

```
import os
import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
```

```
In [4]: df=pd.read_csv('vehicle_data.csv')
df.head()
```

	title	category	region	parent_region	condition	attrs	brand	color	model	yom	mileage	body_type	fuel	drive_train
0	Toyota Land Cruiser Prado 2016 Black	Cars	Mvita	Mombasa	Foreign Used	First registration, No faults	Toyota	Black	Land Cruiser Prado	2016.0	87000.0	NaN	NaN	NaN
1	Mazda Demio 2014 Brown	Cars	Langata	Nairobi	Foreign Used	First owner, No faults	Mazda	Brown	Demio	2014.0	92000.0	NaN	NaN	NaN
2	Clean NV300 2014 Diesel 16 Seater	Buses & Microbuses	Kilimani	Nairobi	Foreign Used		Nissan	Nissan	Caravan (Urban)	2014.0	180000.0	NaN	NaN	NaN
3	Toyota Crown 2014 Pearl	Cars	Kilimani	Nairobi	Foreign Used	No faults	Toyota	Pearl	Crown	2014.0	75000.0	NaN	NaN	NaN
4	Fit 2014 Black	Cars	Mvita	Mombasa	Foreign Used	No faults	Honda	Black	Fit	2014.0	58000.0	NaN	NaN	NaN

```
In [5]: # filter only rows that have Mombasa as their region
df['parent_region'] == 'Mombasa'
```

```
Out[5]:
0      True
1     False
2     False
3     False
4      True
...
295     True
296     True
297     True
298     False
299     True
Name: parent_region, Length: 300, dtype: bool
```

```
In [7]: mask = df['parent_region'] == 'Mombasa'
mask
```

```
Out[7]:
0      True
1     False
2     False
3     False
4      True
...
295     True
296     True
297     True
298     False
299     True
Name: parent_region, Length: 300, dtype: bool
```

```
In [8]: #call the rows in the dataframe that have parent_region Mombasa
mombasa_df = df[mask].copy()
mombasa_df.head()
```

	title	category	region	parent_region	condition	attrs	brand	color	model	yom	mileage	body_type	fuel	drive_train
0	Toyota Land Cruiser Prado 2016 Black	Cars	Mvita	Mombasa	Foreign Used	First registration, No faults	Toyota	Black	Land Cruiser Prado	2016.0	87000.0	NaN	NaN	NaN
4	Honda Fit 2014 Black	Cars	Mvita	Mombasa	Foreign Used	No faults	Honda	Black	Fit	2014.0	58000.0	NaN	NaN	NaN
5	Mitsubishi Delica 2013 White	Cars	Mvita	Mombasa	Foreign Used	First registration, No faults, Unpainted	Mitsubishi	White	Delica	2013.0	88000.0	NaN	NaN	NaN
6	New Toyota Premio 2013 Red	Cars	Mvita	Mombasa	Brand New	No faults, First registration	Toyota	Red	Premio	2013.0	45000.0	NaN	NaN	NaN
7	Toyota Sienta 2014.15 AWD Gray	Cars	Ganjeni	Mombasa	Foreign Used	No faults	Toyota	Gray	Sienta	2014.0	51000.0	Minivan	Petrol	All Wheel Drive

```
In [9]: # top 10 vehicles with highest price
mombasa_df.nlargest(10,'price')
```

