Number of Contracts Concluded by Commercial Vehicle Company, Vehicle Model, and Year of Manufacture

Objective: To provide insights into the number of contracts concluded by different commercial vehicle companies, vehicle models, and their respective years of manufacture.

Data Source: https://od.data.gov.sa/Data/en/dataset/number-of-contracts

Usage:

```
import pandas as pd
# Load the Excel file as a DataFrame using the built-in function
df =
pd.read_excel('~/new_project/number-of-contracts-concluded-by-commercial-vehi
cle-company-vehicle-model-and-year-of-manufactu.xlsx')
```

Dataset Description:

The dataset contains information about the number of contracts concluded by various commercial vehicle companies, categorized by vehicle models and the respective manufacturing years. It is stored in an Excel file format.

Columns:

Company: Name of the commercial vehicle company.
Model name: Name or code of the vehicle model.
Model year: Year of manufacture of the vehicle.
Contract count: Number of contracts concluded for a specific company, model, and year.

Data Handling:

- Dataset is loaded as a Dataframe named `df`.
- Then the first row of the dataframe is removed as it's just the title and we don't need this for our evaluation.
- To facilitate the translation of Arabic text to English using the Google Translator API for increased usability and analysis.

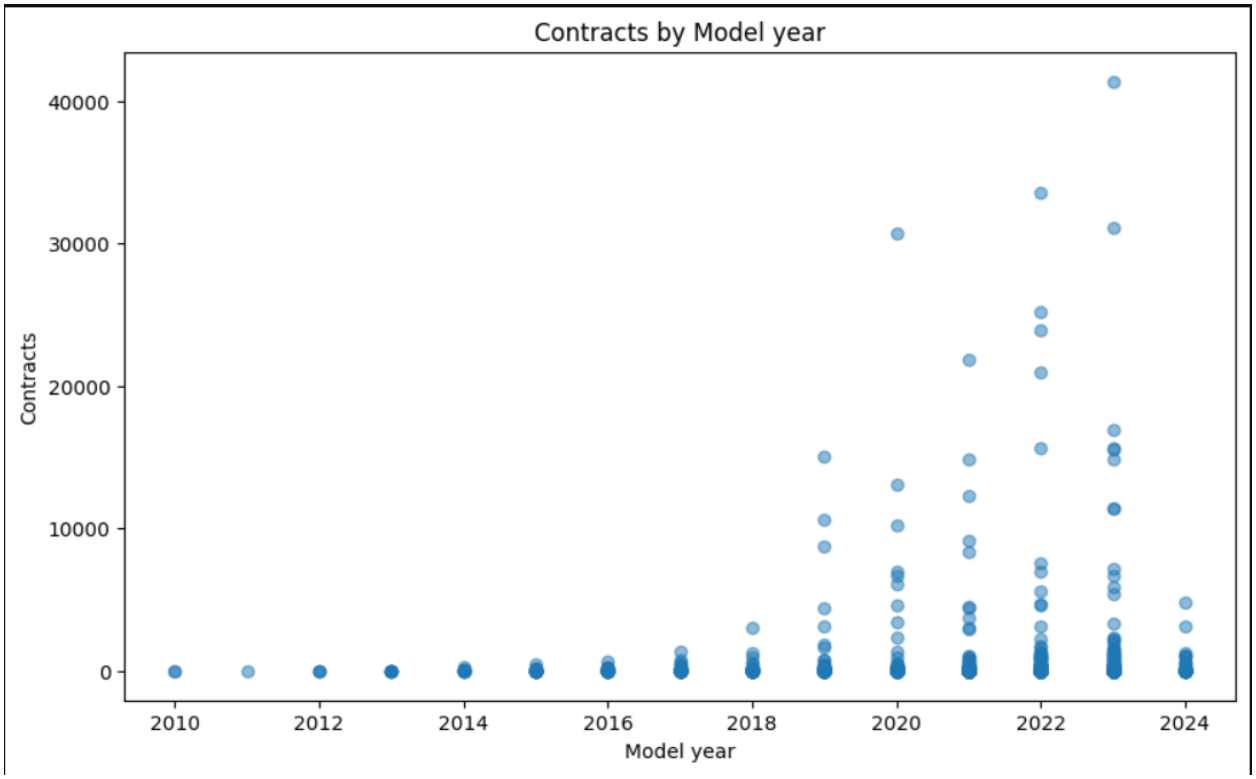
```
from deep_translator import GoogleTranslator

def translate_text(text):
    try:
```

```
        # Attempting translation from Arabic to English
        translation = GoogleTranslator(source='ar',
target='en').translate(text)
        return translation  # Return the translated text
    except Exception as e:
        print(f"Translation Error: {e}")  # Display any translation error
        return "Translation Error"  # Return an error message in case of
translation failure
```

