Getting Started with Python

Vehicle Analysis Project

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Resources

1. [Vehicle Dataset (https://dasclab.uonbi.ac.ke/dstraining/vehicle_data.csv)](https://dasclab.uonbi.ac.ke/dstraining/vehicle_data.csv)
2. [Submission Portal (https://dasclab.uonbi.ac.ke/analytics/projects)](https://dasclab.uonbi.ac.ke/analytics/projects)

If you are having problems please refer to this document:

3. [Data Analysis with Python Pandas Notebook (https://dasclab.uonbi.ac.ke/dstraining/data-analysis-with-python-pandas.html)](https://dasclab.uonbi.ac.ke/dstraining/data-analysis-with-python-pandas.html)

Instructions

Import all the libraries listed in the first cell. Make sure all modules are installed.

Use the provided data set to answer the following:

Use `pandas` to come up with:

1. The titles and prices of **10** Cars with highest price
2. The titles and prices of 5 Buses & Microbuses with highest price
3. The titles and prices of 5 Trucks & Trailers with highest price

Plotting

Use **matplotlib** to come up with a plot indicating the **top 10 brands** that we have in the vehicle_dataset

Key performance Metrics:

- Ensure all the plots have a Title
- Ensure all plots have x labels and y labels where applicable
- Your plots should be clearly visible. Change the size of your plot to a comfortable width and height.
- Save all your plots

In [1]:
```
import os
import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
```

In [3]:
```
os.listdir()
```

Out[3]:
```
['.ipynb_checkpoints',
 'A. Teacher',
 'Alarms',
 'Android',
 'brightwizz',
 'brightwizz.html',
 'clean_stock_prices.csv',
 'COSTA RICA IN 4K 60fps (ULTRA HD) w_ Freefly Movi - YouTube.mp4',
 'data analysis',
 'desktop.ini',
 'eurotrucks2 - Shortcut.lnk',
 'FIFA19',
 'hello.css',
 'index',
 'konamiplay',
 'konamiplay.css',
 'Konamiplay.html',
 'Need for Speed - Most Wanted',
 'New folder',
 'nfs',
 'PHONE',
 'project-time-series-workbook.ipynb',
 'Python',
 'R x64 4.1.3.lnk',
 'R-STUDIO PROJECT',
 'result (1).html',
 'RStudio.lnk',
 's',
 'Spotify.lnk',
 'Sublime Text.lnk',
 'vehicle_data.csv',
 'vehicle_dataset_project.ipynb',
 'webpages',
 'WhatsApp.lnk',
 'WPS Office.lnk',
 'WPS PDF.lnk',
 'YouTube.lnk',
 'Zoom.lnk']
```

vehicle_data.csv should be listed in your output from the above cell

In [24]:
```
df = pd.read_csv('vehicle_data.csv')
df.head()
```

Out[24]:

	title	category	region	parent_region	condition	attrs	brand	color	model
0	Toyota Land Cruiser Prado 2016 Black	Cars	Mvita	Mombasa	Foreign Used	First registration, No faults	Toyota	Black	Land Cruiser Prado
1	Mazda Demio 2014 Brown	Cars	Langata	Nairobi	Foreign Used	First owner, No faults	Mazda	Brown	Demio
2	Clean NV300 Caravan 2014 Model Dielsel 16 Seater	Buses & Microbuses	Kilimani	Nairobi	Foreign Used	Nissan	Nissan	NaN	Caravan (Urvan)
3	Toyota Crown 2014 Pearl	Cars	Kilimani	Nairobi	Foreign Used	No faults	Toyota	Pearl	Crown
4	Honda Fit 2014 Black	Cars	Mvita	Mombasa	Foreign Used	No faults	Honda	Black	Fit

As an example I have shown the top 10 most expensive vehicles that are in *parent_region* Mombasa

In [ ]:
```
```

In [51]:
```
mask = df['category'] == 'Trucks & Trailers'
```

In [52]:
```
# all the rows in the dataFrame that have parent_region Mombasa
Buses_df = df[mask].copy()
Buses_df.head()
```

