Visualization Tool For Electric Vehicle Charge And Range Analysis

Teammates;

Team ID : NM2023TMID00695

Team Size : 4

Team Leader : R.Venkatesh

Team member : E.Suryaprakash

Team member : V.Thenaruvi

Team member : P.Sakthivel

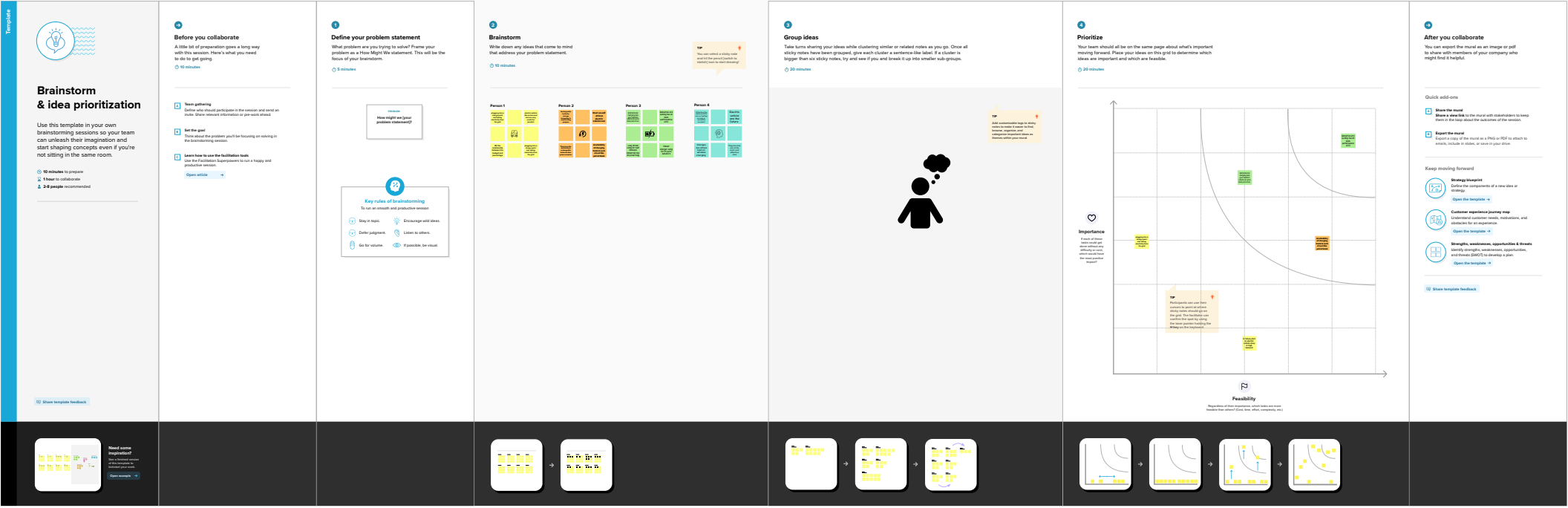
Project Flow

To accomplish this, we have to complete all the activities listed below,

- **Define Problem / Problem Understanding**
  - ✓ **Specify the business problem**
  - ✓ **Business requirement**
  - ✓ **Literature Survey**
  - ✓ **Social or Business Impact.**
- **Data Collection & Extraction from Database**
  - ✓ **Collect the dataset,**
  - ✓ **Storing Data in DB o Perform SQL Operations**
  - ✓ **Connect DB with Tableau**
- **Data Preparation**
  - ✓ **Prepare the Data for Visualization**
- **Data Visualizations**
  - ✓ **No of Unique Visualizations**
- **Dashboard**
  - ✓ **Responsive and Design of Dashboard**
- **Story**
  - ✓ **No of Scenes of Story**
- **Performance Testing o Amount of Data Rendered to DB**
  - ✓ **Utilization of Data Filters**
  - ✓ **No of Calculation Fields**
  - ✓ **No of Visualizations/ Graphs**
- **Web Integration**
  - ✓ **Dashboard and Story embed with UI With Flask**
- **Project Demonstration & Documentation**
  - ✓ **Record explanation Video for project end to end solution**
- **Project DocumentationStep by step project development procedure**

Task - 1

IDEATION FOR ELETRIC VEHICLE'S



Task-1

EMPATHY MAP FOR ELECTRIC VELHICLE'S

Template

Empathy map

Use this framework to develop a deep, shared understanding and empathy for other people. An empathy map helps describe the aspects of a user's experience, needs and pain points, to quickly understand your users' experience and mindset.

Share template feedback

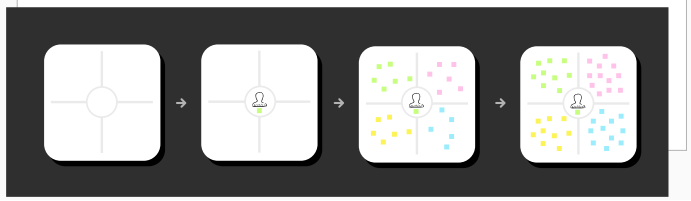
Need some inspiration?

See a finished version of this template to kickstart your work.

Open example →

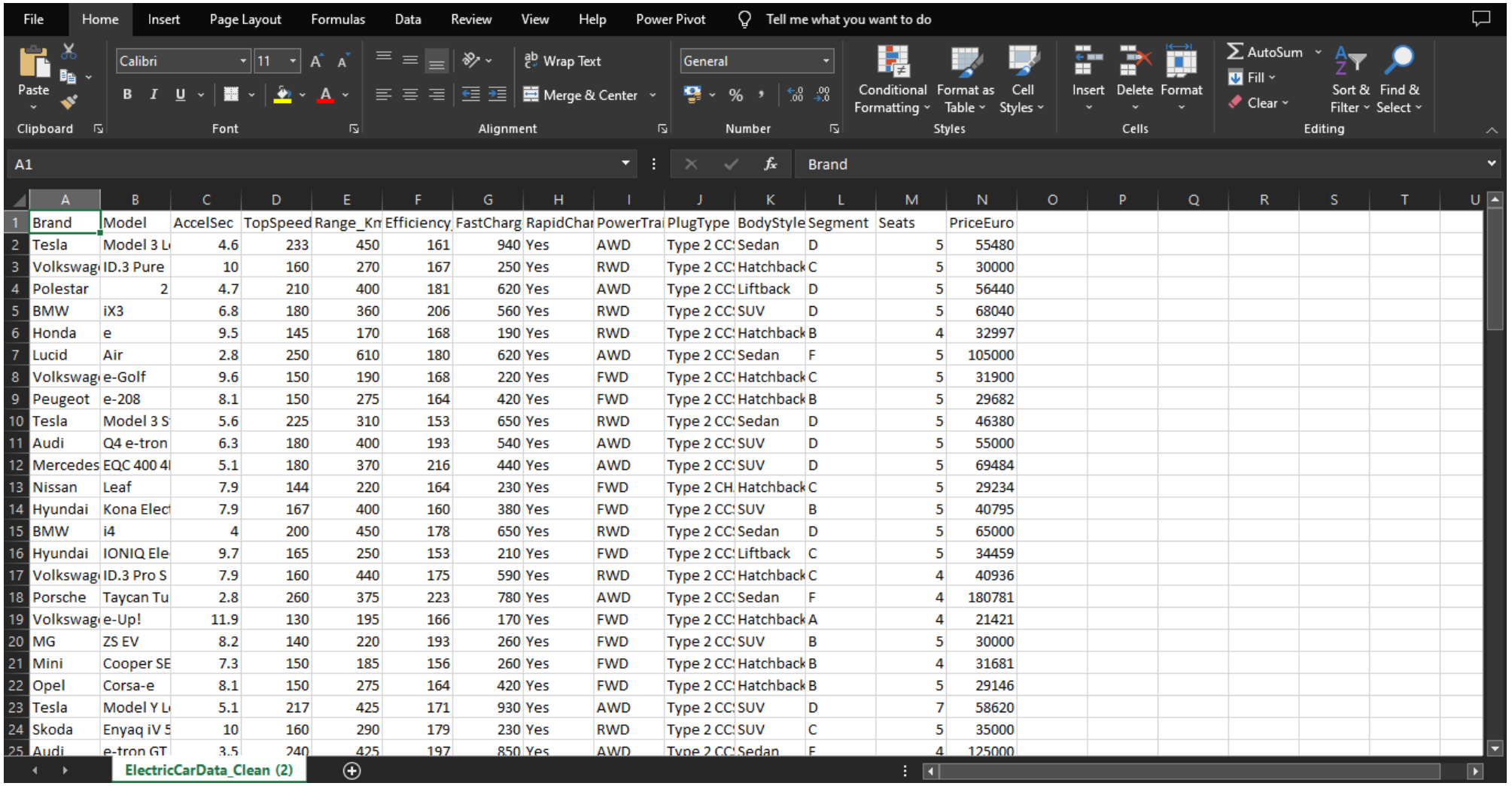
Build empathy

The information you add here should be representative of the observations and research you've done about your users.



Data Collection & Extraction from Database

Data collection is the process of gathering and measuring information on variables of interest, in an established systematic fashion that enables one to answer stated research questions, test hypotheses, and evaluate outcomes and generate insights from the data



File Home Insert Page Layout Formulas Data Review View Help Power Pivot Tell me what you want to do

Paste Calibri 11 Wrap Text General Conditional Formatting Format as Table Cell Styles Insert Delete Format AutoSum Fill Clear Sort & Filter Find & Select

Clipboard Font Alignment Number Styles Cells Editing

A1 Brand

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1	Brand	Model	AccelSec	TopSpeed	Range_Km	Efficiency	FastCharg	RapidChar	PowerTra	PlugType	BodyStyle	Segment	Seats	PriceEuro
2	Tesla	Model 3 L	4.6	233	450	161	940	Yes	AWD	Type 2 CC	Sedan	D	5	55480
3	Volkswag	ID.3 Pure	10	160	270	167	250	Yes	RWD	Type 2 CC	Hatchback	C	5	30000
4	Polestar	2	4.7	210	400	181	620	Yes	AWD	Type 2 CC	Liftback	D	5	56440
5	BMW	iX3	6.8	180	360	206	560	Yes	RWD	Type 2 CC	SUV	D	5	68040
6	Honda	e	9.5	145	170	168	190	Yes	RWD	Type 2 CC	Hatchback	B	4	32997
7	Lucid	Air	2.8	250	610	180	620	Yes	AWD	Type 2 CC	Sedan	F	5	105000
8	Volkswag	e-Golf	9.6	150	190	168	220	Yes	FWD	Type 2 CC	Hatchback	C	5	31900
9	Peugeot	e-208	8.1	150	275	164	420	Yes	FWD	Type 2 CC	Hatchback	B	5	29682
10	Tesla	Model 3 S	5.6	225	310	153	650	Yes	RWD	Type 2 CC	Sedan	D	5	46380
11	Audi	Q4 e-tron	6.3	180	400	193	540	Yes	AWD	Type 2 CC	SUV	D	5	55000
12	Mercedes	EQC 400 4	5.1	180	370	216	440	Yes	AWD	Type 2 CC	SUV	D	5	69484
13	Nissan	Leaf	7.9	144	220	164	230	Yes	FWD	Type 2 CH	Hatchback	C	5	29234
14	Hyundai	Kona Elec	7.9	167	400	160	380	Yes	FWD	Type 2 CC	SUV	B	5	40795
15	BMW	i4	4	200	450	178	650	Yes	RWD	Type 2 CC	Sedan	D	5	65000
16	Hyundai	IONIQ Ele	9.7	165	250	153	210	Yes	FWD	Type 2 CC	Liftback	C	5	34459
17	Volkswag	ID.3 Pro S	7.9	160	440	175	590	Yes	RWD	Type 2 CC	Hatchback	C	4	40936
18	Porsche	Taycan Tu	2.8	260	375	223	780	Yes	AWD	Type 2 CC	Sedan	F	4	180781
19	Volkswag	e-Up!	11.9	130	195	166	170	Yes	FWD	Type 2 CC	Hatchback	A	4	21421
20	MG	ZS EV	8.2	140	220	193	260	Yes	FWD	Type 2 CC	SUV	B	5	30000
21	Mini	Cooper SE	7.3	150	185	156	260	Yes	FWD	Type 2 CC	Hatchback	B	4	31681
22	Opel	Corsa-e	8.1	150	275	164	420	Yes	FWD	Type 2 CC	Hatchback	B	5	29146
23	Tesla	Model Y L	5.1	217	425	171	930	Yes	AWD	Type 2 CC	SUV	D	7	58620
24	Skoda	Enyaq iV 5	10	160	290	179	230	Yes	RWD	Type 2 CC	SUV	C	5	35000
25	Audi	e-tron GT	3.5	240	425	197	850	Yes	AWD	Type 2 CC	Sedan	F	4	125000

ElectricCarData_Clean (2)

DATA BASE FOR EV

1. EVIndia
2. Electric_vehicle_charging_station_list
3. ElectricCarData_Clean
4. Cheapestelectriccars-EVDatabase

DATA PREPARATION

Preparing the data for visualization involves cleaning the data to remove irrelevant or missing data, transforming the data into a format that can be easily visualized, exploring the data to identify patterns and trends, filtering the data to focus on specific subsets of data, preparing the data for visualization software, and ensuring the data is accurate and complete. This process helps to make the data easily understandable and ready for creating visualizations to gain insights into the performance and efficiency.