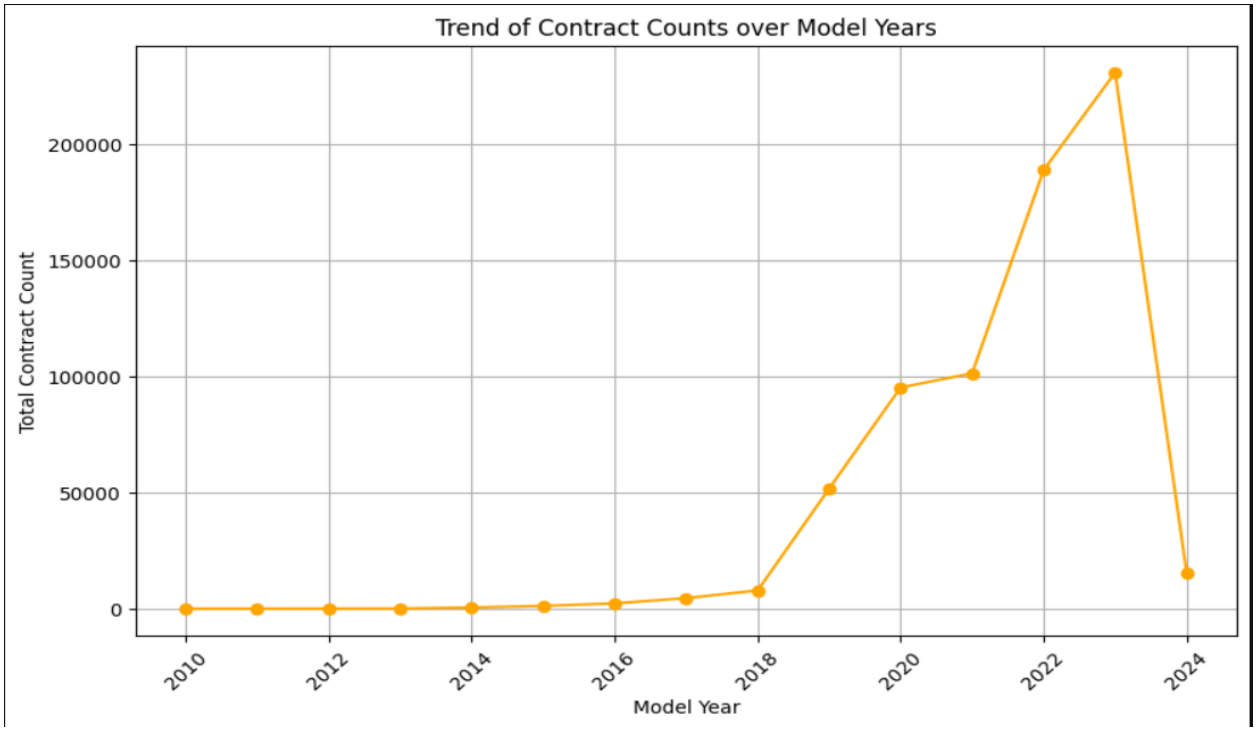
- Then we renamed the columns and dropped 2 translated columns as we didn't need them anymore.
- We saved our newly translated dataframe into a csv file so that we don't have to do it from scratch as new `new_file.csv`

