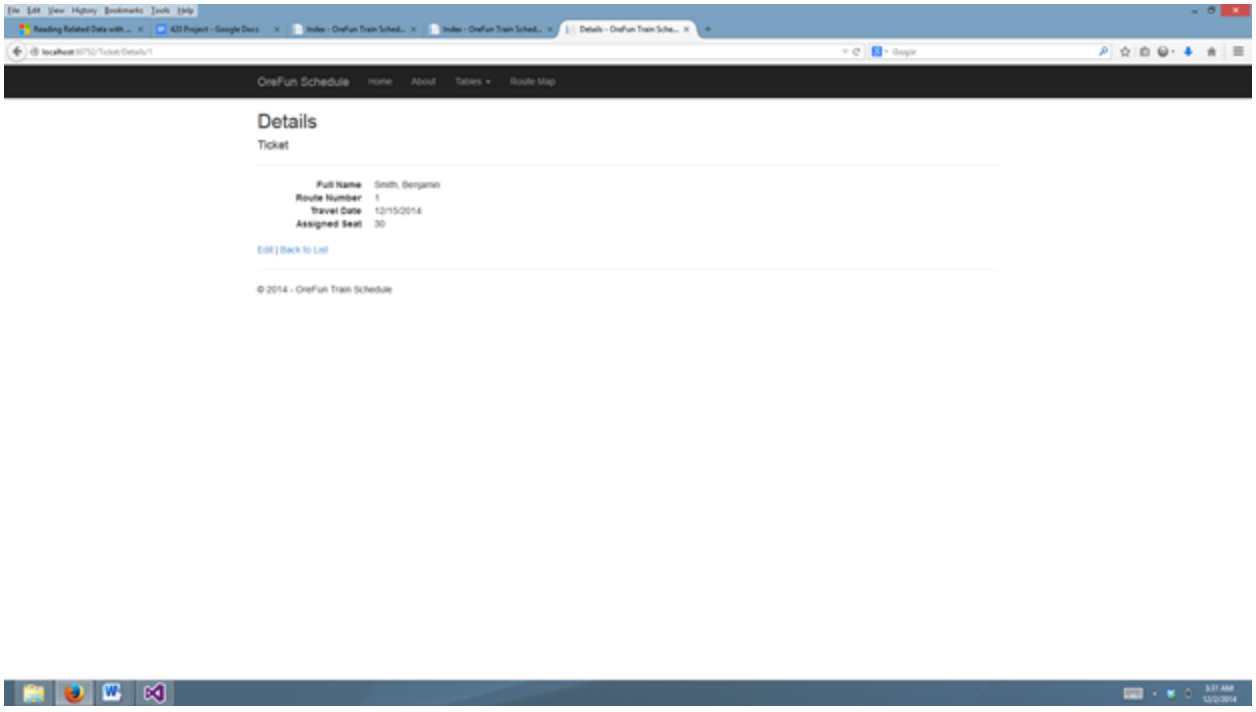
OneFun Schedule
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Route Map
Details
Ticket
Full Name
Smith, Benjamin
Route Number
1
Travel Date
12/15/2014
Assigned Seat
30
Edit | Back to List
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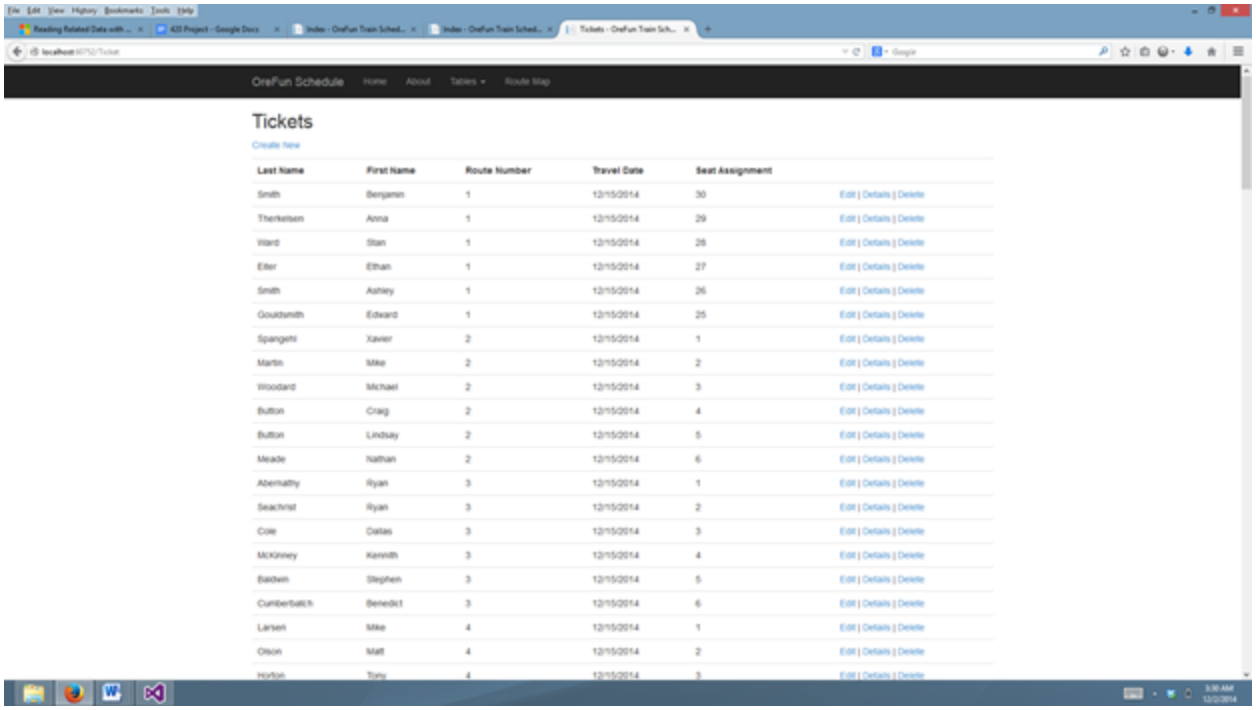
OreFun Schedule
Home
About
Tables
Route Map
Tickets
Create New
Last Name
First Name
Route Number
Travel Date
Seat Assignment
Smith Benjamin 1 12/15/2014 30 Edit | Details | Delete
Therkelsen Anna 1 12/15/2014 29 Edit | Details | Delete
Ward Stan 1 12/15/2014 28 Edit | Details | Delete
Eller Ethan 1 12/15/2014 27 Edit | Details | Delete
Smith Ashley 1 12/15/2014 26 Edit | Details | Delete
Gouldsmith Edward 1 12/15/2014 25 Edit | Details | Delete
Spangehl Xavier 2 12/15/2014 1 Edit | Details | Delete
Martin Mike 2 12/15/2014 2 Edit | Details | Delete
Woodard Michael 2 12/15/2014 3 Edit | Details | Delete
Button Craig 2 12/15/2014 4 Edit | Details | Delete
Button Lindsay 2 12/15/2014 5 Edit | Details | Delete
Meade Nathan 2 12/15/2014 6 Edit | Details | Delete
Abernathy Ryan 3 12/15/2014 1 Edit | Details | Delete
Seachrist Ryan 3 12/15/2014 2 Edit | Details | Delete
Cole Dallas 3 12/15/2014 3 Edit | Details | Delete
McKinney Kennith 3 12/15/2014 4 Edit | Details | Delete
Baldwin Stephen 3 12/15/2014 5 Edit | Details | Delete
Cumberbatch Benedict 3 12/15/2014 6 Edit | Details | Delete
Larsen Mike 4 12/15/2014 1 Edit | Details | Delete
Olson Matt 4 12/15/2014 2 Edit | Details | Delete
Horton Tony 4 12/15/2014 3 Edit | Details | Delete