	title	category	region	parent_region	condition	attrs	brand	color	model	yom	mileage	body_type	fuel	drive_train
22	Lexus RX 2016 Black	Cars	Mombasa CBD	Mombasa	Foreign Used	No faults	Lexus	Black	RX	2016.0	NaN	NaN	NaN	NaN
224	Toyota Hilux 2016 Black	Cars	Mombasa CBD	Mombasa	Foreign Used	First registration	Toyota	Black	Hilux	2016.0	36000.0	NaN	NaN	NaN
0	Toyota Land Cruiser Prado 2016 Black	Cars	Mvita	Mombasa	Foreign Used	First registration, No faults	Toyota	Black	Land Cruiser Prado	2016.0	87000.0	NaN	NaN	NaN
53	Toyota Land Cruiser Prado 2015 2.7 VVT-i Brown	Cars	Mvita	Mombasa	Foreign Used	No faults	Toyota	Brown	Land Cruiser Prado	2015.0	45260.0	SUV	Petrol	4WD
241	BMW X5 2015 White	Cars	Mombasa CBD	Mombasa	Foreign Used	First registration	BMW	White	X5	2015.0	68000.0	SUV	Petrol	4WD
8	BMW X4 2015 xDrive35i Black	Cars	Mombasa CBD	Mombasa	Foreign Used	No faults	BMW	Black	X4	2015.0	63128.0	NaN	NaN	NaN
13	BMW 520i 2014 Black	Cars	Mombasa CBD	Mombasa	Foreign Used	First registration	BMW	Black	520i	2014.0	80000.0	NaN	NaN	NaN
73	Toyota Land Cruiser Prado 2014 2.7 VVT-i Gold	Cars	Mombasa CBD	Mombasa	Foreign Used	First owner, First registration	Toyota	Gold	Land Cruiser Prado	2014.0	NaN	SUV	Petrol	4WD
220	Volkswagen Touareg 2015 TDI Executive AWD 4MOT...	Cars	Tudor	Mombasa	Foreign Used	No faults	Volkswagen	Black	Touareg	2015.0	111285.0	SUV	Diesel	4WD
276	Lexus NX 2014 Red	Cars	Mombasa CBD	Mombasa	Foreign Used	No faults	Lexus	Red	NX	2014.0	NaN	NaN	NaN	NaN

```
In [10]: # top 10 vehicles with highest price, to only get the titles
mombasa_df.nlargest(10,'price')[['title','category','price']]
```

	title	category	price
22	Lexus RX 2016 Black	Cars	14500000
224	Toyota Hilux 2016 Black	Cars	9000000
0	Toyota Land Cruiser Prado 2016 Black	Cars	6500000
53	Toyota Land Cruiser Prado 2015 2.7 VVT-i Brown	Cars	6500000
241	BMW X5 2015 White	Cars	6300000
8	BMW X4 2015 xDrive35i Black	Cars	5800000
13	BMW 520i 2014 Black	Cars	5700000
73	Toyota Land Cruiser Prado 2014 2.7 VVT-i Gold	Cars	5600000
220	Volkswagen Touareg 2015 TDI Executive AWD 4MOT...	Cars	5500000
276	Lexus NX 2014 Red	Cars	5400000

```
In [11]: mombasa_df
```

	title	category	region	parent_region	condition	attrs	brand	color	model	yom	mileage	body_type	fuel	drive_train
0	Toyota Land Cruiser Prado 2016 Black	Cars	Mvita	Mombasa	Foreign Used	First registration, No faults	Toyota	Black	Land Cruiser Prado	2016.0	87000.0	NaN	NaN	NaN
4	Honda Fit 2014 Black	Cars	Mvita	Mombasa	Foreign Used	No faults	Honda	Black	Fit	2014.0	58000.0	NaN	NaN	NaN
5	Mitsubishi Delica 2013 White	Cars	Mvita	Mombasa	Foreign Used	First registration, No faults, Unpainted	Mitsubishi	White	Delica	2013.0	88000.0	NaN	NaN	NaN
6	New Toyota Premio 2013 Red	Cars	Mvita	Mombasa	Brand New	No faults, First registration	Toyota	Red	Premio	2013.0	45000.0	NaN	NaN	NaN
7	Toyota Sienta 2014 1.5 AWD Gray	Cars	Ganjeni	Mombasa	Foreign Used	No faults	Toyota	Gray	Sienta	2014.0	51000.0	Minivan	Petrol	4WD
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
294	Subaru Outback 2014 White	Cars	Mvita	Mombasa	Foreign Used	No faults	Subaru	White	Outback	2014.0	63142.0	NaN	NaN	NaN
295	Toyota Allion 2008 Silver	Cars	Ganjeni	Mombasa	Kenyan Used	No faults	Toyota	Silver	Allion	2008.0	176549.0	NaN	NaN	NaN
296	Mitsubishi Fuso Trucks & Trailers	Trucks & Trailers	Kisumu	Mombasa	Used	Used	Mitsubishi	NaN	NaN	2006.0	NaN	NaN	NaN	NaN
297	Mitsubishi Fuso Refrigerated	Trucks & Trailers	Kisumu	Mombasa	Used	Used	Mitsubishi	NaN	Canter	2014.0	NaN	NaN	NaN	Diesel
299	Subaru Forester 2015 Matt Black	Cars	Mombasa CBD	Mombasa	Foreign Used	Unpainted, Original parts, First registration	Subaru	Matt Black	Forester	2015.0	86910.0	NaN	NaN	NaN