Data Visualization:

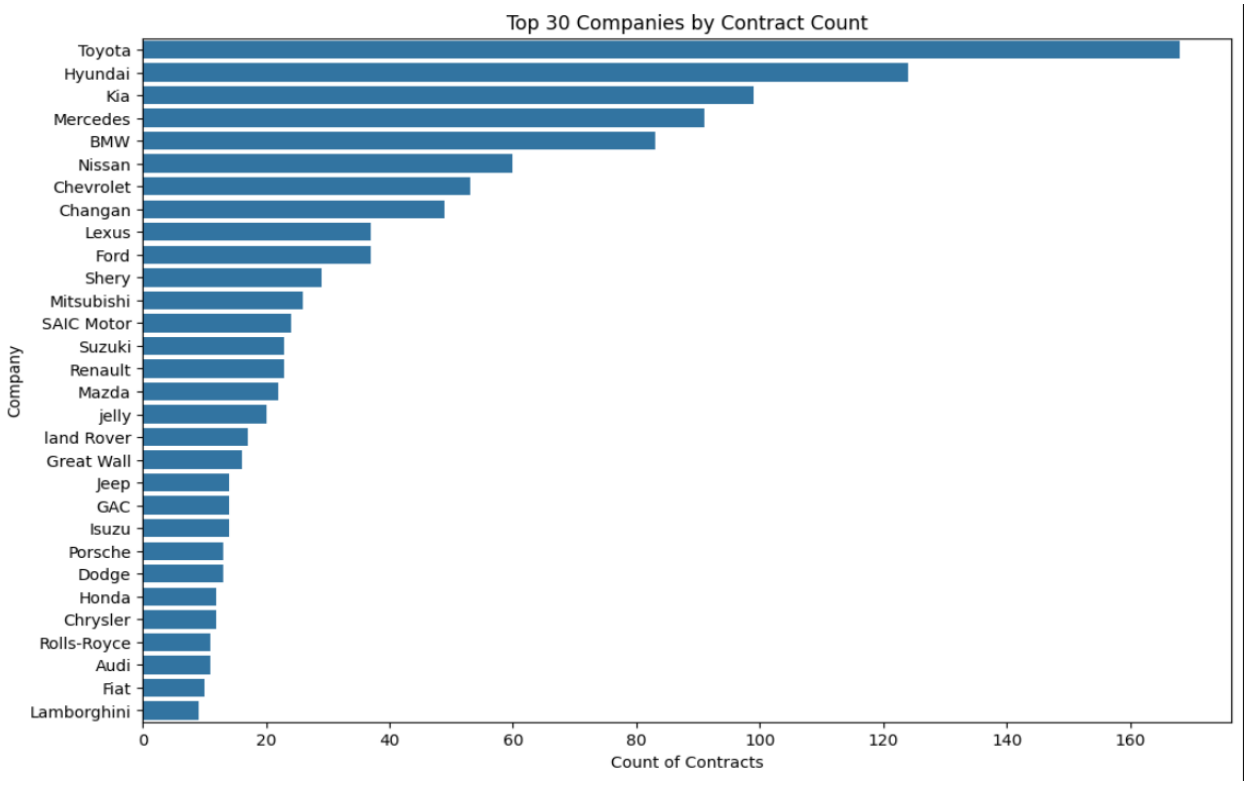
- By looking at this scatterplot for the number of contracts per year, you can see that the newer models are contracted more often then the older versions as they are more reliable and requires less maintenance.



