

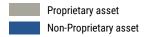
It's your time... to design

Assignment: full-truck load orders optimization (1)

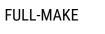
WHAT IS A FULL TRUCK LOAD?

Full truck load (FTL) carriers typically haul loads for one single shipper. In these cases, the shipper "rents" a trailer to transport their product where it needs to go, typically paying a "per mile" or "per "trip" (one-off) from the carrier^[1].

FULL TRUCK LOAD PRODUCTION MODES











ARCESE IN NUMBERS

- +240 proprietary trucks
- +2500 proprietary semi-trailers
- +130 dedicated fleet trucks
- +285 traction hauliers
- +700 LTL & FTL trucks
- +2500 brokerage hauliers
- +15 intermodal players



^[1] https://en.wikipedia.org/wiki/Less-than-truckload_shipping

Assignment: full-truck load orders optimization (2)

SAMPLE FTL ORDER



ROUTE: ITALY_NORTH_WEST__GERMANY_RUHR







Assignment: full-truck load orders optimization (3)

HOW THE PLANNING PROCESS WORKS?

- The PLANNER allocates (plans) on week A, the necessary capacity (assets and suppliers) for week B, according to:
 - o Geography, meaning "from-to" location of the transport orders, split per **route** as per provided dataset
 - Expected volumes (forecast)
- The best scenario is the one that minimizes both costs and time to issue the transport (HINT: use €/km and penalties related to proprietary asset unused)

PROVIDED DATASET

- 98 routes built as "FROM_AREA" + underscore underscore + "TO AREA", e.g., "BELGIUM__ITALY_NORTH_EAST_CENTER"
- 772574 actual transport orders in one year, split per route and day



Assignment: full-truck load orders optimization (4)

1st QUESTION [max 2 slide]

Explain why an order forecasting system is a good idea for a transportation company

2nd QUESTION [max 4 slide]

- Create a forecasting algorithm that predicts next week expected orders per route. Measure its performances.
 HINTS:
 - o Search for "timeseries" on Google to see how similar problems are treated
 - o split the dataset samples for training (60%), validation (20%), and testing (20%). Use your training set to train your algorithm, test set to see results, and validation set to reduce overfitting

3rd QUESTION [max 3 slide]

- Create an optimization algorithm that minimizes the costs considering the following input:
 - PRODUCTION COSTS

Full-make costs = 2.00 €/Km
 Mix costs = 1.90 €/Km
 Full-buy costs = 1.50 €/Km

Cost of no proprietary truck usage = 250€/day

Costs of no proprietary trailer usage = 500€/day

ASSET AVAILABILITY

Full-make = 200 trucks+trailers

Mix = 2000 trailersFull-buv = no limits

HINTS:

- · optimize first all proprietary assets
- use a sample time-frame to simulate



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