Project Number: 70

Project Title: Vehicle Parts Recommender

Project Clients: Kim Horn

Project specializations: Software Development;Web Application Development;Artificial Intelligence (Machine/Deep Learning, NLP);Computer Science and Algorithms;Big data Analytics and Visualization;

Number of groups: 3 groups

Main contact: Kim Horn

Background:

The aim of this project is to build a product recommender, using past data. Market basket analysis is one of the most used types of Machine Learning in the business space. Infomedia is a global Parts Data company: infomedia.com.au. Infomedia deals with Automotive manufacturers and Vehicle dealerships and processes their data. One of Infomedia's main products is a B2B and B2C SaaS Vehicle Part ordering system used by many auto dealerships. The goal is to add Market Basket analysis to the product.

Requirements and Scope:

From a history of Vehicle Parts Orders build a market basket model that can recommend 'relevant associated' product (part) items when a customer is adding single part items to their order basket. The data provided will include a large set of vehicle parts orders, and a graph of how these parts are related.   The delivered system will be in two parts:

1. It will input a file of parts data, process the data, and a machine learning system will produce a recommender model. The model may be augmented with domain rules. Provide a viewer for Product users to see and edit the model rules.

2. The model will be input to a front end GUI Assistant System, that takes in user part items (by ID), in a basket, and generates recommendations. This may be two modules, a front web GUI, and a backend REST API.

Required Knowledge and skills:

Explore and understand market basket technical approaches available today, e.g. Apriori, Eclat, FPGrowth, and document pros and cons. Choose the best approach and use the data to build a model. Provide a way for domain experts, mechanics and Parts staff, to view and understand the rules (model) generated. Explore and research how to represent the rules explicitly in, for example a graph, and then how to mix in background and domain knowledge, that provides a deeper meaning for 'associated' parts. Parts may be connected physically, replaced together etc. Make part orders goal oriented rather than simply a list.

For example, a Dealership needs to fix a customer's problem, and the order can be optimised for this repair by ordering more parts to solve common issues, but knowing they all may not be required. Having more parts means the time to fix is reduced. This kind of 'information' could be added to the graph. Provide a user interface so the Infomedia Product team can view, edit and understand the rules generated. Provide a user interface so customers can order items and get recommendation for other parts interactively. More detailed use cases will be provided in the project, and a more definitive spec.

Expected outcomes/deliverables:

The outcome is two modules, a model generator and the assistant front end. Infomedia will provide all background information, expert knowledge, in both the domain and can also in Market basket ML approaches, Mechanical domain and background knowledge, and rules, about parts will be provided, with demonstrations of the parts ordering system.