# Freight Train Simulator Game

Team: The Hip Replacements

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The iteration 2 project submission is comprised of the following documents:

- Iteration 2 Cover.pdf – Project overview (this document), methodology to create test data, and description of game algorithm.
- Test Layout Map.pdf – A topographical drawing illustrating modules, main lines, junctions, and industries (supplemental to this document).
- Entity Relationship Diagram.pdf – Groups of entities, their relationships, cardinality, and notes.
- Relationship Model Diagram.pdf – Tables and relational constraints.
- TrainGame.sql – MySQL tables for all game framework, notes, pre-conditions, and assumptions.
- TrainGame_Data.sql – MySQL insertions for static test data, notes, and instructions.
- DemoApp.zip – Proof of concept console application showing database interaction.

While the entity relationship diagram contains notes and the relationship model diagram has a clear list of all relations, attributes, primary keys, foreign keys (and their associated constraints), non-referential constraints and assumptions reside as comments in the TrainGame.sql file.

The package that the Freight Train Simulator game is being built with is MySQL and is being tested on MySQL 5.6.27. The contents of TrainGame.sql, then TrainGame_Data.sql have been imported to that server, in that order.

The static test data in TrainGame_Data.sql is modeled after a collection of actual model railroad modules, depicted in the Test Layout Map.pdf document. For the purpose of simulating gameplay, a small layout is constructed. The purpose of the test data is to construct several modules, identify properties of industries on those modules, and allow players to build trains and deliver products via railcar to those industries. Please see the TrainGame_Data.sql file comments for additional details.

For version 1.0 (this release), the algorithm for shipping orders is as follows:

For every industry, industries have product types that are produced or consumed. Each product type is associated with a specific type of rail car. Shipping orders are generated to pick up a “produced” product at one industry and deliver to another “consumed” industry. Every “produced” industry interacts with every other matching “consumed” industry by product type, except itself. Shipping orders only exist for types of rail cars in use for the current game session.

Additionally, 12 rail cars for three players have been created to test the gameplay mechanic. For each player, a train is assigned. For each train, rail cars are added. For each rail car, a shipment order is created, assigned to a train via a waybill, and the car is added to the train. Finally, players are assigned to trains as crew. From this test data, players will be able to deliver rail cars to industries on the layout.