**Assignment 1**

**Uzair Nadeem – 24928**

**Selected Dataset:**

The dataset selected is the Barcelona accidents dataset, which has information about injuries, number of vehicles involved, time, and locations of accidents in Barcelona in 2017.

**Facts:**

* Mild Injuries
* Serious Injuries
* Victims
* Vehicles Involved

**Dimensions:**

* District Name
* Neighbourhood Name
* Street
* Weekday
* Month
* Day
* Hour
* Part of the Day

**Useless Variables:**

* Id
* Longitude
* Latitude

**Identified Problems:**

1. **Areas With a High Number of Vehicles Involved**

Areas with a high total number of vehicles involved will be analysed across several factors such as weekdays, part of the day, hours, etc.

**Process Diagram:**

**Charts:**

The district with the highest total number of vehicles involved in accidents is Eixample.

Within Eixample, the neighbourhood with the highest total number of vehicles involved is la Dreta de l'Eixample

In la Dreta de l'Eixample, the streer with the highest total number of vehicles involved is Corts Catalanes.

On Corts Catalanes, afternoon is the part of the day which saw the highest total number of vehicles involved in accidents.

In la Dreta de l'Eixample, afternoons have the highest total number of vehicles involved.

On Corts Catalanes, Tuesdays have the highest total number of vehicles involved in accidents.

In Corts Catalanes on Tuesdays, afternoons have the highest total number of vehicles involved in accidents.

**Insights and Recommendations:**

The data suggests that the Eixample district has the highest total number of vehicles involved in accidents, and that most of these accidents happen in the la Dreta de l'Eixample neighbourhood. Within the neighbourhood, the highest total number of vehicles involved is in the afternoons. The street with the highest number of vehicles involved is Corts Catalanes, and on Corts Catalanes, the afternoon hours, similar to the rest of the neighborhood, have the highest total number of vehicles involved.

Further research suggests that the Eixample district is a very densely populated district of Barcelona, and that the la Dreta de l'Eixample neighbourhood experiences experiences a high volume of traffic (this is also consistent with the data provided) due to being a commercial hub, leading to a high number of delivery vehicles that can obstruct traffic and be a safety risk.

In order to address the problem of high traffic volume in the la Dreta de l'Eixample neighbourhood, measures to improve traffic management should be taken. More traffic signals should be installed throughout the neighbourhood, and traffic police should be deployed in peak traffic hours on specific areas of the neighbourhood. Specifically, during the afternoons on Corts Catalnes, deploying traffic police would help alleviate traffic congestion and lead to a lower number of vehicle involvements.

1. **Analysis of Average Number of Victims Involved in Accidents**

Areas with a high average number of victims involved will be analysed across multiple factors, such as weekday, part of the day, hour, etc.

**Process Diagram:**

**Charts:**

**Note:** All charts below ignore the data entries with the value of “Uknown” in the District Name column.

The Sant MartÃ­ district has the highest average victims involved in accidents.

In Sant MartÃ­, the neighbourhood with the highest average number of victims involved is el BesÃ²s i el Maresme.

In the el BesÃ²s i el Maresme neighbourhood, Tuesdays have the most victims involved on average.

In the el BesÃ²s i el Maresme neighbourhood on Tuesdays, most victims are involved in accidents during the night on average.

In the el BesÃ²s i el Maresme neighbourhood on Tuesday Nights, hour 0 has all of the victims involved.

**Insights and Recommendations:**

The data suggests that the Sant MartÃ­ district has the highest average number of victims involved in accidents. Within the district, the el BesÃ²s i el Maresme has the highest average number of victims. On average, most of the victims are involved in accidents on Tuesday, and on Tuesdays, most victims are involved in accidents occurring during the night (on average). All of these victims were part of accidents during hour 0 on Tuesday nights.

Further research suggests that the high average number of victims on Tuesdays could possibly be due to a higher number of people commuting to work on Tuesdays and Thursdays, as people work remotely on other days. Accidents also tend to rise during later hours of the day due to factors such as driver fatigue and impaired driving.

In order to reduce the average number of people involved in accidents in the Sant MartÃ­ district, and specifically in the el BesÃ²s i el Maresme neighbourhood, road safety awareness campaigns could be launched for both drivers and pedestrians residing in the neighbourhood. This will allow people to take measures to make roads safer, as well as increase awareness among residents about the importance of road safety.

**Resources Used:**

ChatGPT was used to research specific information related to traffic dynamics in Barcelona, which was used to understand why certain trends in the data appear, and recommend feasible solutions to the business problems described.