DATA VISUALIZATION

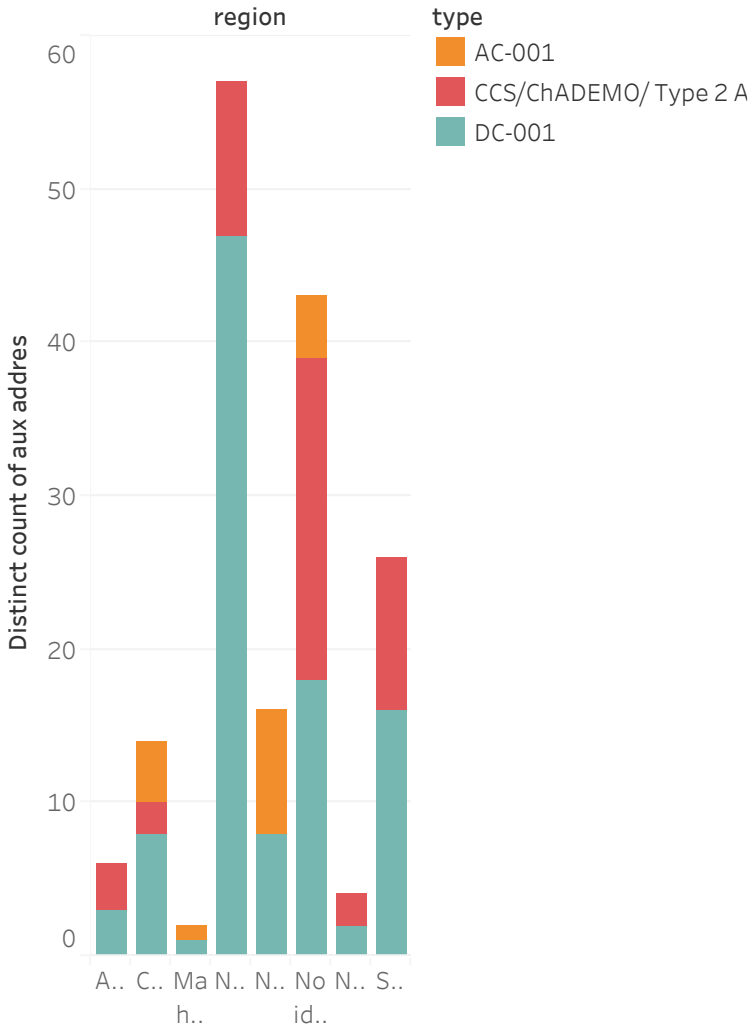
Data visualization is the process of creating graphical representations of data in order to help people understand and explore the information. The goal of data visualization is to make complex data sets more accessible, intuitive, and easier to interpret. By using visual elements such as charts, graphs, and maps, data visualizations can help people quickly identify patterns, trends, and outliers in the data.

Charging Stations by region and type in India

y

n

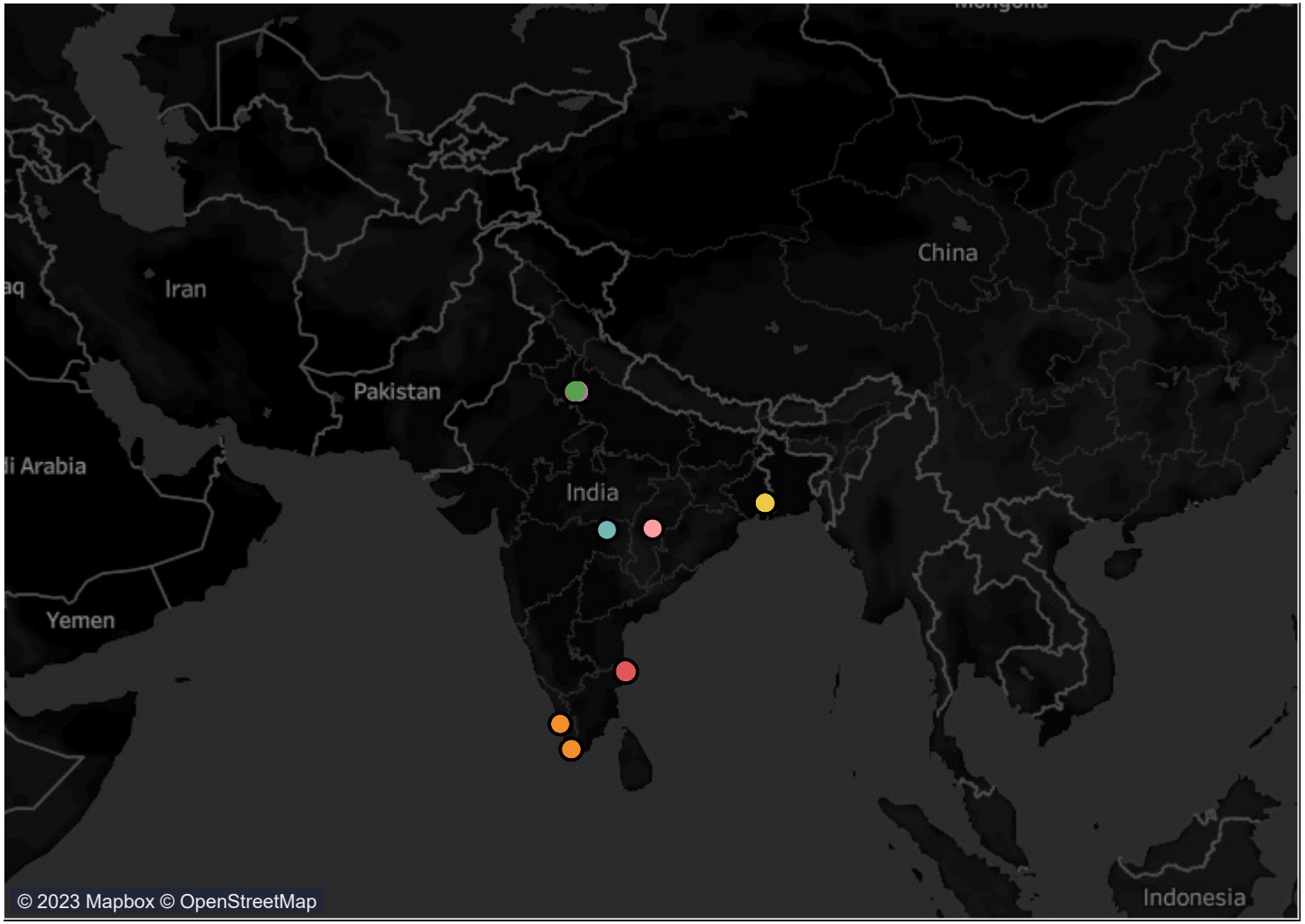
a



Distinct count of aux addres for each region. Color shows details about type. The view is filtered on region, l.

EV Charging stations map of India

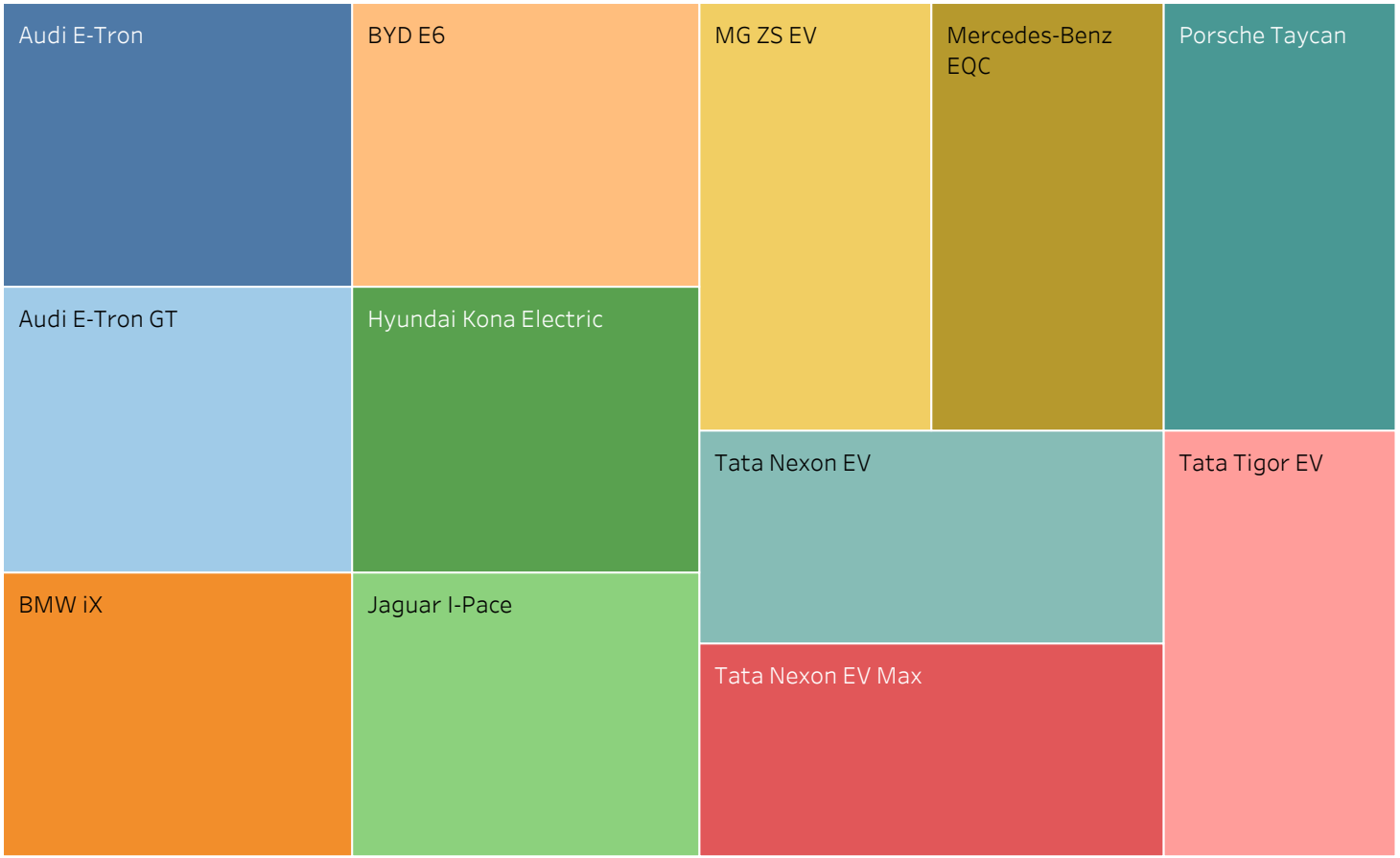
a



Map based on average of longitude and average of latitude. Color shows details about region. Details are shown for address and power.

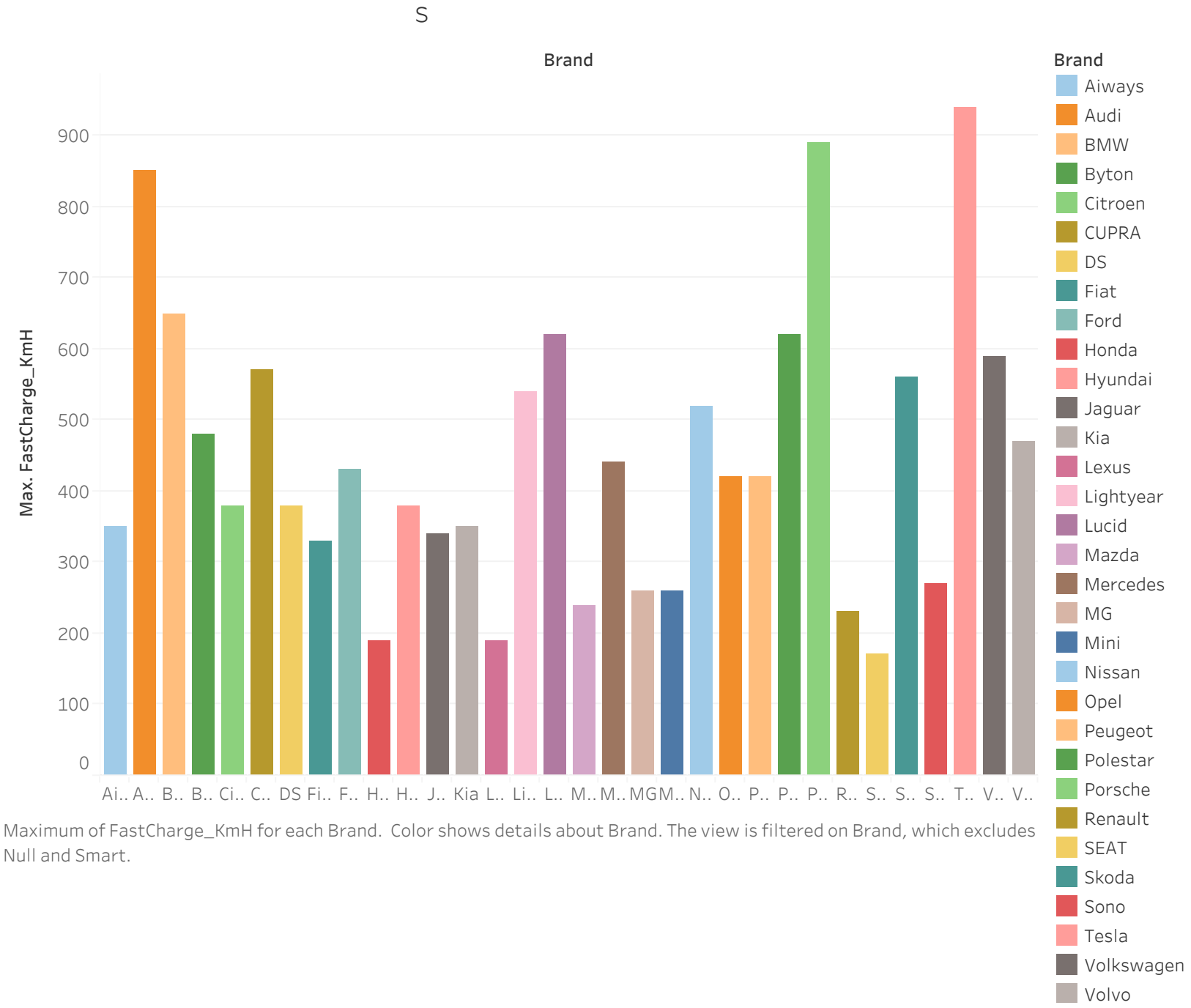
Different EV cars in India

a



Car. Color shows details about Car. Size shows distinct count of Style. The marks are labeled by Car. Details are shown for various dimensions.