147 rows x 15 columns

```
In [12]: df = pd.read_csv('vehicle_data.csv')
df.head()
```

	title	category	region	parent_region	condition	attrs	brand	color	model	yom	mileage	body_type	fuel	drive_train
0	Toyota Land Cruiser Prado 2016 Black	Cars	Mvita	Mombasa	Foreign Used	First registration, No faults	Toyota	Black	Land Cruiser Prado	2016.0	87000.0	NaN	NaN	NaN
1	Mazda Demio 2014 Brown	Cars	Langata	Nairobi	Foreign Used	First owner, No faults	Mazda	Brown	Demio	2014.0	92000.0	NaN	NaN	NaN
2	Clean NV300 2014 Diesel 16 Seater	Buses & Microbuses	Kilimani	Nairobi	Foreign Used		Nissan	Nissan	Caravan (Urban)	2014.0	180000.0	NaN	NaN	NaN
3	Toyota Crown 2014 Pearl	Cars	Kilimani	Nairobi	Foreign Used	No faults	Toyota	Pearl	Crown	2014.0	75000.0	NaN	NaN	NaN
4	Fit 2014 Black	Cars	Mvita	Mombasa	Foreign Used	No faults	Honda	Black	Fit	2014.0	58000.0	NaN	NaN	NaN

```
In [13]: df=df[df['category']=='Cars']
df.nlargest(5,'price')[['title','category','price']]
```

	title	category	price
22	Lexus RX 2016 Black	Cars	14500000
265	New Hyundai Palisade 2021 White	Cars	9500000
224	Toyota Hilux 2016 Black	Cars	9000000
156	Toyota Land Cruiser 2010 4.6 V8 ZX Black	Cars	8799999
249	Toyota Land Cruiser 2014 4.6 V8 ZX Black	Cars	8199999

```
In [14]: df=df[df['category']=='Cars']
df.nlargest(5,'price')[['title','category','price']]
```

	title	category	price
22	Lexus RX 2016 Black	Cars	14500000
265	New Hyundai Palisade 2021 White	Cars	9500000
224	Toyota Hilux 2016 Black	Cars	9000000
156	Toyota Land Cruiser 2010 4.6 V8 ZX Black	Cars	8799999
249	Toyota Land Cruiser 2014 4.6 V8 ZX Black	Cars	8199999

```
In [15]: df = pd.read_csv('vehicle_data.csv')
df.head()
```

	title	category	region	parent_region	condition	attrs	brand	color	model	yom	mileage	body_type	fuel	drive_train
0	Toyota Land Cruiser Prado 2016 Black	Cars	Mvita	Mombasa	Foreign Used	First registration, No faults	Toyota	Black	Land Cruiser Prado	2016.0	87000.0	NaN	NaN	NaN
1	Mazda Demio 2014 Brown	Cars	Langata	Nairobi	Foreign Used	First owner, No faults	Mazda	Brown	Demio	2014.0	92000.0	NaN	NaN	NaN
2	Clean NV300 2014 Diesel 16 Seater	Buses & Microbuses	Kilimani	Nairobi	Foreign Used		Nissan	Nissan	Caravan (Urban)	2014.0	180000.0	NaN	NaN	NaN
3	Toyota Crown 2014 Pearl	Cars	Kilimani	Nairobi	Foreign Used	No faults	Toyota	Pearl	Crown	2014.0	75000.0	NaN	NaN	NaN
4	Fit 2014 Black	Cars	Mvita	Mombasa	Foreign Used	No faults	Honda	Black	Fit	2014.0	58000.0	NaN	NaN	NaN

```
In [18]: dfbus=df[df['category']=='Buses & Microbuses']
df.nlargest(5,'price')[['title','category','price']]
```

	title	category	price
22	Lexus RX 2016 Black	Cars	14500000
148	Mazda Bongo	Buses & Microbuses	11200000
265	New Hyundai Palisade 2021 White	Cars	9500000
224	Toyota Hilux 2016 Black	Cars	9000000
156	Toyota Land Cruiser 2010 4.6 V8 ZX Black	Cars	8799999

```
In [19]: dftrucks=df[df['category']=='Trucks & Trailers']
df.nlargest(5,'price')[['title','category','price']]
```

	title	category	price
22	Lexus RX 2016 Black	Cars	14500000
148	Mazda Bongo	Buses & Microbuses	11200000
265	New Hyundai Palisade 2021 White	Cars	9500000
224	Toyota Hilux 2016 Black	Cars	9000000
156	Toyota Land Cruiser 2010 4.6 V8 ZX Black	Cars	8799999

```
In [20]: # get number of rows with same region
df['region'].value_counts()
```