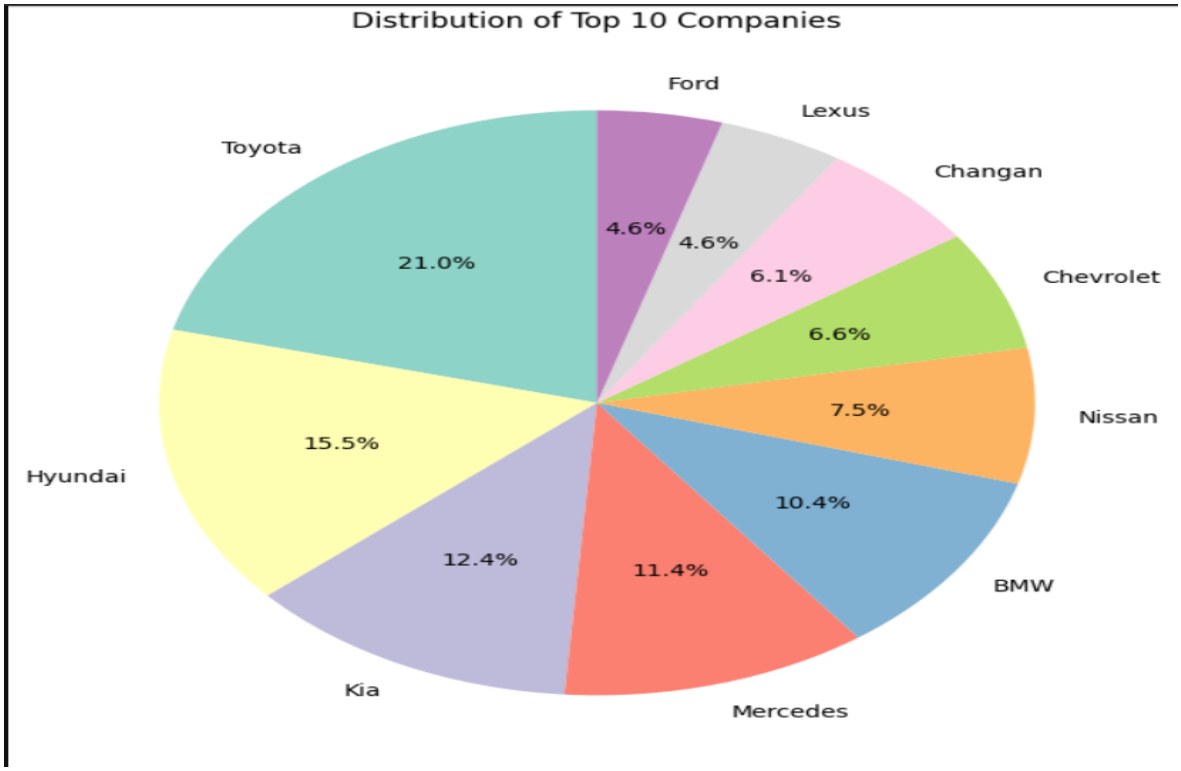
- The same trend can be observed through the line graph below that show the number of contracts per model year.