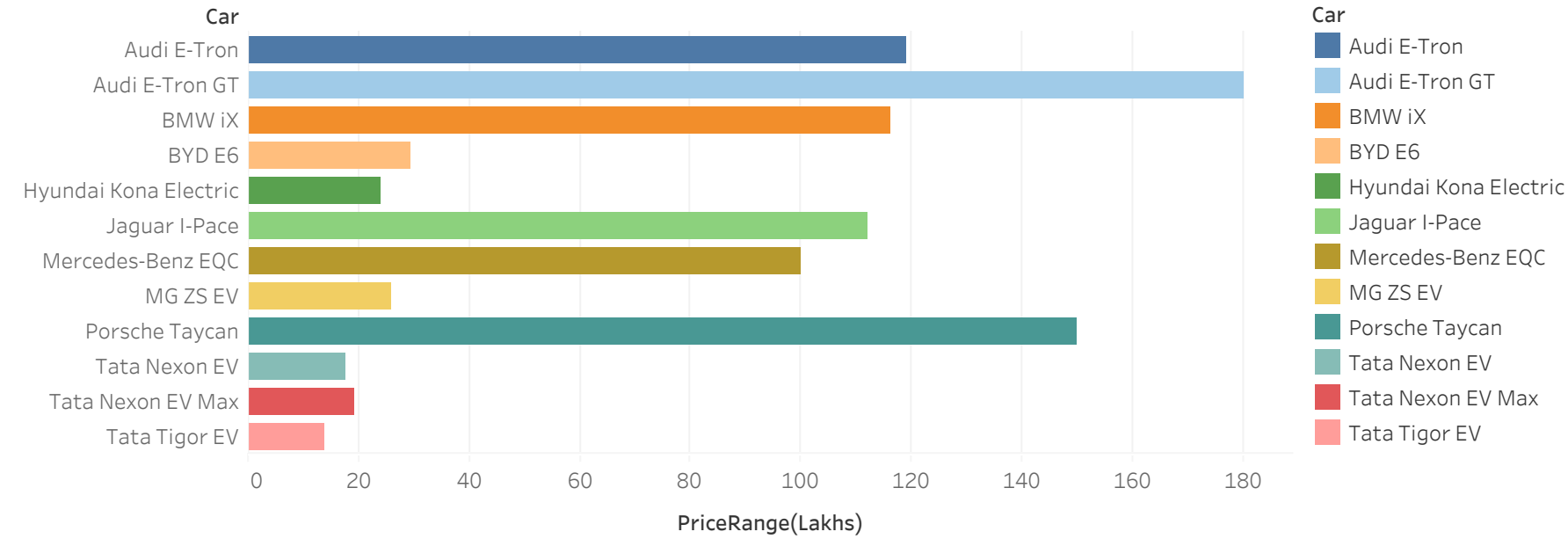
Top speed for different Brands



Maximum of FastCharge_KmH for each Brand. Color shows details about Brand. The view is filtered on Brand, which excludes Null and Smart.

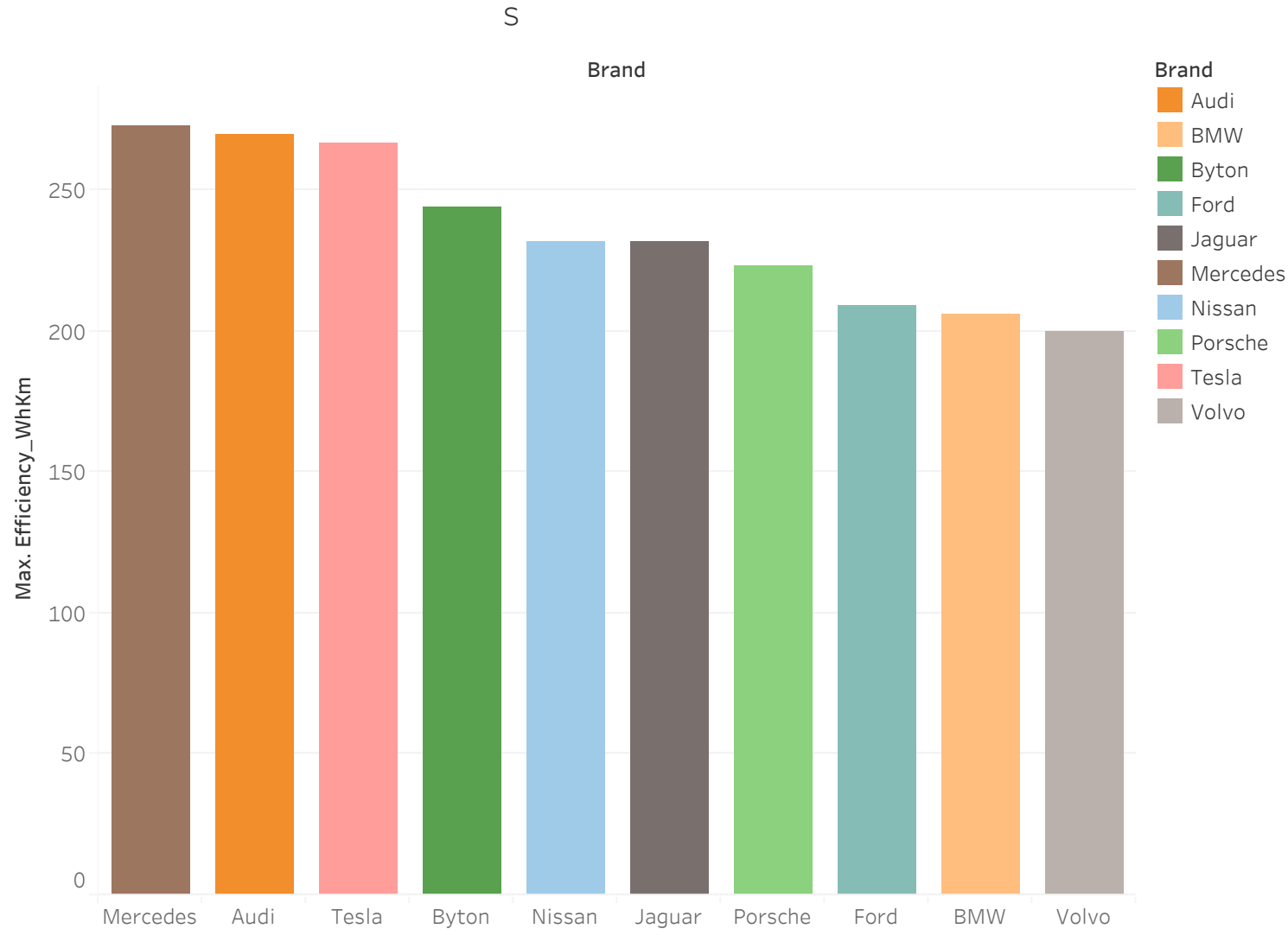
Price for different cars in india

a



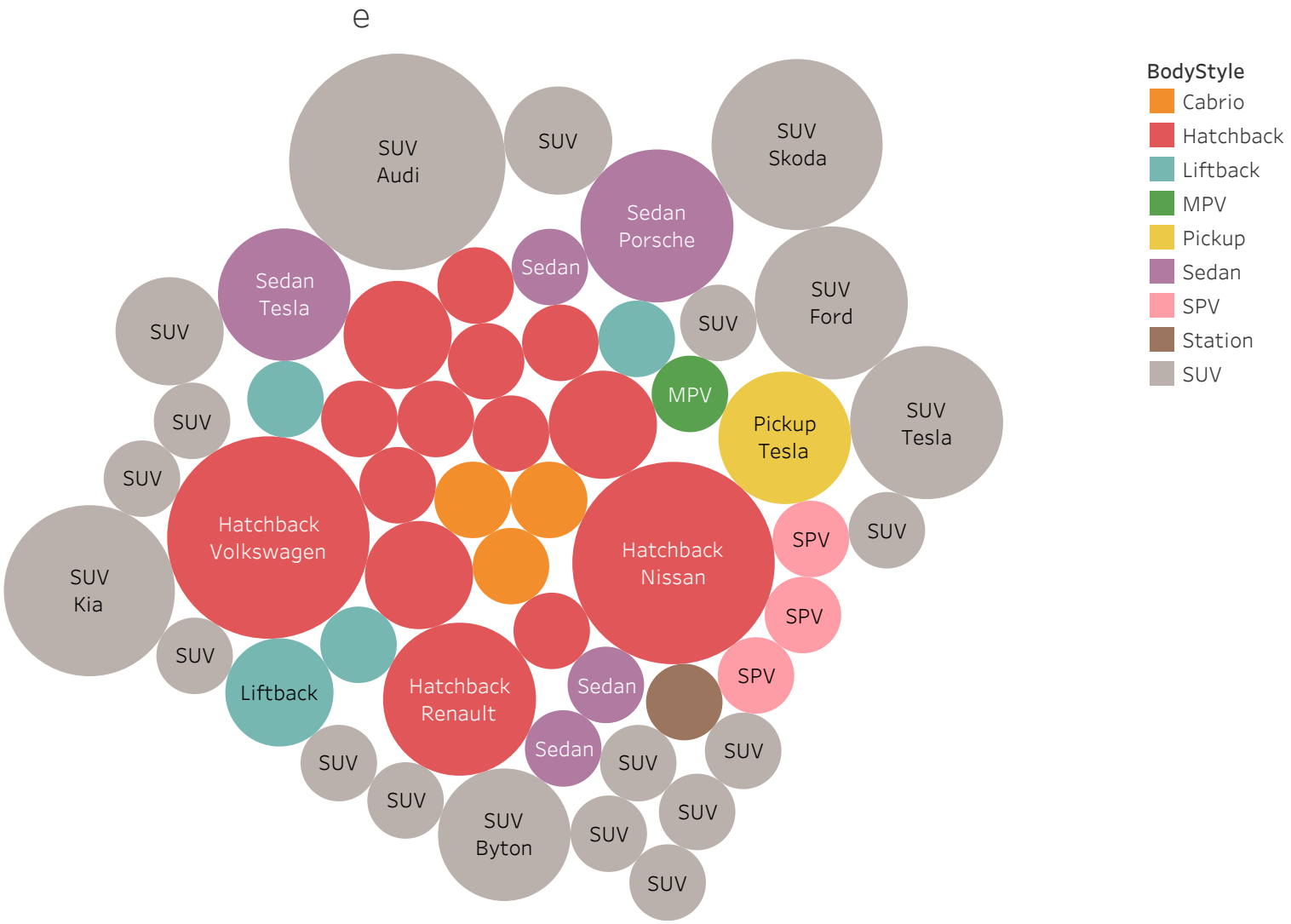
Sum of PriceRange(Lakhs) for each Car. Color shows details about Car.

Price for different cars in india



Maximum of Efficiency_WhKm for each Brand. Color shows details about Brand. The view is filtered on Brand, which keeps 10 of 34 members.