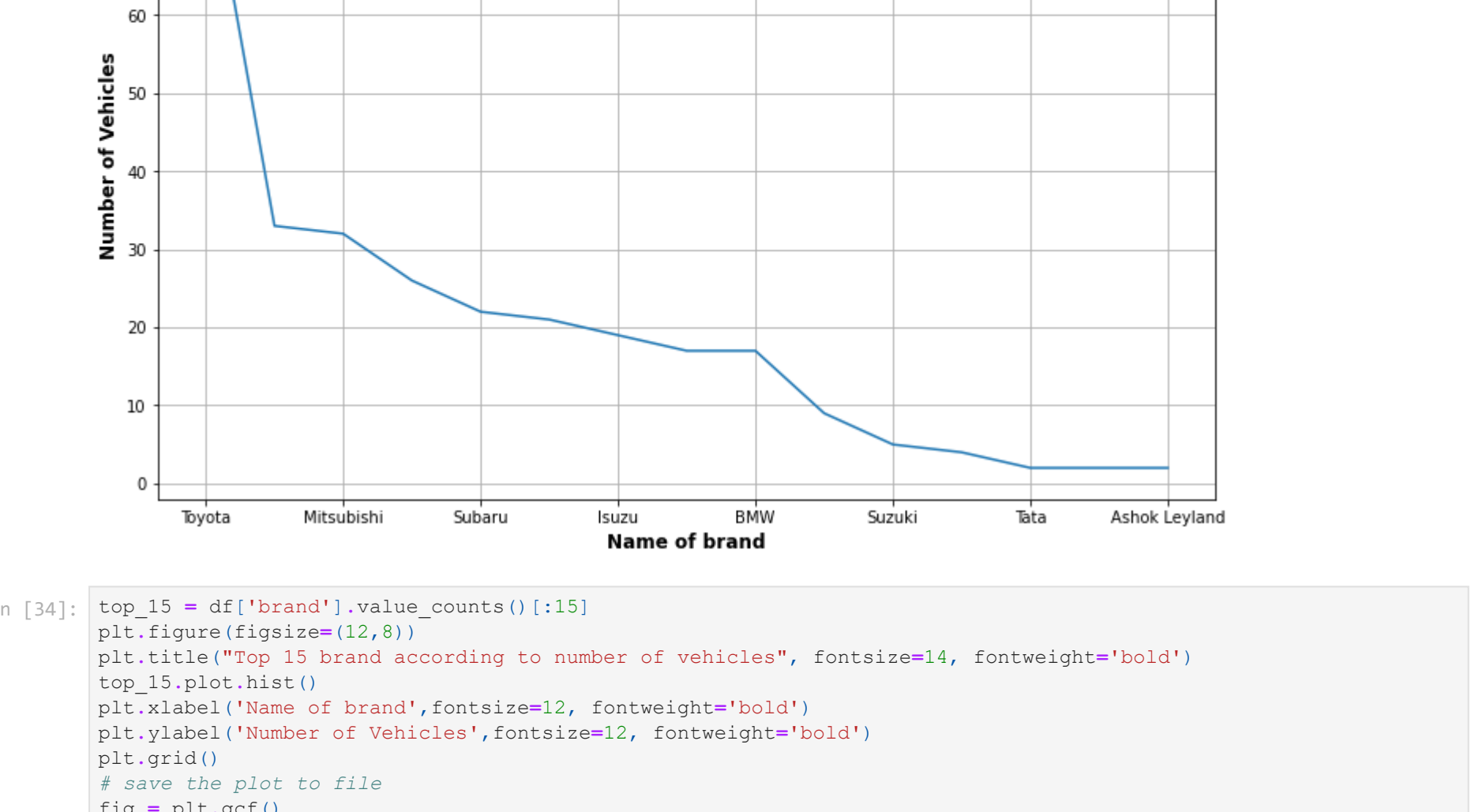
Mombasa CBD	92
Mvita	28
Nairobi Central	27
Kilimani	23
Lavington	16
Ridgeways	15
Tudor	13
Karen	8
Langata	7
Nairobi	6
Kileleshwa	4
Ganjeni	4
Kasarani	3
Nyali	3
Embakasi	3
Thome	3
Kisumu	3
Parklands/Highridge	3
Donslim	3
Mombasa Road	2
Nakuru Town West	2
Westlands	2
Runda	2
Kikuyu	2
Ruiru	2
Mbaraki	2
Nakuru Town East	2
Makadara	1
Ziwa la Ngombe	1
Shanzu	1
Imara Daima	1
Majengo	1
Kiambaa	1
Ngara	1
Ngong	1
Kiamba / Kiambu	1
Machakos Town	1
Woodley/Kenyatta Golf Course	1
Thika	1
Changame	1
Kisumu Central	1
Ruai	1
Idoret CBD	1
Siokimau	1
Kerugoya	1
Municipality	1
Royambu	1
Name: region, dtype: int64	

```
In [24]: #to portray the top 15
df['region'].value_counts()[0:15]
```