Out[52]:

	title	category	region	parent_region	condition	attrs	brand	color	mod
14	Very Clean Isuzu FRR Truck 2015 Model	Trucks & Trailers	Thome	Nairobi	Used	Used	Isuzu	White	SERIE
20	Truck Lorry	Trucks & Trailers	Shanzu	Mombasa	Used	Used	Ashok Leyland	NaN	19
27	Volvo NL12 for Sale	Trucks & Trailers	Embakasi	Nairobi	Used	Used	Volvo	NaN	Na
30	Mitsubishi Fuso Canter	Trucks & Trailers	Mombasa CBD	Mombasa	Used	Used	Mitsubishi	NaN	Na
36	Isuzu Elf,Year 2014manual Transmission	Trucks & Trailers	Mombasa CBD	Mombasa	Brand New	Brand New	Isuzu	NaN	Na

To get the highest price I will use the `nlargest` function

In [41]:
```
# top 10 vehicles with highest price
trucks_df.nlargest(5,'price')
```

Out[41]:

	title	category	region	parent_region	condition	attrs	brand	color	mo
195	Mercedes-Benz Actros	Trucks & Trailers	Thome	Nairobi	Used	Used	Mercedes-Benz	NaN	N
222	Tata Signa LPK-1618 Tipper 10 Ton	Trucks & Trailers	Nairobi Central	Nairobi	Brand New	Brand New	Tata	NaN	M&H Ri Tru
103	Shacman F2000 Tipper	Trucks & Trailers	Municipality	Meru	Used	Used	Shacman	NaN	N
176	Isuzu Forward 7 Tonne Freezer	Trucks & Trailers	Tudor	Mombasa	Used	Used	Isuzu	NaN	SERI
62	Isuzu Elf,Year 2015 Manual	Trucks & Trailers	Mombasa CBD	Mombasa	Brand New	Brand New	Isuzu	NaN	N

To get only the `titles`

In [42]:
```
trucks_df.nlargest(5,'price')[['title','category','price']]
```

Out[42]:

	title	category	price
195	Mercedes-Benz Actros	Trucks & Trailers	7500000
222	Tata Signa LPK-1618 Tipper 10 Ton	Trucks & Trailers	6000000
103	Shacman F2000 Tipper	Trucks & Trailers	5100000
176	Isuzu Forward 7 Tonne Freezer	Trucks & Trailers	4300000
62	Isuzu Elf,Year 2015 Manual	Trucks & Trailers	3650000

In [ ]:
```

```

The above output is what the question is asking for. So take a screenshot.

In [ ]:
```

```

Plotting

I will demonstrate how to solve the plotting challenge using the following question:

Use **matplotlib** to come up with a plot indicating the **top 5 regions** that we have in the vehicle_dataset

In [46]:
```
# get number of rows with same region
df['brand'].value_counts()
```

Out[46]:
```
Toyota           82
Nissan           33
Mitsubishi       32
Mazda            26
Subaru           22
Volkswagen       21
Isuzu            19
Honda            17
BMW              17
Mercedes-Benz     9
Suzuki            5
Lexus             4
Tata              2
Volvo             2
Ashok Leyland     2
Land Rover        1
Shacman           1
Other             1
Hyundai           1
Daihatsu          1
Audi              1
Name: brand, dtype: int64
```

In [47]:
```
# grab the top 5
df['brand'].value_counts()[:10]
```

Out[47]:
```
Toyota           82
Nissan           33
Mitsubishi       32
Mazda            26
Subaru           22
Volkswagen       21
Isuzu            19
Honda            17
BMW              17
Mercedes-Benz     9
Name: brand, dtype: int64
```