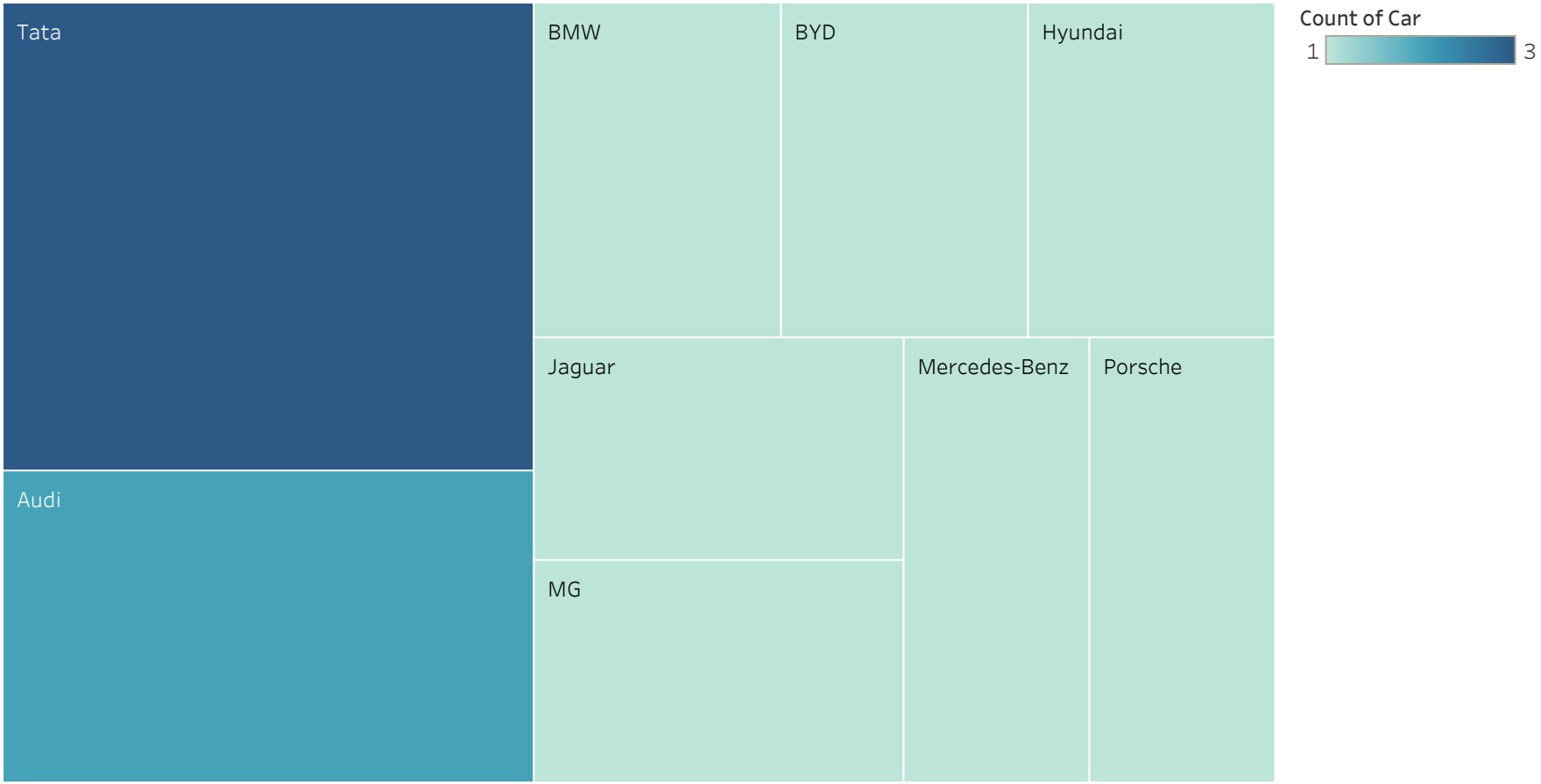
Price for different cars in india



BodyStyle and Brand. Color shows details about BodyStyle. Size shows bodystyle_count. The marks are labeled by BodyStyle and Brand. The view is filtered on BodyStyle, which excludes Null.

Price for different cars inindia

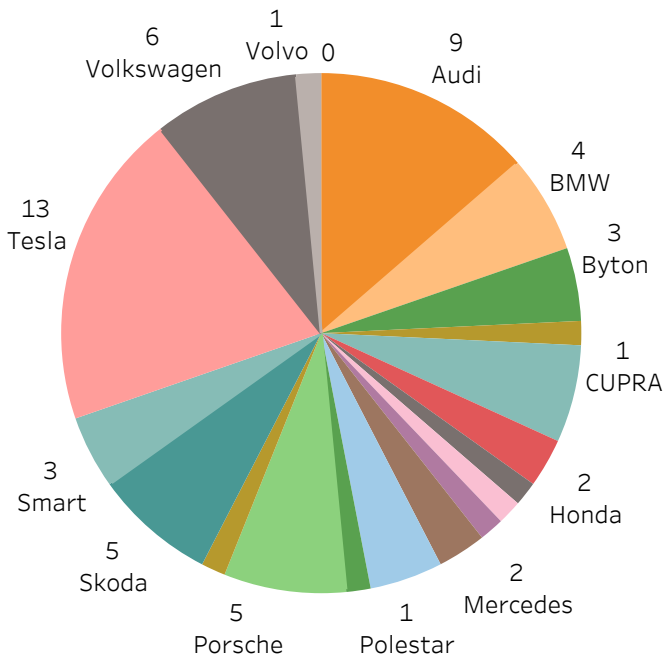
e



Car_brands_india. Color shows count of Car. Size shows count of Car. The marks are labeled by car_brands_india.

Price for different cars in india

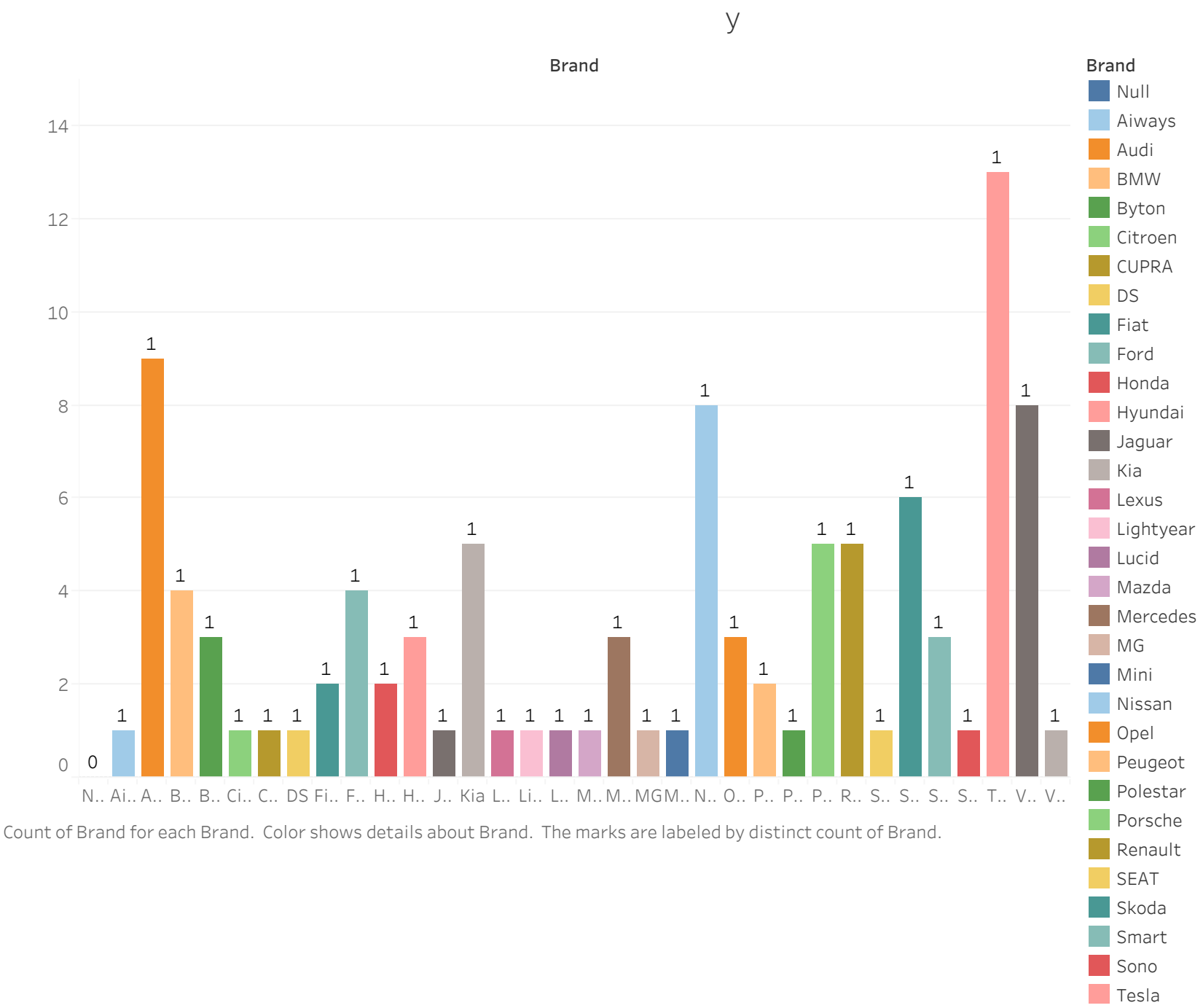
d



Brand
- Null
- Audi
- BMW
- Byton
- CUPRA
- Ford
- Honda
- Jaguar
- Lightyear
- Lucid
- Mercedes
- Nissan
- Polestar
- Porsche
- Renault
- Skoda
- Smart
- Tesla
- Volkswagen
- Volvo

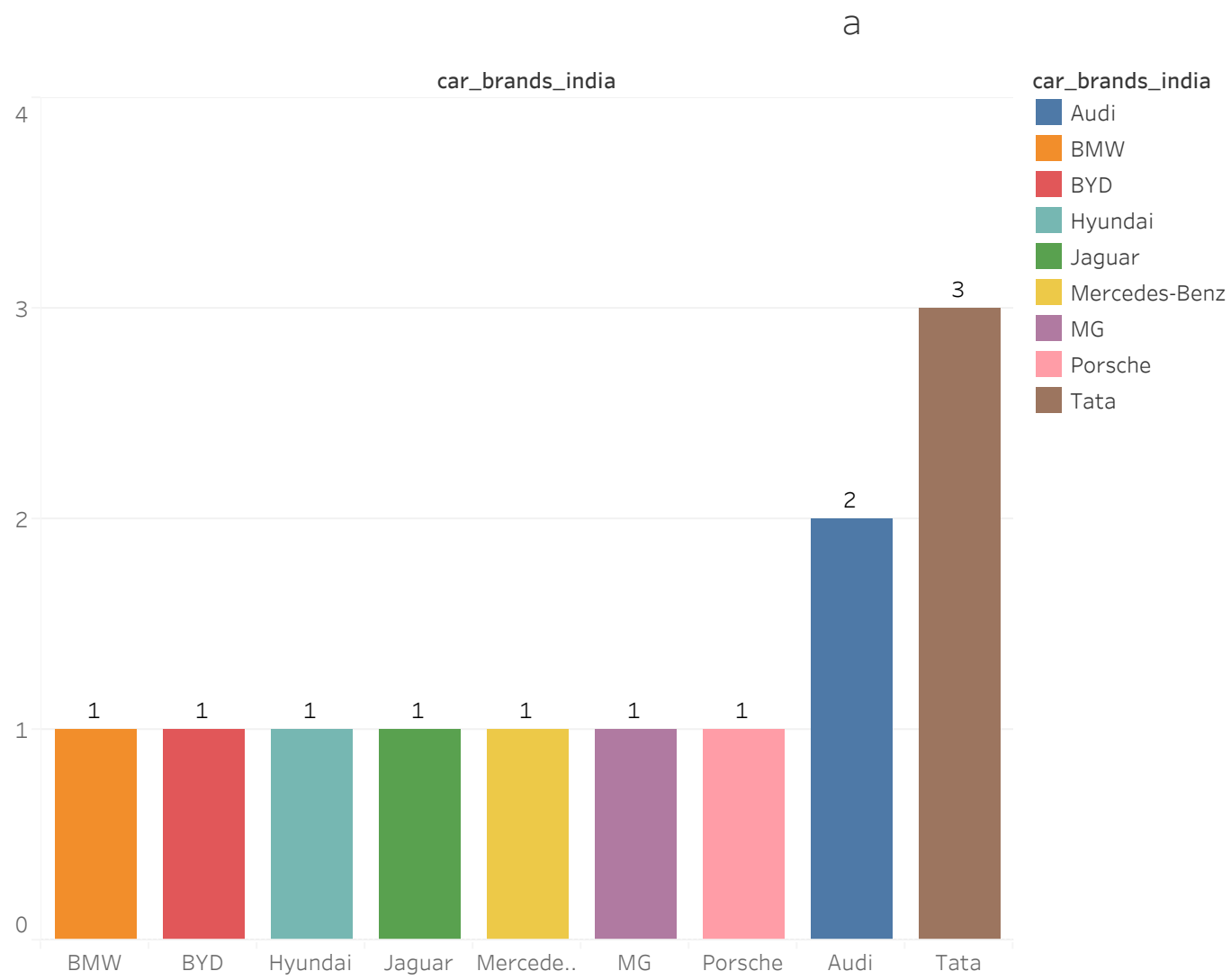
Count_powertrain and Brand. Color shows details about Brand. The marks are labeled by count_powertrain and Brand. The data is filtered on PowerTrain, which keeps Null, AWD and RWD.

Price for different cars in india



Count of Brand for each Brand. Color shows details about Brand. The marks are labeled by distinct count of Brand.

