**Teleprompter Script of my Presentation**

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I have worked on the project very close to my heart. I have worked on the impact of inefficient parking in cities today. With the increase economic trends and spending power of people in today’s world. We see there is a huge increase in the number of motor vehicles and cars has increased in the streets exponentially. While this is symbol of development where the people are getting richer. But every success comes at a price. The price here the traffic congestion and above all air pollution. I being a fan of Leonardo Dicaprico I got inspired by the movie The Revenant and preferred to work on the concept to understand the impact of ineffective parking on the environment.

I worked on the parking data set which was the real time information of the Aarhus city in Denmark which is a smart city. Given the data set the parking has no enough data to understand the impact of the data set and help us understand the impact of the traffic on the environment. So I merged the parking data with the pollution data set. The parking data set has the information has the data points 1. Vehicle Count 2. Total Space 3.GarageCode and the pollution data set had the following data points 1. Ozone 2.Sulpur Dioxide 3. Particulate matter 4.Nitrogen Dioxide and Carbon Monoxide. The details of the data set are as follow. We look at the each data field in the detail below:

1. **Vehicle Count**: This gives the number of vehicles which can be parked in the garage in a streets of Aarhus city in Denmark.
2. **Total Spaces**: This gives the number of the spaces available for parking in a garage in the Aarhus city of Denmark.
3. **Garage Code**: This is the unique identification code for the garage where the vehicles are parked.

Pollution Data Set

The pollution dataset has the following data points for analysis. They are

1. **Ozone**: Ozone as stated above is one of the important components of the atmosphere. The ozone layer forms a protective blanket around the surface of the earth. This protective layer helps in cool down and avoid the ultraviolent rays from reaching the earth atmosphere. With increase in the pollutants will decrease the ozone content in the atmosphere will lead to a phenomenon called global warming.
2. **Sulphur Dioxide**: Sulphur Dioxide is a major air pollutant which is released in the atmosphere by the industries. This also releases when the coal is burnt.
3. **Carbon Monoxide**: Carbon Monoxide is mostly released by the motor vehicles. The Carbon Monoxide when released in the atmosphere will impact the ozone layer.
4. **Particulate Matter**: Particulate Matter is the sum of all solid and liquid particles suspended in the air many of which are hazardous. This complex mixture for instance dust, pattern, smoke and liquid droplets.
5. **Nitrogen Oxide**: Nitrogen oxide are a family of poisonous, highly reactive gases. These are released in the atmosphere when fuel is burnt at high temperature.
6. **Longitude**: The longitude is the geographic coordinate that gives east and west position point on the earth’s surface. This along with the latitude will give the exact position of the place we intend to go.
7. **Latitude**: The latitude is the geographic co-ordinate gives the North and South position point on the earth’s surface. This helps us gets to the accurate position where we want to go.

Based on the data sets I had, I decided to merge the ozone layer content with the parking data set. I chose the ozone layer as that’s the main component that impact the atmosphere the most. The ozone layer is a component of oxygen which surrounds the atmosphere of the earth. This layer will form a blanket around the earth which will stop the ultraviolent rays from affecting the earth surface. The depletion of ozone layer will cause the temperature rise on the surface on the earth. The increased temperature will lead the meltdown of the glaciers, increase in the ocean and river water level which will lead the other phenomenon like floods, tsunami etc. The phenomenon of the depletion of the ozone layer is called greenhouse effect.

Not that the other factors in the pollution data set are not important. We chose the ozone content in the atmosphere for all the above mentioned parameters. We studied the state of art in parking management in various cities. The present parking systems are 1. Vision Method 2. Sensor Method and 3. Manual method. The state of art systems are 1. Blind search parking 2.Parking Information System and 3. Buffered Parking Information system. We discuss this each of these methods in detail below.

