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# Problem Statement

The Numpy Supermarket chain, with locations in Windhoek and across Namibia, faces difficulties in leveraging its extensive customer transaction data for informed decision-making. Despite the availability of valuable data, a lack of effective data analysis is preventing the supermarket from optimizing service delivery, product offerings, and customer satisfaction. By applying data analytics techniques—such as data cleaning, preprocessing, and predictive modeling—the supermarket seeks to uncover actionable insights into customer behavior. This will enhance operational efficiency, boost customer loyalty, and improve overall business performance.

# Initial Data Set

The initial data set comprised of 16 columns made up of various data types. The table below provides the details of the columns as well as the descriptions of their respective data types.

**Table 1.**



# Data cleansing

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# data analysis

# Machine learning

# conclusion