Price for different cars inindia



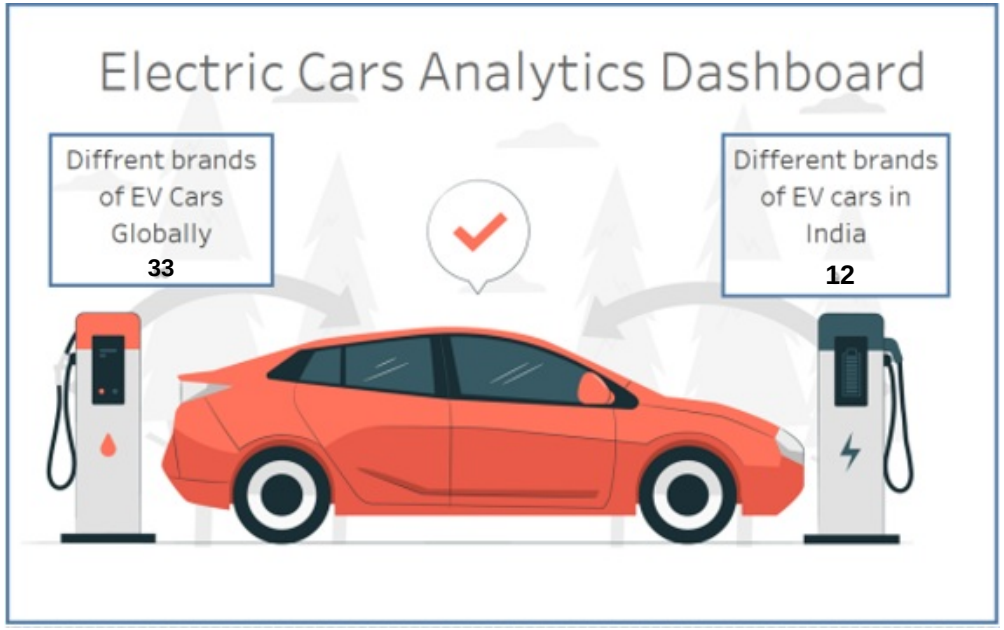
Count of car_brands_india for each car_brands_india. Color shows details about car_brands_india.
The marks are labeled by count of car_brands_india.

DASHBOARD

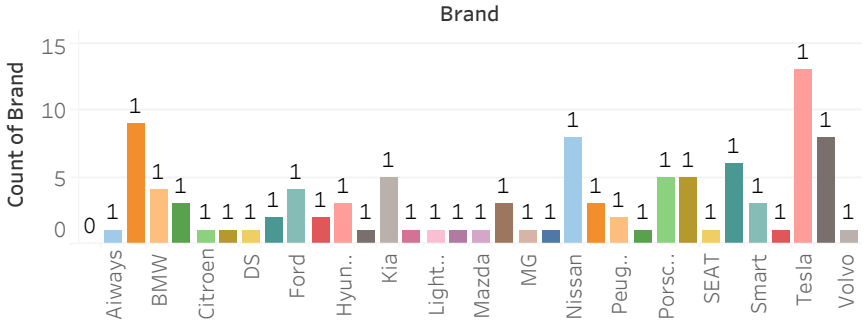
A dashboard is a graphical user interface (GUI) that displays information and data in an organized, easy-to-read format. Dashboards are often used to provide real-time monitoring and analysis of data, and are typically designed for a specific purpose or use case. Dashboards can be used in a variety of settings, such as business, finance, manufacturing, healthcare, and many other industries. They can be used to track key performance indicators (KPIs), monitor performance metrics, and display data in the form of charts, graphs, and tables.

Activity :1- Responsive and Design of Dashboard

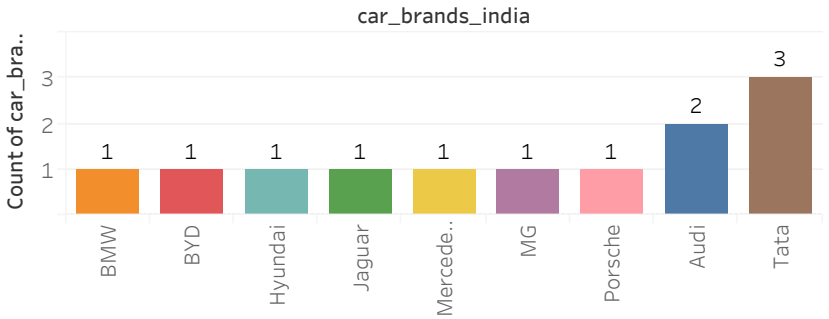
Once you have created views on different sheets in Tableau, you can pull them into a dashboard.



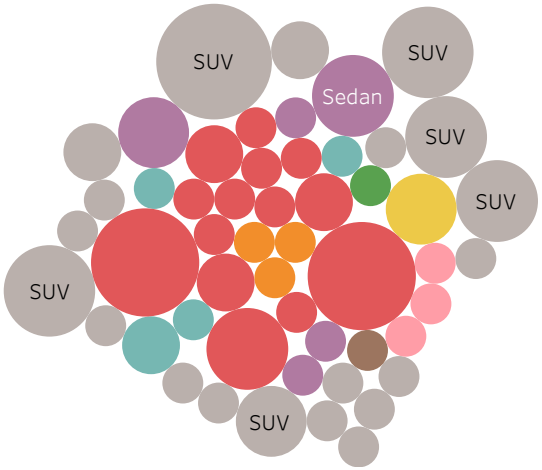
summary card for different brands of EV cars globally



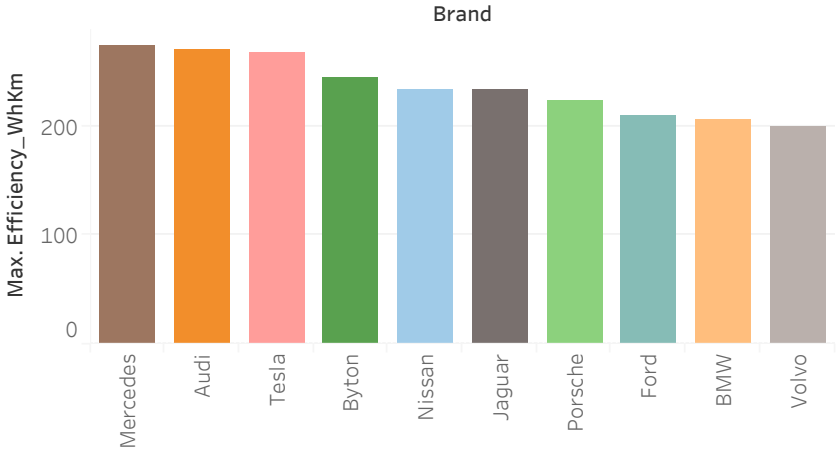
Summary card for different brands of EV cars in india



