**Supplier Audit Results Prediction**

Data Science Internship Case Study

* Welcome

Hello everyone, my name is Juan Betancourt and I’m a master’s student applying for a data science internship position. In this presentation I will share my approach and results to the proposed task of predicting the audit results for suppliers.

* Contents

These are the contents covered in this presentation. Let me begin with a brief introduction to the problem.

Introduction (3 mins)

* Motivation

Managing suppliers is a critical aspect of the operational efficiency of any manufacturing company. Issues such as irregular lead times, backlogs, and incorrect orders can significantly disrupt manufacturing schedules, increase costs, and ultimately impact the service level provided to customers.

In the proposed context, we are interested in the supplier audit processes which are used to ensure reliability of suppliers. Selected suppliers must go through the audit process before they are fully entrusted to deliver parts for BMW production processes.

* Context

Under this motivation, let’s define the problem. BMW has a set of suppliers that provide a set of derivatives for the production process. However, every supplier works with a subset of derivatives.

Each supplier is audited for the derivatives it provides. If we consider a particular supplier and a particular derivative, the audit process consists of three sequential stages: T1, T2 and T3.

For each stage, supplier receive a color-coded qualification: green for qualified status, yellow for received a waring, and red for disqualified. The audit result will then be the qualification of the latest audit stage.

For a better understanding of this dynamic, let’s consider an example in which this supplier is audited for the red derivative. On the first time step, the supplier might have recievid a green qualification on the first stage T1. Then, the result of the audit at that time step would be green. On the next time step, the supplier is added to T2 and received a red qualification. Then, the audit result would be red as T2 is the latest active stage. In the next time step, the supplier receives a yellow qualification for T2, so the audit result changes to yellow. In the two last stages, the supplier is added to T3 and the audit result will be precisely the qualification of this stage as it is the latest audit stage. We are then interested in predicting audit result, to forsee if there will be enough qualified suppliers in the future.

Data Exploration (3,5 mins)

Data Preprocessing and Feature Engineering (3,5 mins)

Model Selection and Prediction (3 mins)

Business Recommendations (2 mins)

Model Maintenance (2 mins)

Further Development (2 mins)