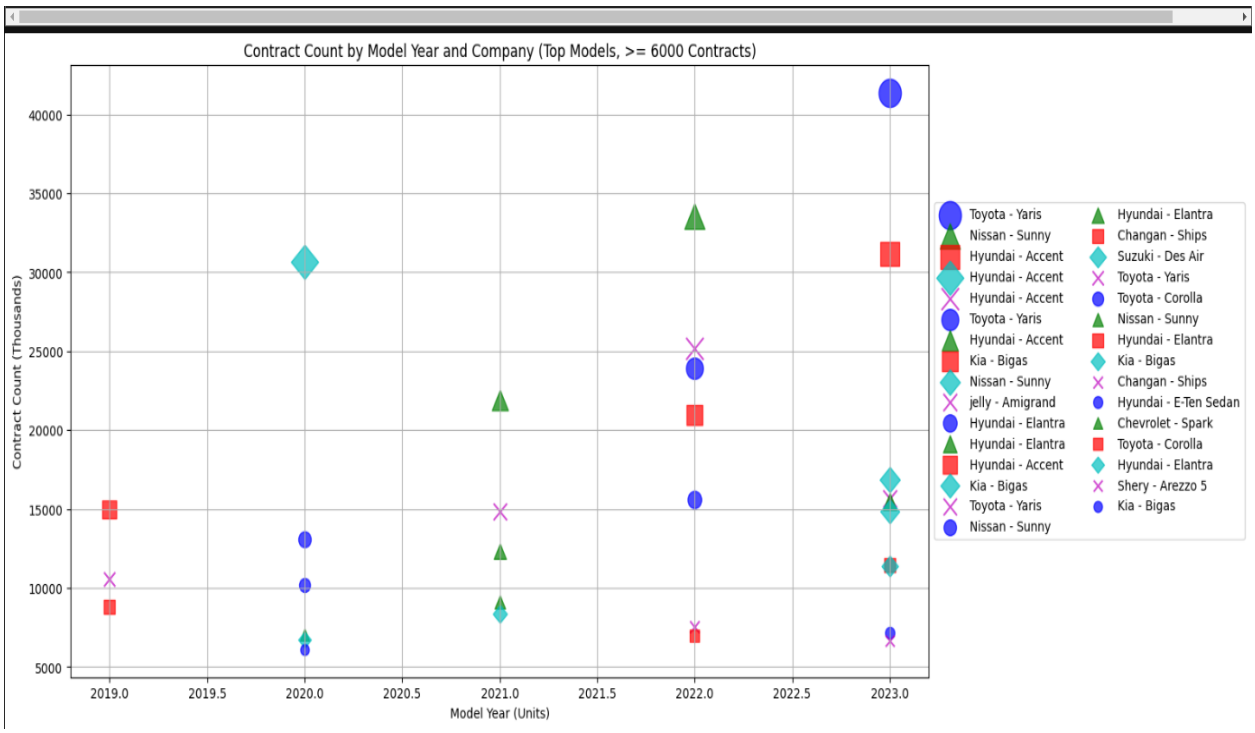
- By looking at the picture below we can see that the top 30 manufacturers by contracts count. Not to mention the top 7 trusted and reliable brands are Toyota, Hyundai, kia, Mercedes, BMW, Nissan and Chevrolet.