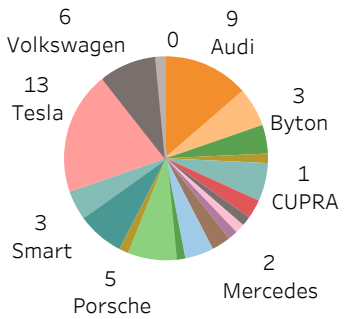
Brands according to bodystyle



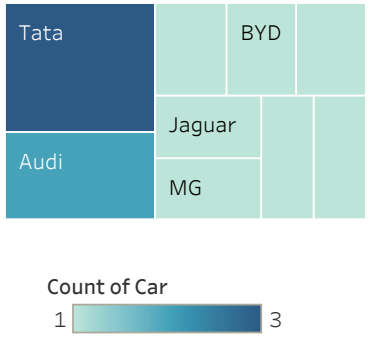
Top 10 most efficient EV brands



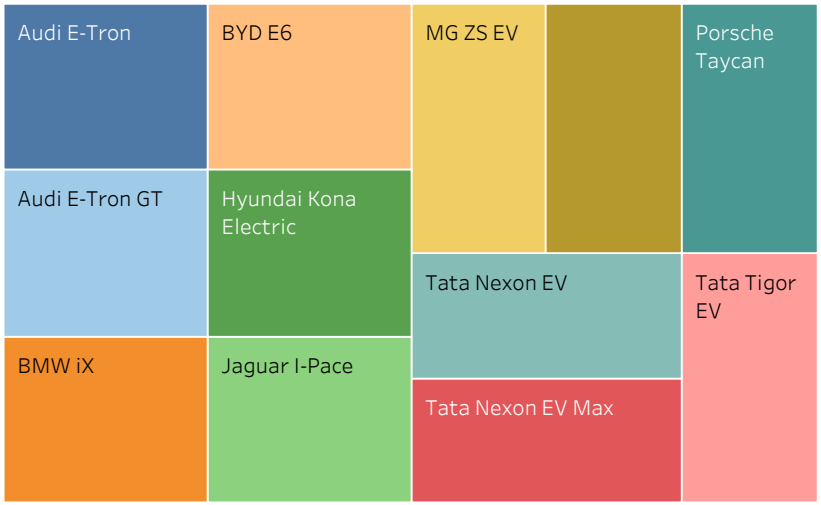
No of models by each brand



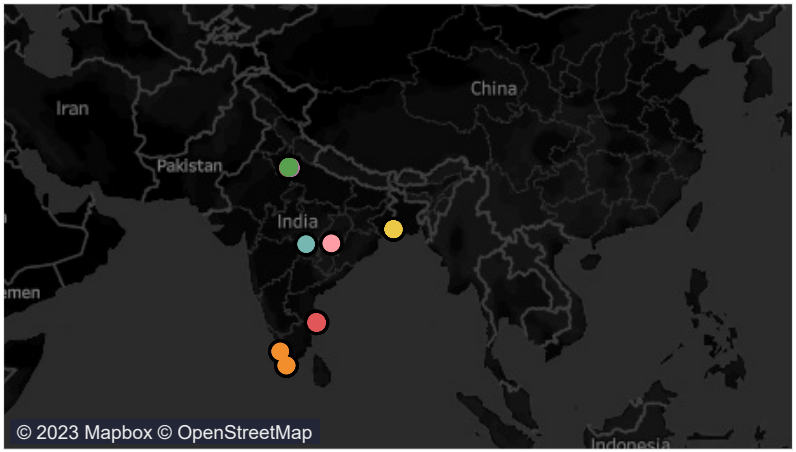
Brand filtered by powertrain type



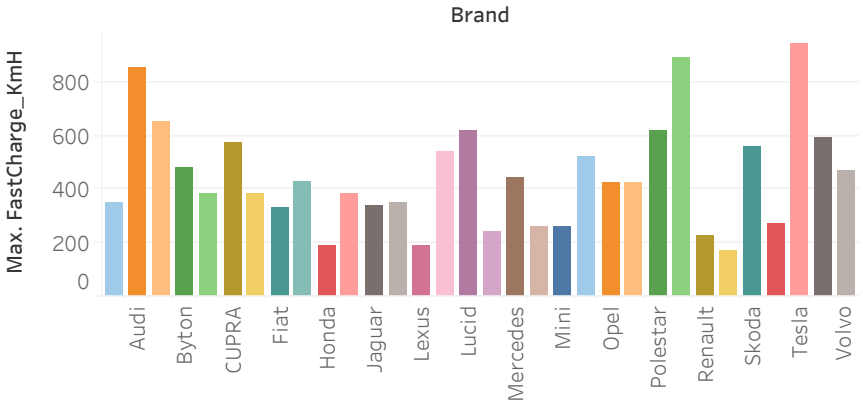
Different EV cars in india



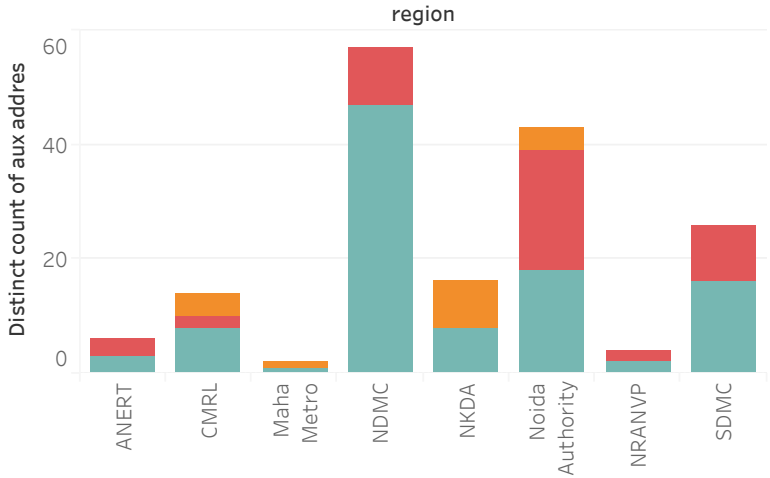
EV charging stations map of india



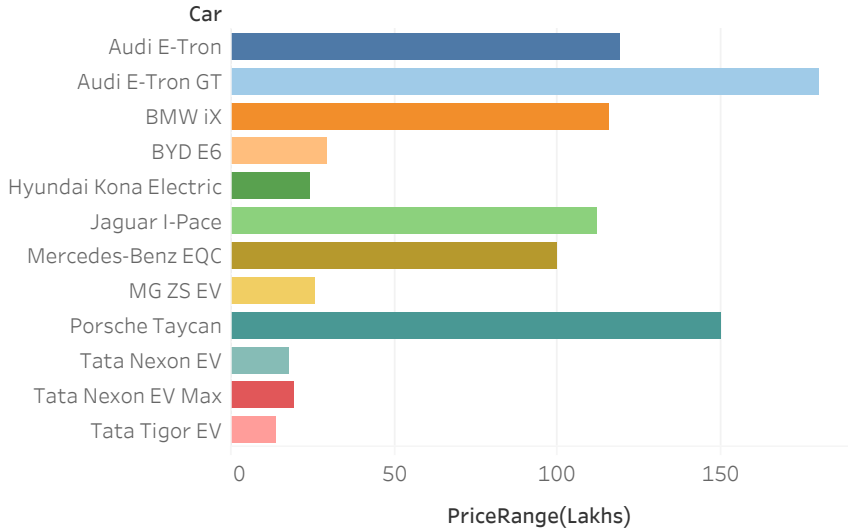
Top speed for different brands



Charging stations by region and type in india



Price for different cars in india



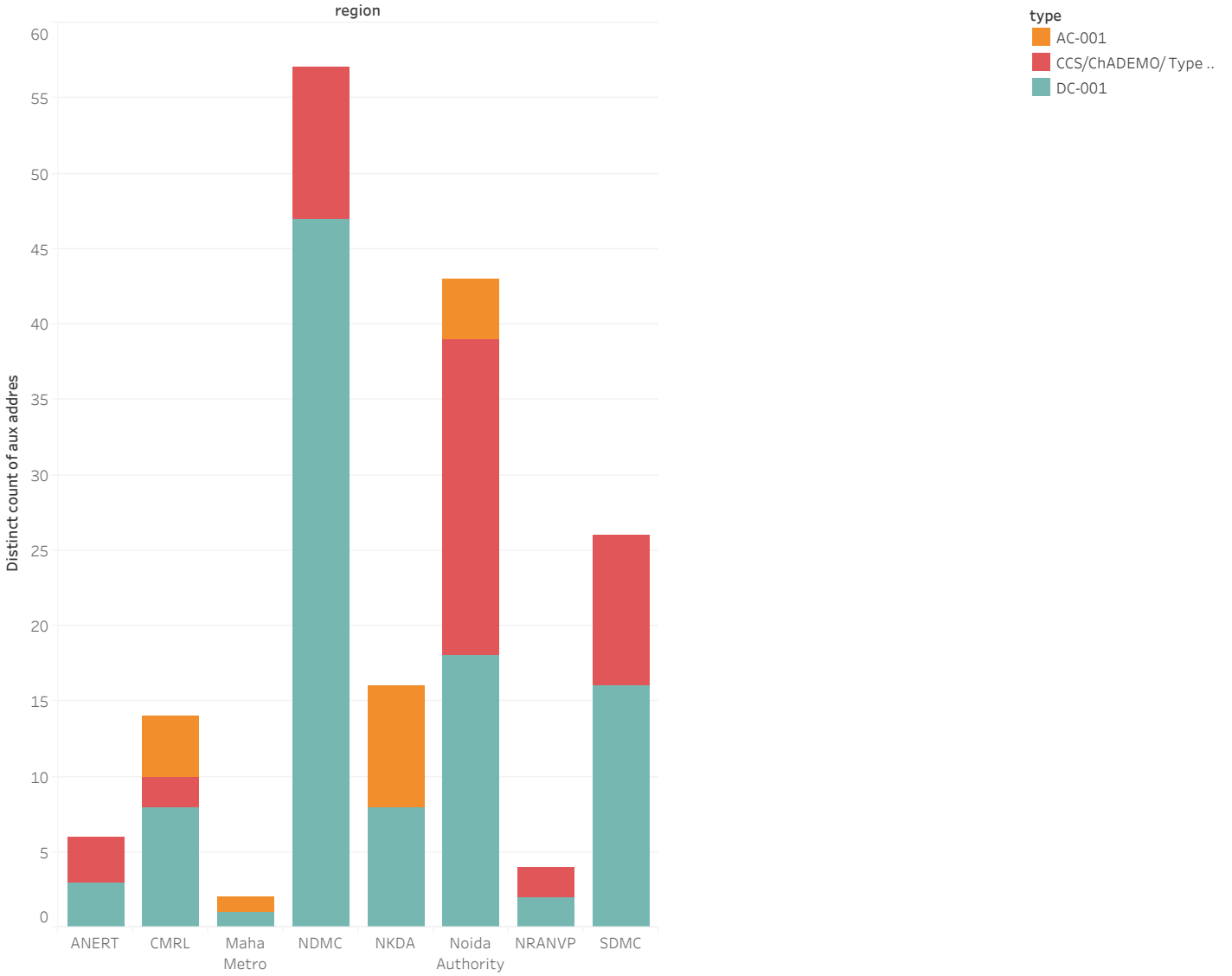
Story

A data story is a way of presenting data and analysis in a narrative format, with the goal of making the information more engaging and easier to understand. A data story typically includes a clear introduction that sets the stage and explains the context for the data, a body that presents the data and analysis in a logical and systematic way, and a conclusion that summarizes the key findings and highlights their implications. Data stories can be told using a variety of mediums, such as reports, presentations, interactive visualizations, and videos.

Activity:1- No of Scenes of Story

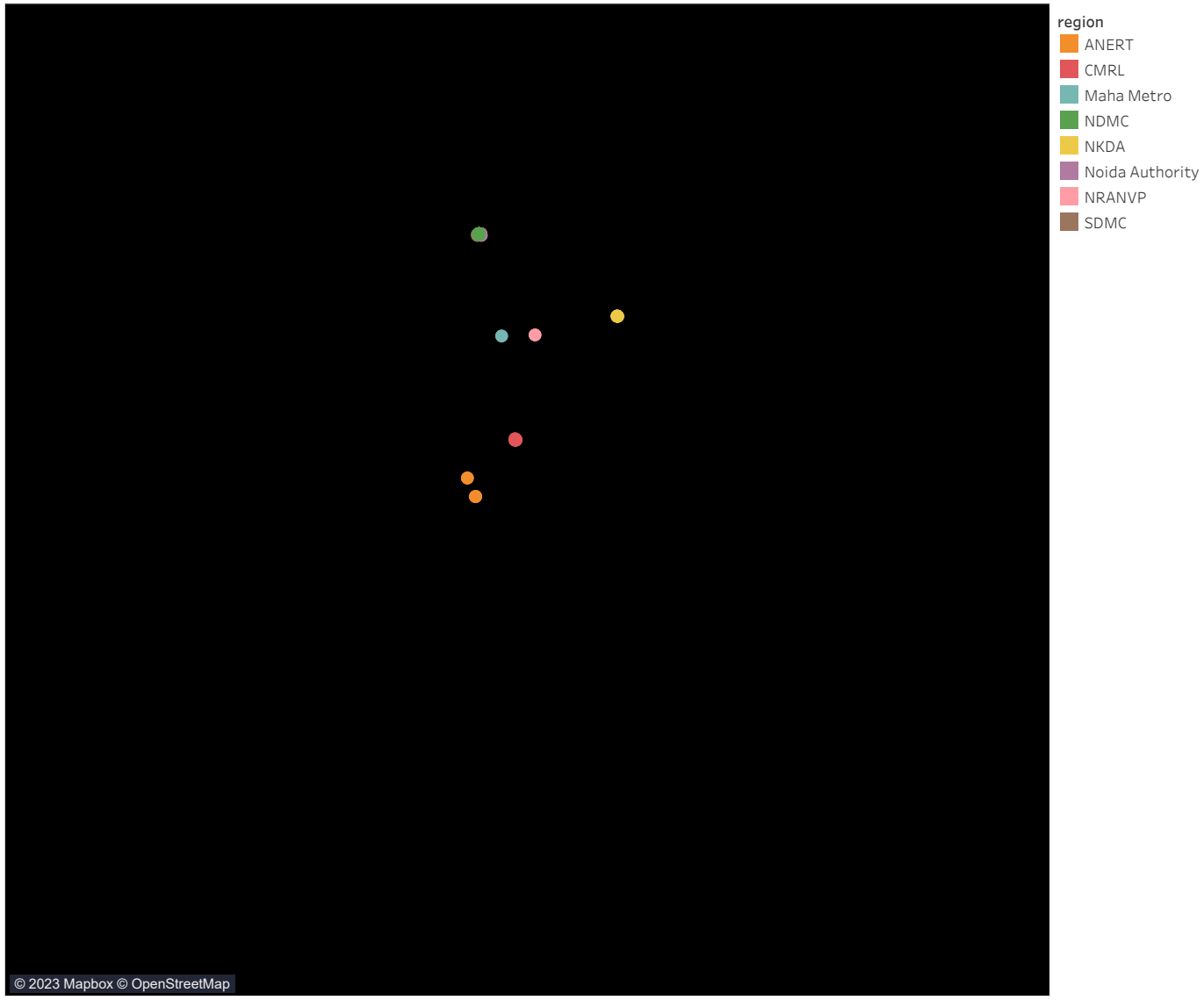
story

Colours according to the type. the highest of NDMC.Type are three types are AC-001,CCS.DC-001	Different charging station in india.many charge station avaliable in delhi	Different EV cars in india include boot space,car,range,style,price range in analysis	top speed for diferent brands the most powerful fast charge are tesla the least fast charge are honda



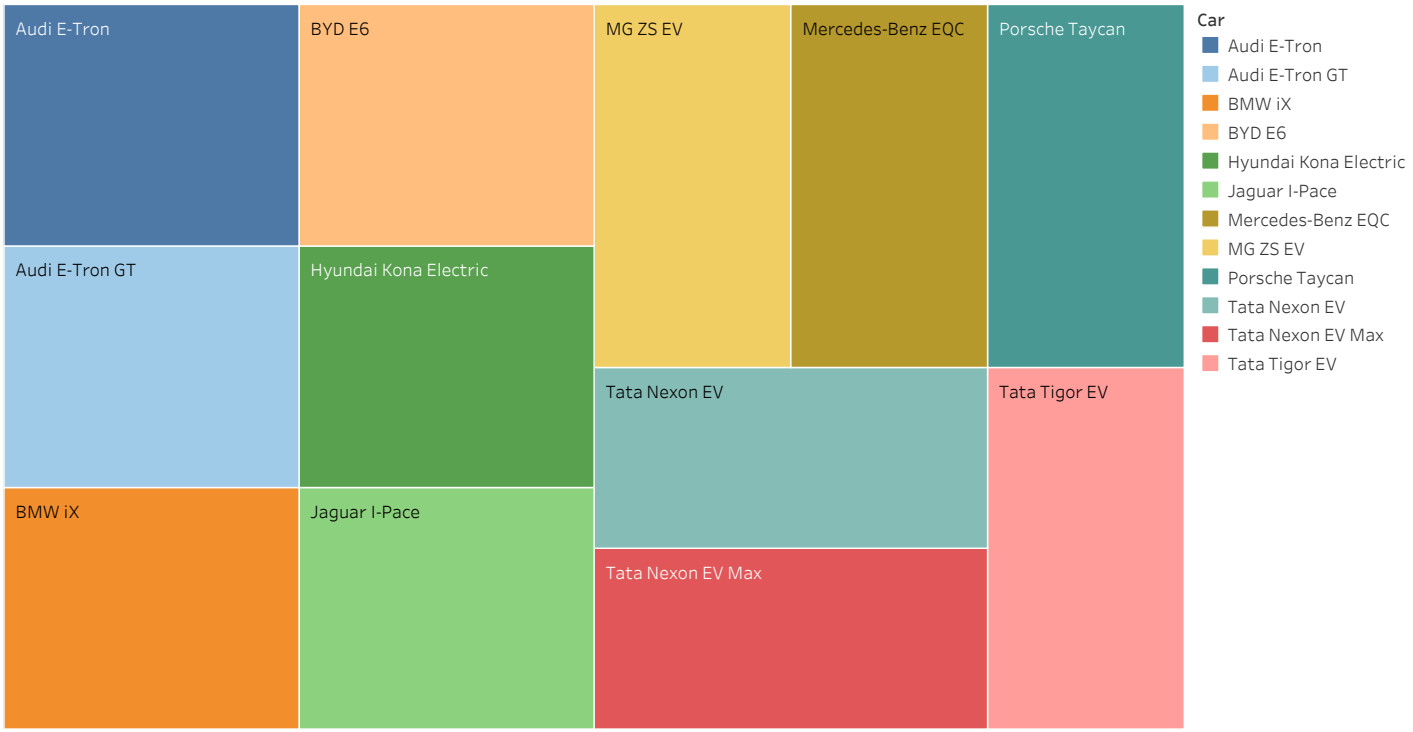
story

Colours according to the type. the highest of NDMC.Type are three types are AC-001,CCS.DC-001	Different charging station in india.many charge station avaliable in delhi	Different EV cars in india include boot space,car,range,style,price range in analysis	top speed for diferent brands the most powerful fast charge are tesla the least fast charge are honda