Mombasa CBD	92
Mvita	28
Nairobi Central	27
Kilimani	23
Lavington	16
Ridgeways	15
Tudor	13
Karen	8
Langata	7
Nairobi	6
Kileleshwa	4
Ganjeni	4
Kasarani	3
Nyali	3
Embakasi	3
Name: region, dtype: int64	

```
In [26]: # make it a variable
top_15 = df['region'].value_counts()[0:15]
```

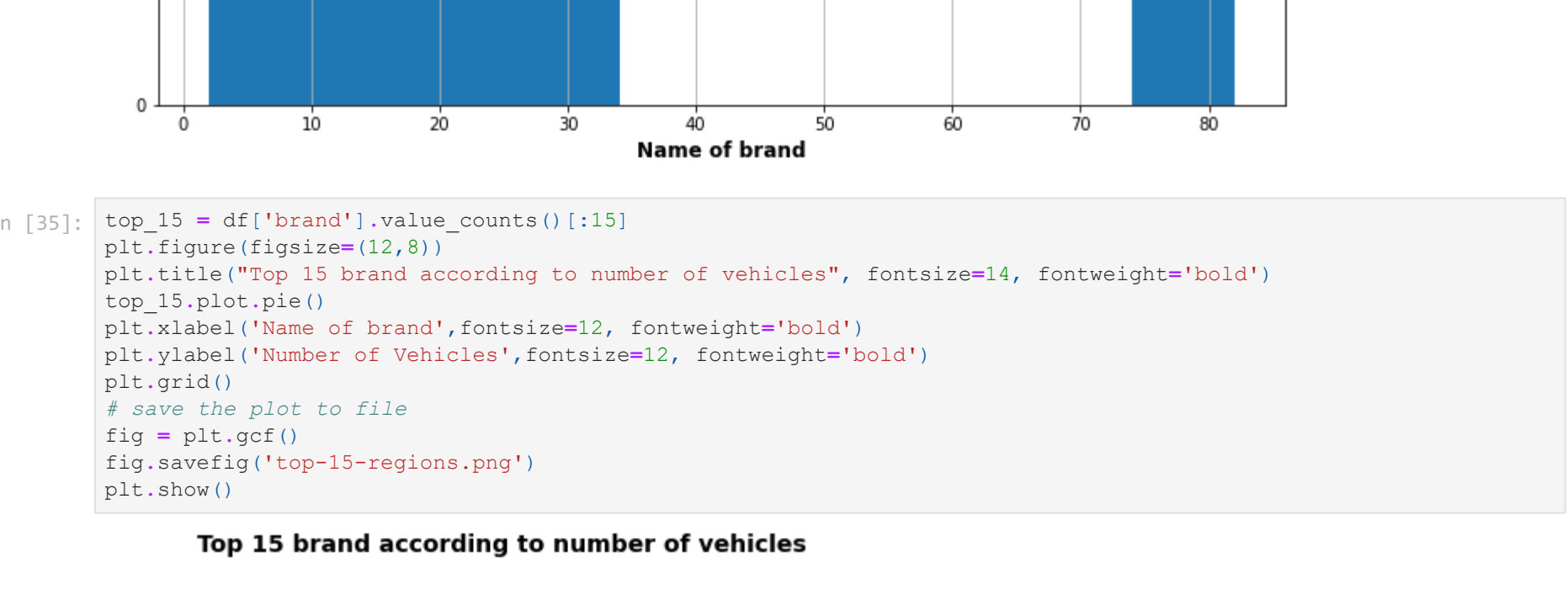
plt.figure(figsize=(12,8))
plt.title("Top 15 brands of vehicles", fontsize=14, fontweight='bold')
top_15.plot.bar()
plt.xlabel('Name of brand', fontsize=12, fontweight='bold')
plt.ylabel('Number of Vehicles', fontsize=12, fontweight='bold')
plt.grid()
save the plot to file
fig = plt.gcf()
fig.savefig('top-15-brands.png')
plt.show()