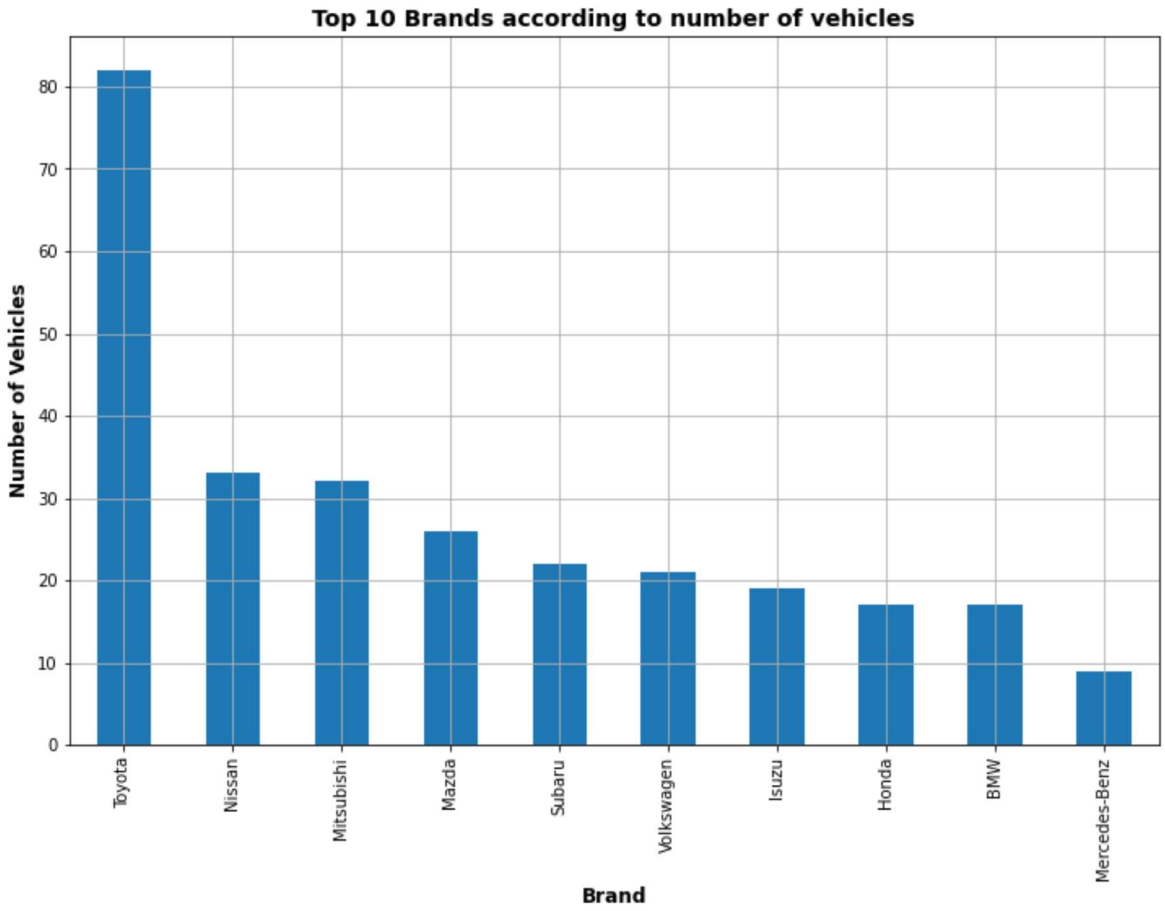
In [48]:
```
# make it a variable
top_5 = df['brand'].value_counts()[:10]
```

Now to create a bar plot of the top 5 regions

In [50]:
```
plt.figure(figsize=(12,8))
plt.title("Top 10 Brands according to number of vehicles", fontsize=14, fontw
top_5.plot.bar()
plt.xlabel('Brand',fontsize=12, fontweight='bold')
plt.ylabel('Number of Vehicles',fontsize=12, fontweight='bold')
plt.grid()

# save the plot to file
fig = plt.gcf()
fig.savefig('top-10-brands.png')

plt.show()
```



In [ ]:
```

```