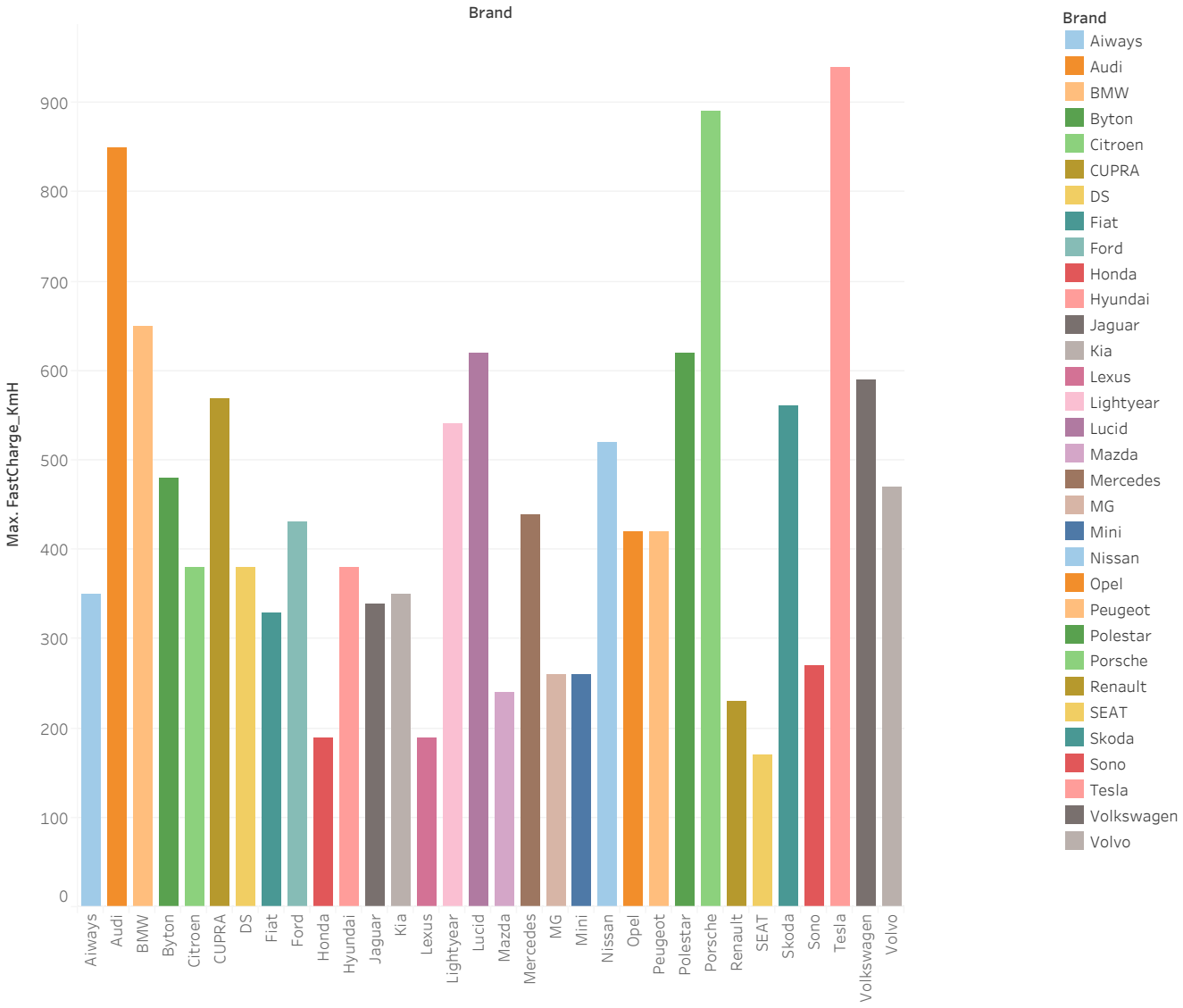
story

Colours according to the type. the highes..	Different charging station in india.many charge station avaliable in delhi	Different EV cars in india include boot space,car,range,style,price range in analysis	top speed for diferent brands the most powerful fast charge are tesla the least fast charge are honda	price for different cars in india the most expensi..



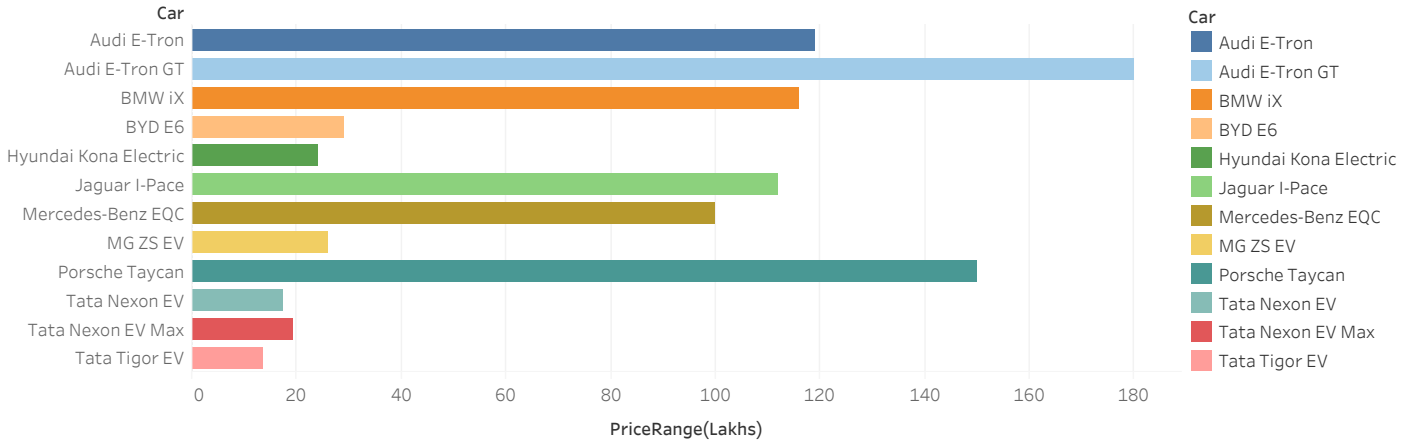
story

Different charging station in india.many..	Different EV cars in india include boot space,car,range,style,price range in analysis	top speed for diferent brands the most powerful fast charge are tesla the least fast charge are honda	price for different cars in india the most expensive cars are audi E-Tron is a costly cars in india the cheapest cars are tata tigor EV	shows that top 10 most effficient EV Brandsthe fir..



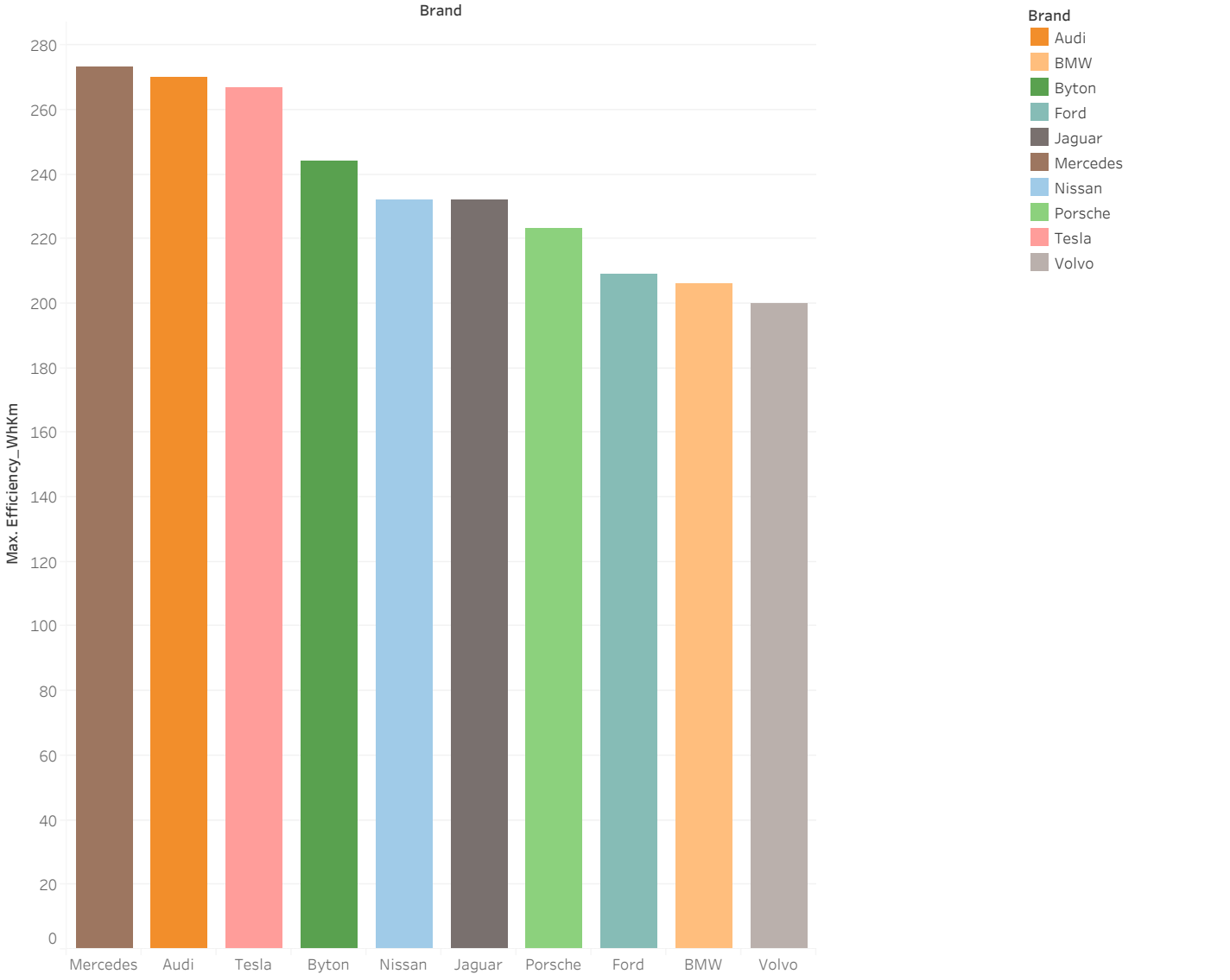
story

Different EV cars in india include boot space,car,r..	top speed for diferent brands the most powerful fast charge are tesla the least fast charge are honda	price for different cars in india the most expensive cars are audi E-Tron is a costly cars in india the cheapest cars are tata tigor EV	shows that top 10 most effficient EV Brandsthe first place for mercedes and the last place for volvo	shows that bubble maps bodystyle is requried diffe..



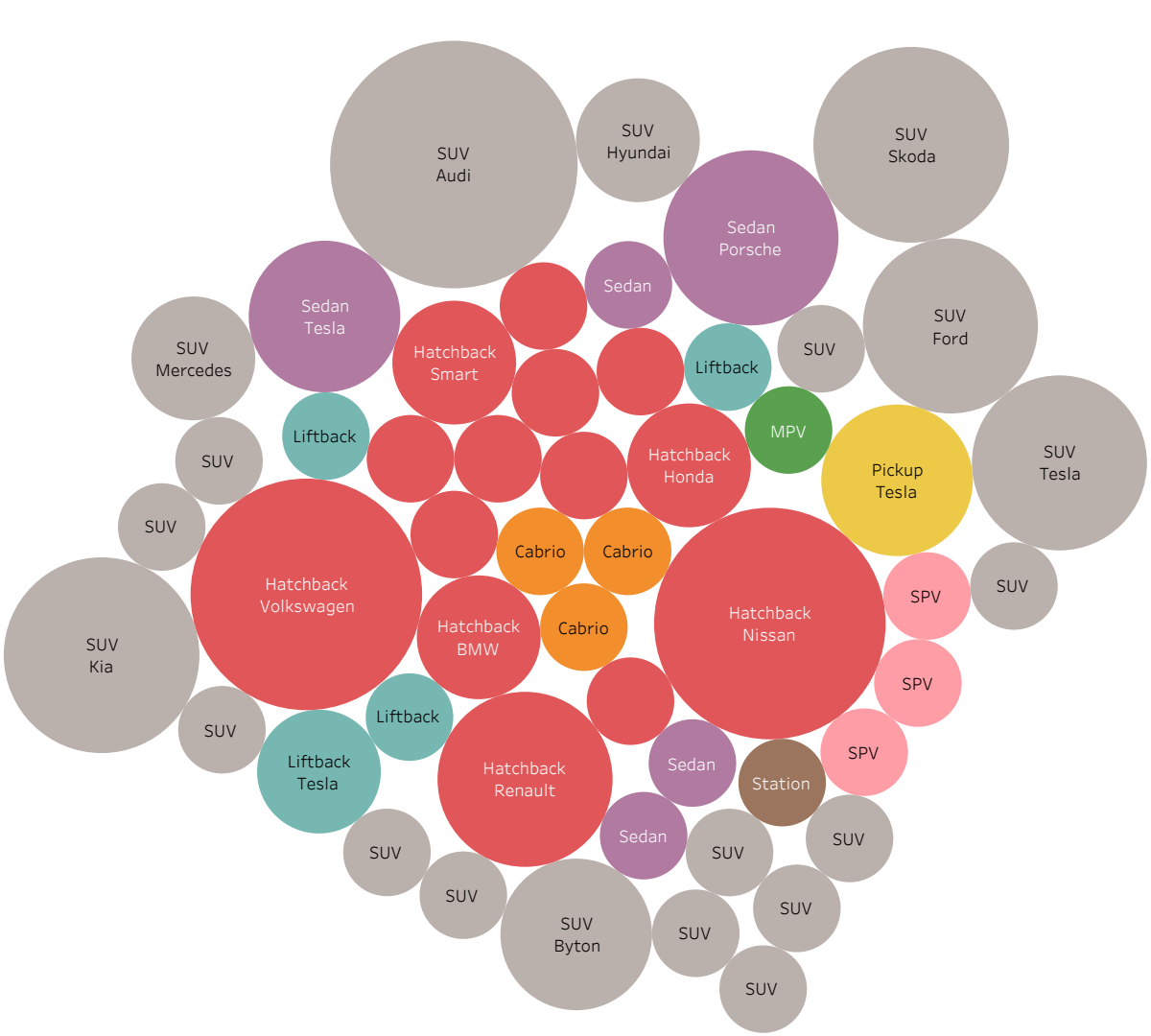
story

top speed for diferent brands the most powe..	price for different cars in india the most expensive cars are audi E-Tron is a costly cars in india the cheapest cars are tata tigor EV	shows that top 10 most effficient EV Brandsthe first place for mercedes and the last place for volvo	shows that bubble maps bodystyle is requried different brands are same bodystles are majorly hatchback	count of cars only three types for different bran..