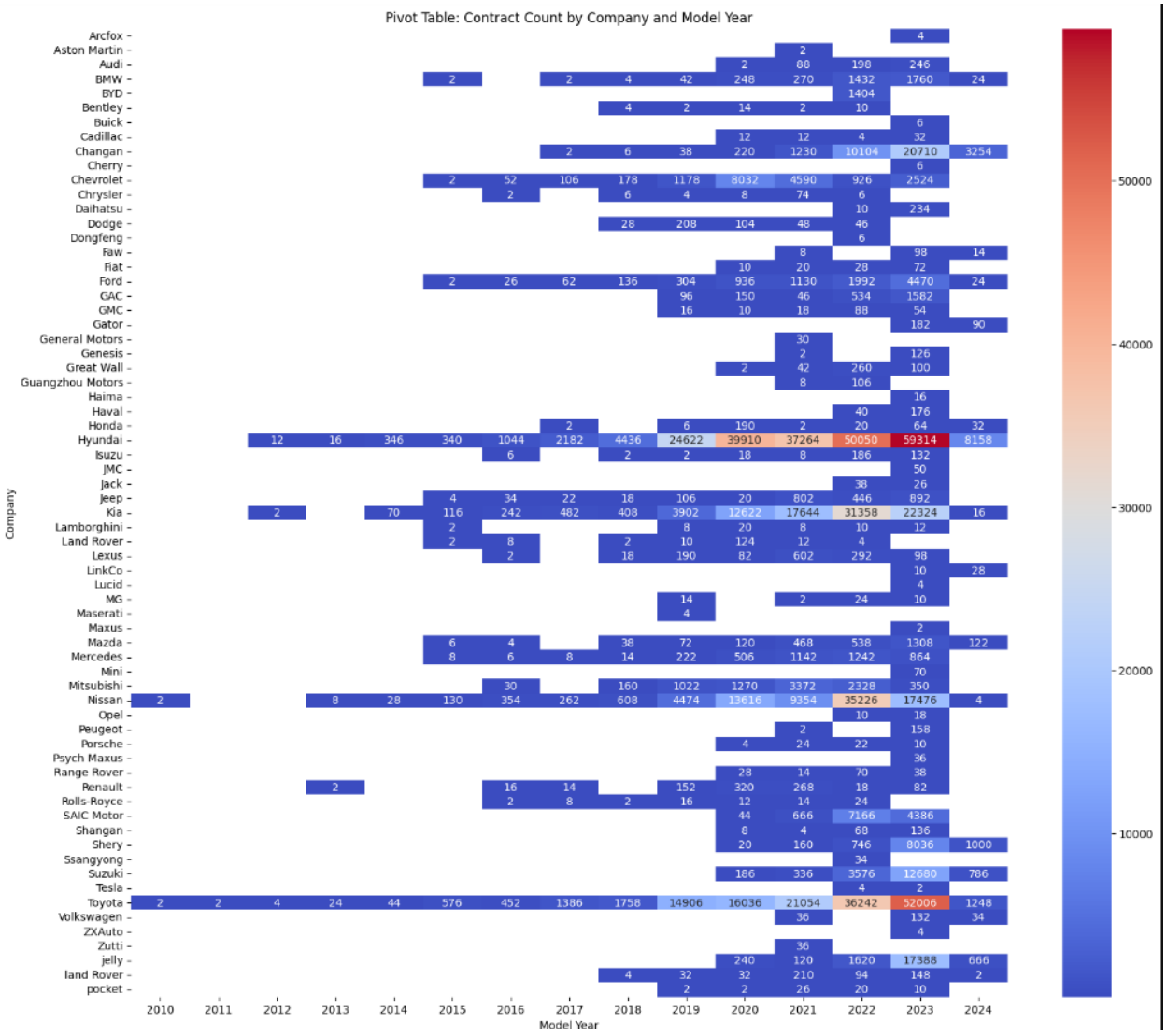
- By looking at the pie chart below, the distribution of the top 10 companies by percentage can be observed. Toyota, Hyundai and KIa alone almost covered half of the distribution.



- The figure below visualizes the companies with their models where the contracts count is more than 6000 for all the companies.



- Below is the pivot table for all the models in the datasets with their contract counts.



Statistical analysis:

Using linear regression to find the top 10 models with highest predicted contract counts were calculated:

```
Coefficient: [93.05010044]
Intercept: -187469.64626489434
Top 10 models with the highest predicted contract counts:
      Model name  Contract count
34         Accent            4800
45          Ships            3092
```

70	E-Ten Sedan	1230
79	Elantra	1090
81	Corolla	1062
90	Arezzo 5	962
117	Amigrand	580
119	Des Air	554
126	Grand 01	508
191	Baleno	232

Going further, we predicted model for the year 2026 and following were the findings:

Nearest neighbors:

	Model year	Contract count	Company	Model name	Predicted Contract
85	2020	994	Mitsubishi	Atraj	491.556628
84	2022	1010	Kia	K5	677.656829
86	2018	992	Toyota	Corolla	305.456427
88	2022	982	SAIC Motor	MGGT	677.656829
87	2022	982	SAIC Motor	MG ZS	677.656829
89	2021	974	Hyundai	Kona Wagon	584.606729
90	2024	962	Shery	Arezzo 5	863.757030
83	2022	1042	Mitsubishi	Atraj	677.656829
91	2023	950	Hyundai	Grand 01	770.706929
92	2022	944	Mitsubishi	Space Star	677.656829

You can also find the correlation between all columns in the notebook attached.