# DAD 220 Analysis and Summary Template

Replace the bracketed text in this template with your responses and any supporting screenshots. Then submit it to the Module Five Activity for grading and feedback. Rename this document by adding your last name to the file name before you submit.

1. **Analyze the data** you’ve been provided with to **identify themes**:
   1. Which parts are being replaced most?
      1. According to the data in the table the part that is being replaced the most is the Fule Tank with a total of 95.

A screenshot of a computer

Description automatically generated

SELECT Repair AS PART\_REPAIR, COUNT(\*) AS NUMBER\_OF\_REPAIRS

FROM PartsMaintenance

GROUP BY PART\_REPAIR

ORDER BY NUMBER\_OF\_REPAIRS DESC;

* 1. Is there a region of the country that experiences more part failures and replacements than others?
     1. Identify region:
        1. According to the data in the table the region that experiences the most repairs total is the MidWest with a total of 260 repairs.



SELECT "SOUTHWEST" AS REGION, COUNT(\*) AS NUMBER\_OF\_REPAIRS

FROM PartsMaintenance

WHERE UPPER(state) IN ('AZ','NM','TX','OK')

UNION

SELECT "SOUTHEAST" AS REGION, COUNT(\*) AS NUMBER\_OF\_REPAIRS

FROM PartsMaintenance

WHERE UPPER(state) IN ('AR','LA','MS','AL','GA','FL','KY','TN','SC','NC','VA','WV','DE','MD')

UNION

SELECT "NORTHEAST" AS REGION, COUNT(\*) AS NUMBER\_OF\_REPAIRS

FROM PartsMaintenance

WHERE UPPER(state) IN ('PA','NJ','NY','CT','RI','MA','VT','NH','ME')

UNION

SELECT "MIDWEST" AS REGION, COUNT(\*) AS NUMBER\_OF\_REPAIRS

FROM PartsMaintenance

WHERE UPPER(state) IN ('ND','SD','KS','NE','MN','WI','IA','MO','MI','IN','IL','OH')

UNION

SELECT "WEST" AS REGION, COUNT(\*) AS NUMBER\_OF\_REPAIRS

FROM PartsMaintenance

WHERE UPPER(state) IN ('WA','ID','MT','OR','WY','CO','UT','NV','CA')

ORDER BY NUMBER\_OF\_REPAIRS DESC;

* + 1. How might the fleet maintenance team use the information to update its maintenance schedule?

The fleet maintenance team can use the data to update its maintenance schedule in various ways. Firstly, because the Midwest region has the highest number of repairs, the team should allocate more resources, technicians, and spare parts to this region. This way, they can ensure repairs are done promptly, reducing downtime for vehicles. Secondly, the team can schedule more frequent inspections and preventive maintenance in regions with higher repair counts. This will help them identify potential issues early and prevent major breakdowns from happening. Thirdly, armed with this information, the team can manage their parts inventory more effectively. They can keep more spare parts in the regions with higher repair counts, reducing the waiting time for part replacements. Fourthly, the maintenance team can analyze why certain regions have more repairs. Different driving conditions, climate, or road conditions might be the cause. Understanding these factors can help them take specific measures to reduce failures. Lastly, the team can provide additional training to drivers or operators in regions with higher repair counts. This will ensure that the fleet is used and maintained properly, leading to fewer breakdowns. By making use of this information, the fleet maintenance team can improve their operations, reduce maintenance costs, and enhance the reliability and efficiency of the fleet.

* 1. Which parts are being replaced most due to corrosion or rust?
     1. The parts being replaced the most due to corrosion or rust are Wheel Arch, Fender Replacement, Rocker Panel, Brake Line and several others with around 50 replacements.

A screen shot of a computer

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SELECT Repair AS PART\_REPAIR, COUNT(\*) AS NUMBER\_OF\_REPAIRS

FROM PartsMaintenance

WHERE UPPER(Reason) IN ('Corrosion','Rust')

GROUP BY PART\_REPAIR

ORDER BY NUMBER\_OF\_REPAIRS DESC;

* 1. Which parts are being replaced most because of mechanical failure or accident, like a flat tire or rock through the windshield?
     1. The parts being replaced most because of mechanical failure or accident, like a flat tire or rock through the windshield would be Tire Repair, Tire Replacement, and Windshield Replacement.

A black screen with white text

Description automatically generated

SELECT Repair AS PART\_REPAIR, COUNT(\*) AS NUMBER\_OF\_REPAIRS

FROM PartsMaintenance

WHERE UPPER(Reason) LIKE '%FLAT%' OR UPPER(Reason) LIKE '%CRACK%'

GROUP BY PART\_REPAIR

ORDER BY NUMBER\_OF\_REPAIRS DESC;

1. **Write a brief summary of your analysis** thattakes the information from Step 1 and presents it in a way that nontechnical stakeholders can understand.
   1. After analyzing the data, I found some important trends that can help us improve fleet maintenance. Firstly, the most frequently replaced part is the "Fuel tank," which needs attention to understand why it requires so many replacements. Secondly, the Midwest region experiences the highest number of part failures, indicating a need for more resources and maintenance focus in that area. Thirdly, parts like "Wheel Arch," "Fender replacement," and "Rocker Panel" are often replaced due to corrosion or rust issues, and we should prioritize preventive measures for these parts. Besides, I discovered that tire-related problems are quite common, with "Tire repair" being the most frequently replaced part due to mechanical failure or accidents. This shows the need for better tire maintenance practices and perhaps exploring more durable tire options.