1. **Blind Search Method**: Blind search method is a simple strategy applied for the users when there is no parking information. In this case the driver keeps driving till they find the parking within the certain distance to their destination. The drivers will not stop searching until they find a place. If the driver doesn’t find a space he will extend the search and continuously look for the parking near the place where he wants to go. This process has many drawbacks. This will can create a lot of traffic congestion in any location during busy hours.
2. **Parking Information System:** This is the mechanism is commonly adopted by the current state of the smart parking design. This system will publish the number of vacant spaces in the parking centers nearby. The driver will be able to decide their desired parking destination where the parking lot has available space accordingly to their need and the area where they are comfortable. However if the number of vacant spaces in a parking lot is very limited in busy hours. This will lead to a phenomenon called multiple car chasing single space. This will cause severe traffic congestion. As per the census it is stated that seventy percent of the traffic on the streets is because of the search for parking. This will increase the carbon monoxide in the atmosphere and increase the pollution. The increase in carbon monoxide will lead to the decrease in the ozone content in the atmosphere which will lead to the phenomenon called global warming. This has been common problem around the world. This will lead to the same problem as the blind search that the drivers will be driving around till they find a parking spots. This system too has many drawbacks. For example fake parking requests, driver identification and also lack of planning during busy hours will lead to the same problems as mentioned previously.
3. **Buffer Parking Information System:** The Buffer Parking Information Systems was an advanced version of the parking information system. The functioning of this is similar to the parking information system. The main difference between the two systems is that the system will ensure that system doesn’t release all the vacant parking spaces during the busy hours. These spots are called the buffer spots. The system will release the only a limited amount the vacant spaces during busy hours. Once all the available spots are filled the system will release the remaining the vacant spots for the drivers for parking. This system ensured to a certain extent that the lack of planning during busy hours is solved to a certain extent. But the fake parking request still exists and further the how long will the parking slot be available for the driver is not addressed.
4. **Smart Parking System based on Reservation:** This is the system we have the used to improve and add an additional leg to understand the pollution content in the atmosphere and then tally the same with the location and help the administration build a better infrastructure and measures to contain the pollution. The system work similar to the Parking Information System. The Smart Parking Information system has a database which has the connection to the phone through an application. The driver driving the area can log in to the application through its smart phone. The application will give the number of vacant spots near the areas where the driver is looking the vacant spots. Once the driver decides where he wants to park his vehicle he will be able to request for the spot using the application on his phone for his reservation of that parking spot. Once the reservation is confirmed the system will send a quick response code or QR code to the driver using the Short Message Services (SMS) when entered will reserve the parking spot for the driver. Once the reservation is confirmed the driver will get a message with the spot id on his phone which will help him park his/her vehicle. This system was an advanced version of the parking information system and the Buffer Based Parking Information System. The advantage of this system this will considerably reduce the fake parking request, driver identification and delay in reaching the parking spot. The reservation of the parking slot is valid for thirty minutes from the time the slot is reserved, post which the slot will be released for the next driver to use it.

We used the Smart Parking Based on Reservation system as the basis of our analysis. We used multiple linear regression and time series for our analysis. We used multiple linear regression to fit a predictive model. . The Linear Regression is an approach for modelling to establish a relationship between a scalar dependent variable and one or more explanatory variable. The dependent variable is usually represented as by Y and the explanatory variable are usually denoted by X. In a linear regression explains the relationship between linear predictor function where the unknown estimated parameters. We used time series to perform our analysis. A time series is a sequence taken at a successive equally spaced points in a time period. The time series analysis compares methods for analyzing time series data in order to extract the meaningful statistics and other characteristics of the data. Time series forecasting is used to predict future values based on the historical values based on the historical data.

* The results gives us an idea the about how we can predict the data and use the data to perform the time series analysis. The summary of the results are Our results focused on identification of the parameters which impacted the ozone layer on the parameters.
* Our linear regression model help us understand the relationship between the independent and dependent variables.
* The time series helped us understand the impact of each of our variables on the ozone later.

And finally I conclusion I would like to say the following:

In this paper we have tried to study the impact of the inefficient parking arrangements on the environment. As mentioned previously seventy percent of the air pollution is caused by the search for parking in a city. The carbon monoxide generated will reduce the content of the ozone layer in atmosphere. The decrease in the ozone layer we will lead to the phenomenon called global warming. Hence we chose the ozone content as our dependent variable. From the results we can conclude that the vehicle counts and total spaces available in the garage impact the ozone layer in the atmosphere.

The time series gave us a sixty percent accurate results to predict the areas where the pollution is high. These analysis will be effective in building a smarter city. The department which can benefit from these analysis are 1. Transport department 2. Traffic control department and 3.Infrastructure. The transport department can use these analysis for plan their public transport facilities and their timings which can help reduce the traffic congestion and the also help in reducing the pollution in the environment. The traffic control department can study the pattern of the traffic congestion in an area and also ensure we they can have a proper workforce management in areas where the traffic congestion is reported to be high. And finally the city administration can understand the traffic and parking behavior can help in building proper infrastructure and also regulate the parking prices in the areas where there is a demand in parking during busy hours.

These analysis can be used to build to smart cities. Smart cities are things for the future. Many countries are looking to build smart cities to ensure they can provide a properly connected and transparent administration which can work for the welfare of its citizens.