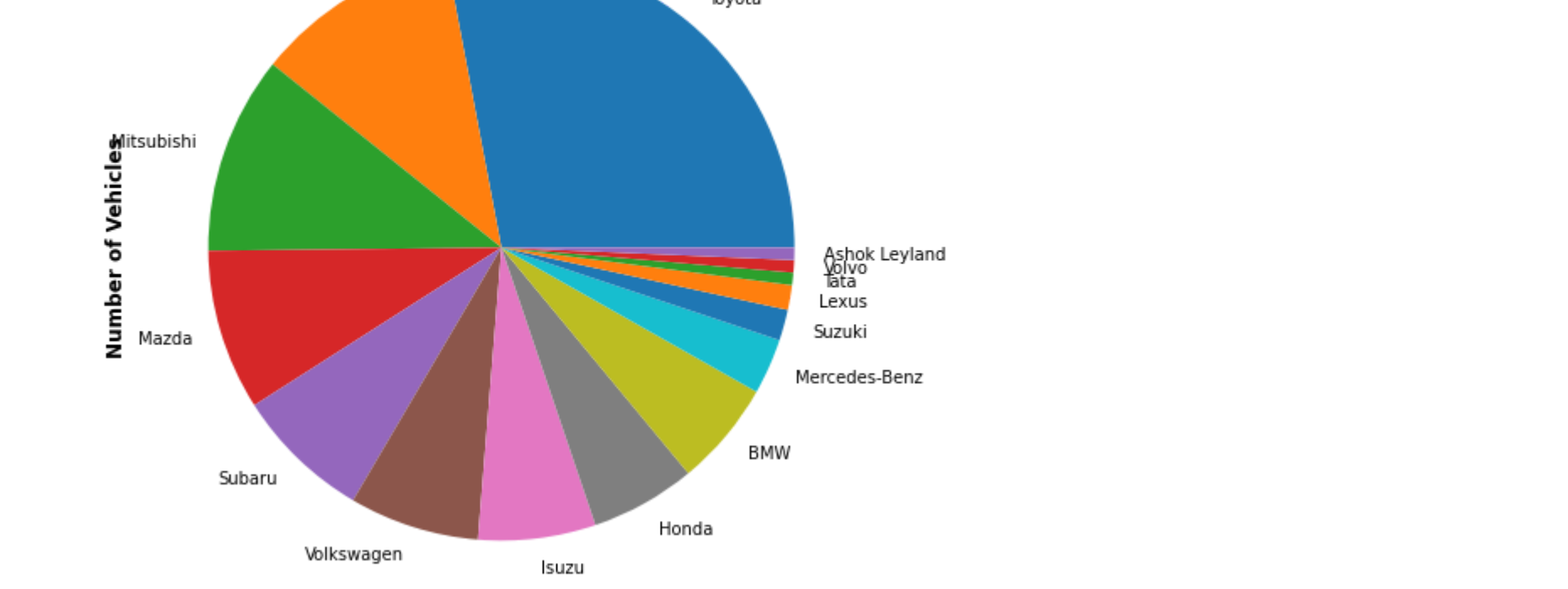
```
In [28]: df['brand'].value_counts()[0:15]
```

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
Name: brand, dtype: int64	

```
In [32]: top_15 = df['brand'].value_counts()[0:15]
plt.figure(figsize=(12,8))
plt.title("Top 15 brand according to number of vehicles", fontsize=14, fontweight='bold')
top_15.plot.bar()
```



```
In [33]: top_15 = df['brand'].value_counts()[0:15]
plt.figure(figsize=(12,8))
plt.title("Top 15 brand according to number of vehicles", fontsize=14, fontweight='bold')
top_15.plot.line()
```



```
In [35]: top_15 = df['brand'].value_counts()[0:15]
plt.figure(figsize=(12,8))
plt.title("Top 15 brand according to number of vehicles", fontsize=14, fontweight='bold')
top_15.plot.pie()
```