With this information, the company enhanced maintenance schedule. For the Midwest region, they should allocate more resources and conduct frequent inspections to catch potential issues early. They need to stock more spare parts in regions with higher repair counts to reduce waiting time. Also, understanding specific regional factors can help them tailor the maintenance approach for better results.

1. **Outline the approach** that you took to conduct the analysis.
   1. What queries did you use to identify trends or themes in the data?
      1. To identify trends or themes in the data, I used SQL queries to retrieve specific information from the "Parts Maintenance" table. Here are the queries used:

To find the parts being replaced most frequently, I used the following query:

SELECT repair AS PART\_REPAIR, COUNT(\*) AS NUMBER\_OF\_REPAIRS

FROM Parts Maintenance

GROUP BY PART\_REPAIR

ORDER BY NUMBER\_OF\_REPAIRS DESC;

To determine the region experiencing the most part failures and replacements, I used the following query:

SELECT "SOUTHWEST" AS REGION, COUNT(\*) AS NUMBER\_OF\_REPAIRS

FROM PartsMaintenance

WHERE UPPER(state) IN ('AZ','NM','TX','OK')

UNION

SELECT "SOUTHEAST" AS REGION, COUNT(\*) AS NUMBER\_OF\_REPAIRS

FROM PartsMaintenance

WHERE UPPER(state) IN ('AR','LA','MS','AL','GA','FL','KY','TN','SC','NC','VA','WV','DE','MD')

UNION

SELECT "NORTHEAST" AS REGION, COUNT(\*) AS NUMBER\_OF\_REPAIRS

FROM PartsMaintenance

WHERE UPPER(state) IN ('PA','NJ','NY','CT','RI','MA','VT','NH','ME')

UNION

SELECT "MIDWEST" AS REGION, COUNT(\*) AS NUMBER\_OF\_REPAIRS

FROM PartsMaintenance

WHERE UPPER(state) IN ('ND','SD','KS','NE','MN','WI','IA','MO','MI','IN','IL','OH')

UNION

SELECT "WEST" AS REGION, COUNT(\*) AS NUMBER\_OF\_REPAIRS

FROM PartsMaintenance

WHERE UPPER(state) IN ('WA','ID','MT','OR','WY','CO','UT','NV','CA')

ORDER BY NUMBER\_OF\_REPAIRS DESC;

To identify parts replaced most due to corrosion or rust, I used the following query:

SELECT Repair AS PART\_REPAIR, COUNT(\*) AS NUMBER\_OF\_REPAIRS

FROM PartsMaintenance

WHERE UPPER(Reason) IN ('Corrosion','Rust')

GROUP BY PART\_REPAIR

ORDER BY NUMBER\_OF\_REPAIRS DESC;

To find the parts that required being replaced most because of mechanical failure or accident, like a flat tire or rock through the windshield I used the query:

SELECT Repair AS PART\_REPAIR, COUNT(\*) AS NUMBER\_OF\_REPAIRS

FROM PartsMaintenance

WHERE UPPER(Reason) LIKE '%FLAT%' OR UPPER(Reason) LIKE '%CRACK%'

GROUP BY PART\_REPAIR

ORDER BY NUMBER\_OF\_REPAIRS DESC;

* 1. What are the benefits of using these queries to retrieve the information in a way that allows you to provide valuable information to your stakeholders?
     1. I can think of many benefits of using these queries to retrieve information and provide valuable insights to stakeholders. Firstly, these queries help identify the most frequently replaced parts, allowing the fleet maintenance team to prioritize and focus on parts that need more attention and preventive measures. Secondly, the company will be able to analyze regional differences in part failures and replacements, enabling the team to allocate resources efficiently and tailor maintenance strategies to specific regions. Thirdly, they will be able to highlight parts prone to corrosion or rust issues, guiding the team to implement better corrosion prevention methods and prolong the lifespan of these parts. Fourthly, the company can identify parts that are replaced most due to mechanical failures or accidents, such as flat tires or cracked windshields, enabling the team to take targeted measures to reduce such incidents and improve overall fleet safety. By using these queries, a data analyst can better understand the patterns in maintenance data, make informed decisions, and take proactive steps to enhance fleet reliability, reduce maintenance costs, and ensure safer operations. This information will allow us to optimize our maintenance schedules, allocate resources effectively, and ultimately provide a more reliable and efficient fleet service to all our stakeholders.

1. **Explain how the functions in the analysis tool** allowed you to organize the data and retrieve records quickly.
   1. The functions in the analysis tool helped me a lot in organizing the data and retrieving records quickly, making our analysis process much more efficient and insightful. The "SELECT" function allowed me to specify the data fields I wanted to retrieve, such as the part name and the number of replacements, making the output clear and relevant.

With the "GROUP BY" function, I could group the data based on the part names, which enabled me to see the number of replacements for each specific part. This grouping made it easy to identify the most frequently replaced parts and understand their overall impact on fleet maintenance.

The "COUNT" function helped me calculate the total number of replacements for each part, providing a quick and accurate summary of how often each part needed replacement. This allowed me to prioritize our attention and resources on parts that required more maintenance efforts.

The "ORDER BY" function allowed me to sort the data in descending order based on the number of replacements. This made it simple to identify the top parts with the highest replacement counts, such as the fuel tank and tires, which are critical components that need careful monitoring.

The "UNION" function was beneficial in combining the data from multiple queries representing different regions. By doing so, I could easily compare part failures and replacements across various regions of the country. This helped me identify that the Midwest region experienced the most part failures, indicating a need for a targeted approach in maintenance planning for that specific area.