# Analytics test 2020-10-27

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## 1. Entity modeling

Model the required entities and relationships for an advanced traffic control system that routes cargo around the country.
Consider:

- different terrestrial vehicles
- road characteristics and their height and cargo restrictions
- available reports about the state of the roads

## 2. Data modeling

Design the data schema for a social network for amateur photographers with the following characteristics:

- authentication and (simple) user profile management
- share pictures
- label the pictures with tags (ex: car, bird, landscape, …)
- comment on the pictures
- rate the pictures

## 3. Data analysis

Given a dataset (see attachment dataset_real_estate.csv) analyze the data and provide insights. You can perform statistical analysis and/or machine learning methods.
What insights can you get from the dataset with respect to these aspects:

- the properties
- the market
- the quality of the data
- and any other suggestions

# 4. Requirements

The EAFIT university wants to change the system that controls the access and payment for the parking lot. In order to analyze and design the new system you need to propose the initial requirements. Keep in mind that the university already has a system to manage the users.

# 5. Challenge

The game “Pro Evolution Soccer” has a master league mode where you can select the starter and bench players for each game. There are some important factors to consider when selecting the players:

- each player can play in one or more positions (ex: central defender, full-back, or central midfielder)
- the abilities of each player for each position are measured from 0 to 99, and a player can have different values for each position he can play in
- there are different formations for the team (ex: 4-4-2, 4-3-3, or 3-4-1-2)
- the players have a physical condition ranging from 0 to 99 that changes for each game
- a player can be unavailable because of injury

Given that the physical condition of a player can change, and the players get injured, it is required to make an evaluation before each game and define which formation to use, what are the starting players and in which positions they play. Propose an algorithm that provides a solution or an approximation to the problem so that you can have the best possible team for each game.