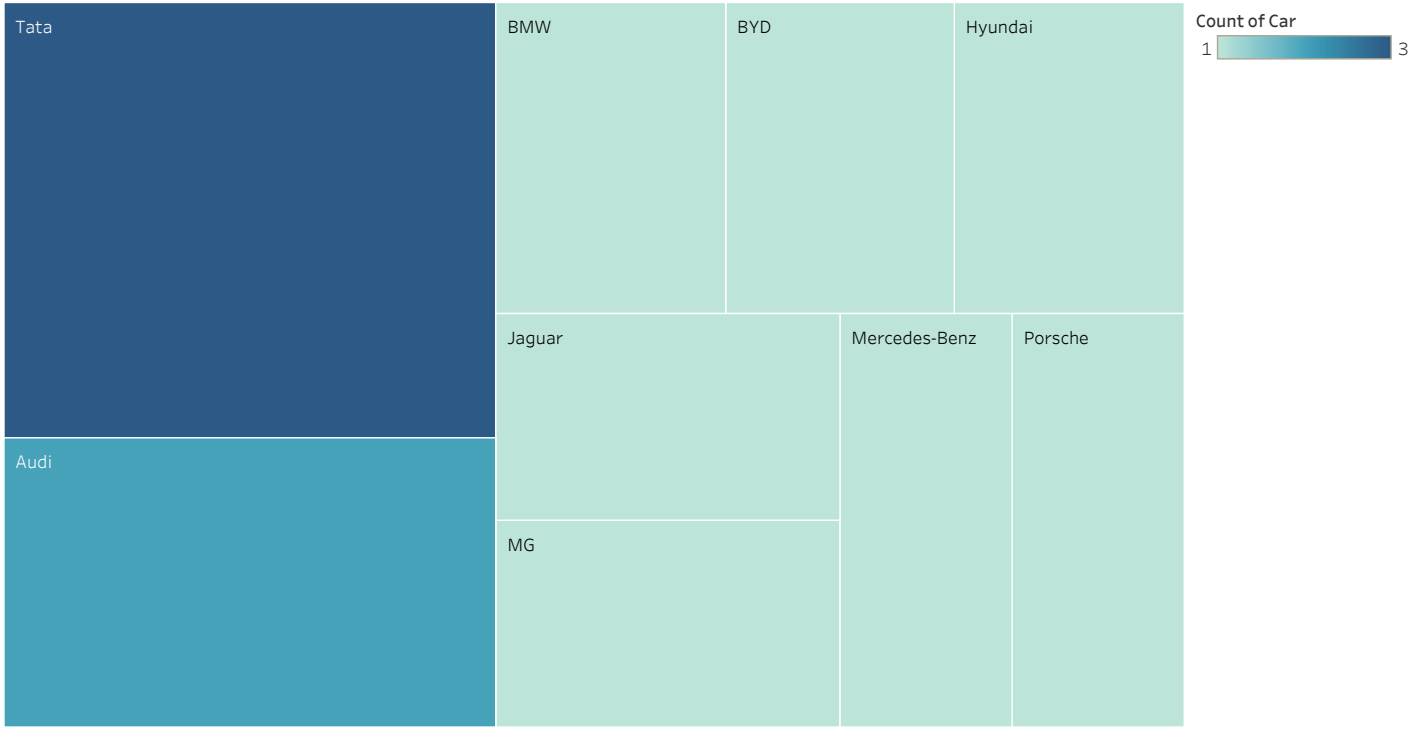
story

price for different cars in india the most e..	shows that top 10 most effficient EV Brandsthe first place for mercedes and the last place for volvo	shows that bubble maps bodystyle is requried different brands are same bodystles are majorly hatchback	count of cars only three types for different brands tata and audi are unique	pie chart shows no of models for each brands t..



story

shows that top 10 most effficient EV Brandsthe ..	shows that bubble maps bodystyle is requried different brands are same bodystles are majorly hatchback	count of cars only three types for different brands tata and audi are unique	pie chart shows no of models for each brands tesla was 13 models is avaliable and audi was 9 powertrains	summary card for different brands of EV cars globally ..



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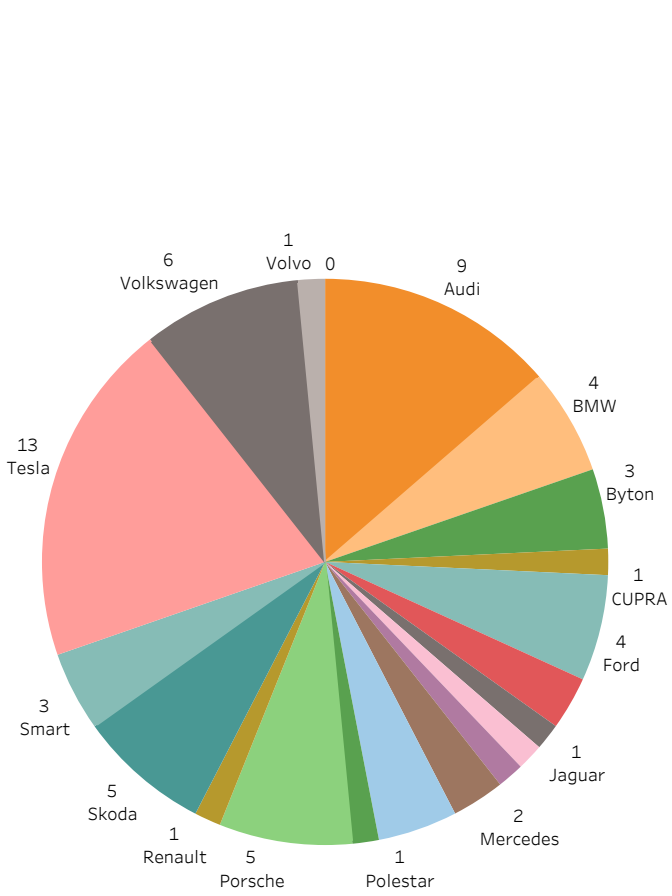

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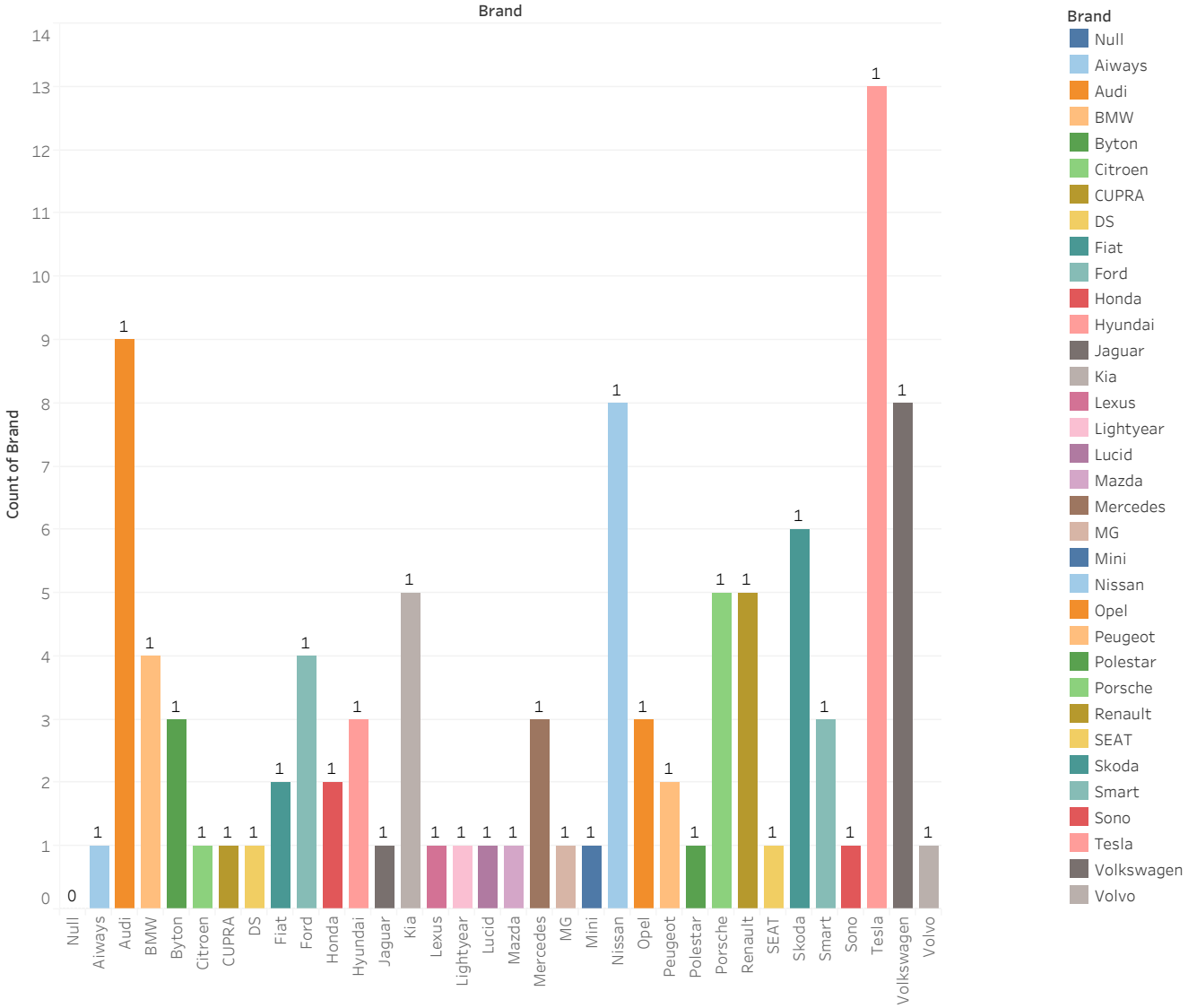

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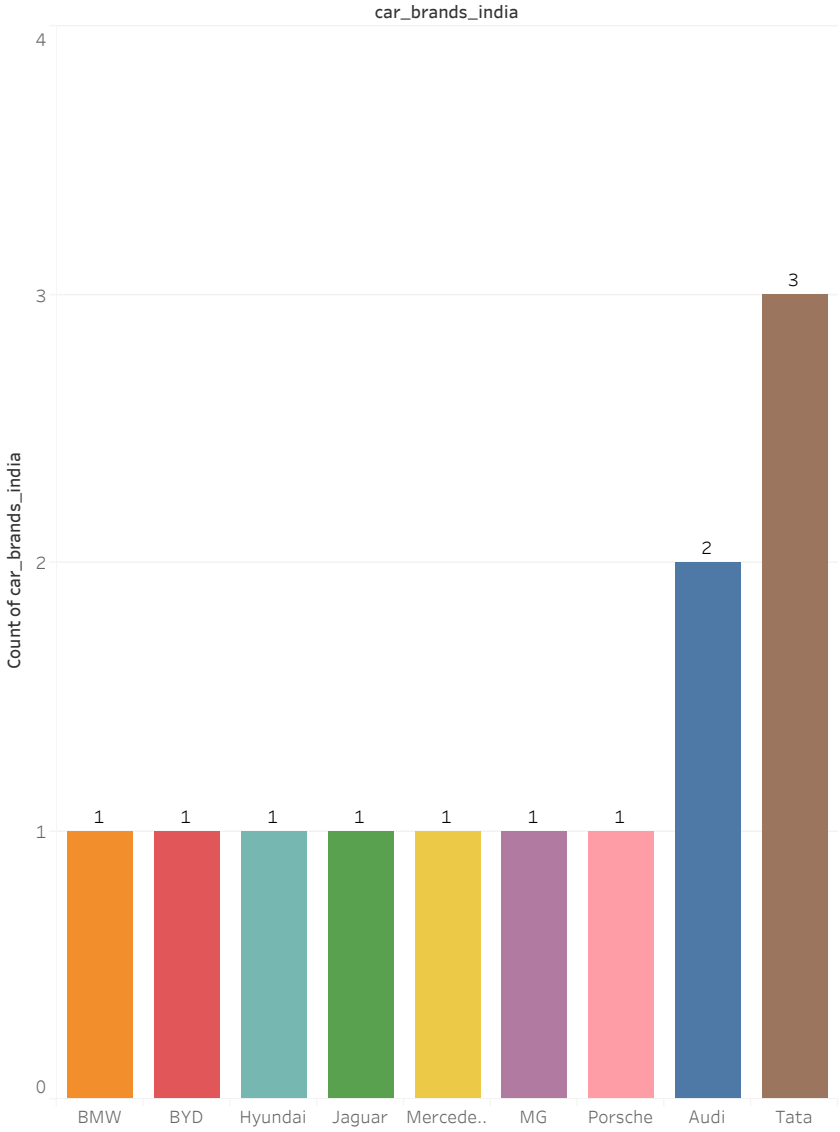

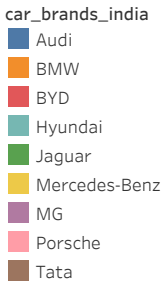

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ADVANTAGES

* No fuel required so you save money on gas
* Environmental friendly as they do not emit pollutants
* lower maintenance due to an efficient electric motor
* Better performance

DISADVANTAGES

* Battery lifespan concerns
* Charging infrastructure worries
* Long charging times
* Low top speeds

APPLICATION

* Consumer electronics
* Public transport
* renewable enery storage
* wearable technology

FUTURE SCOPE

Most indian buyers believe that an electric vehicle will be ready by 2023, but the majority also believe that it would no longer be avaliable until 2025

CONCLUSION

The basic conclusion is that when it comes to climate change and air quality electric cars are clearly preferable to petrol or disel cars