

Out[59]:

Sr. No.		Train Name	Train Number	Originating City	Originating Station	Terminal City	Terminal Station	Operator	No. of Cars	Frequency
0	1	New Delhi - Varanasi Vande Bharat Express	22435/22436	Delhi	New Delhi	Varanasi	Varanasi Junction	NR	16	Except Thursdays
1	2	New Delhi - Shri Mata Vaishno Devi Katra Vande Bharat Express	22439/22440	Delhi	New Delhi	Katra	Shri Mata Vaishno Devi Katra	NR	16	Except Tuesdays
2	3	Mumbai Central - Gandhinagar Capital Vande Bharat Express	20901/20902	Mumbai	Mumbai Central	Gandhinagar	Gandhinagar Capital	WR	16	Except Wednesdays
3	4	New Delhi - Amb Andaura Vande Bharat Express	22447/22448	Delhi	New Delhi	Andaura	Amb Andaura	NR	16	Except Fridays
4	5	MGR Chennai Central - Mysuru Vande Bharat Express	20607/20608	Chennai	Chennai Central	Mysuru	Mysore Junction	SR	16	Except Wednesdays
5	6	Bilaspur - Nagpur Vande Bharat Express	20825/20826	Bilaspur, Chhattisgarh	Bilaspur Junction	Nagpur	Nagpur Junction	SECR	8	Except Saturdays
6	7	Howrah - New Jalpaiguri Vande Bharat Express	22301/22302	Kolkata	Howrah Junction	Siliguri	New Jalpaiguri Junction	ER	16	Except Wednesdays
7	8	Visakhapatnam - Secunderabad Vande Bharat Express	20833/20834	Visakhapatnam	Visakhapatnam Junction	Hyderabad	Secunderabad Junction	ECOR	16	Except Sundays
8	9	Mumbai CSMT - Solapur Vande Bharat Express	22225/22226	Mumbai	Chhatrapati Shivaji Terminus	Solapur	Solapur	CR	16	Except Wednesdays (22225) , Except Thursdays (22226)
9	10	Mumbai CSMT - Sainagar Shirdi Vande Bharat Express	22223/22224	Mumbai	Chhatrapati Shivaji Terminus	Shirdi	Sainagar Shirdi	CR	16	Except Tuesdays
10	11	Rani Kamalapati (Habibganj) - Hazrat Nizamuddin Vande Bharat Express	20171/20172	Bhopal	Habibganj (Rani Kamalapati)	Delhi	Hazrat Nizamuddin	WCR	16	Except Saturdays
11	12	Secunderabad - Tirupati Vande Bharat Express	20701/20702	Hyderabad	Secunderabad Junction	Tirupati	Tirupati	SCR	16	Except Tuesdays
12	13	MGR Chennai Central - Coimbatore Vande Bharat Express	20643/20644	Chennai	Chennai Central	Coimbatore	Coimbatore Junction	SR	8	Except Wednesdays
13	14	Delhi Cantonment - Ajmer Vande Bharat Express	20977/20978	Delhi	Delhi Cantonment	Ajmer	Ajmer Junction	NWR	16	Except Wednesdays
14	15	Kasaragod - Thiruvananthapuram Vande Bharat Express	20633/20634	Kasaragod	Kasaragod	Thiruvananthapuram	Thiruvananthapuram Central	SR	16	Except Thursdays
15	16	Howrah - Puri Vande Bharat Express	22895/22896	Kolkata	Howrah Junction	Puri	Puri	SER	16	Except Thursdays
16	17	Anand Vihar Terminal - Dehradun Vande Bharat Express	22457/22458	Delhi	Anand Vihar Terminal	Dehradun	Dehradun Terminal	NR	8	Except Wednesdays
17	18	New Jalpaiguri - Guwahati Vande Bharat Express	22227/22228	Siliguri	New Jalpaiguri Junction	Guwahati	Guwahati	NFR	8	Except Tuesdays
18	19	Mumbai CSMT - Madgaon Vande Bharat Express	22229/22230	Mumbai	Chhatrapati Shivaji Terminus	Madgaon	Madgaon Junction	CR	16	Except Fridays\n\nMondays
19	19	Mumbai CSMT - Madgaon Vande Bharat Express	22229/22230	Mumbai	Chhatrapati Shivaji Terminus	Madgaon	Madgaon Junction	CR	16	Monday\n\nWednesday\n\nFriday (22229)\n\nTuesday (22230)
Patna - Ranchi										

20	20	Vande Bharat Express	22349/22350	Patna	Patna Junction	Ranchi	Ranchi Junction	ECR	8	Except Tues
21	21	KSR Bengaluru - Dharwad Vande Bharat Express	20661/20662	Bangalore	Bangalore City	Hubbali - Dharwad	Dharwad	SWR	8	Except Tues
22	22	Rani Kamalapati (Habibganj) - Jabalpur Vande B...	20173/20174	Bhopal	Habibganj (Rani Kamalapati)	Jabalpur	Jabalpur Junction	WCR	8	Except Tues
23	23	Indore - Bhopal Vande Bharat Express	20911/20912	Indore	Indore Junction	Bhopal	Bhopal Junction	WR	8	Except Sur
24	24	Jodhpur - Sabarmati (Ahmedabad) Vande Bharat E...	12461/12462	Jodhpur	Jodhpur Junction	Ahmedabad	Sabarmati Junction	NWR	8	Except Tues
25	25	Gorakhpur - Lucknow Charbagh Vande Bharat Express	22549/22550	Gorakhpur	Gorakhpur Junction	Charbagh	Lucknow Charbagh	NER	8	Except Satu

Data Cleaning & Manipulation

In [60]: `df.columns`

Out[60]: Index(['Sr. No.', 'Train Name', 'Train Number', 'Originating City', 'Originating Station', 'Terminal City', 'Terminal Station', 'Operator', 'No. of Cars', 'Frequency', 'Distance', 'Travel Time', 'Speed', 'Average Speed', 'Inauguration', 'Average occupancy'], dtype='object')

In [61]: `df.shape`

Out[61]: (26, 16)

In [62]: `df.info()`

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 26 entries, 0 to 25
Data columns (total 16 columns):
#   Column                Non-Null Count  Dtype
---  -
0   Sr. No.                26 non-null    int64
1   Train Name             26 non-null    object
2   Train Number           26 non-null    object
3   Originating City       26 non-null    object
4   Originating Station    26 non-null    object
5   Terminal City          26 non-null    object
6   Terminal Station       26 non-null    object
7   Operator               26 non-null    object
8   No. of Cars            26 non-null    int64
9   Frequency              26 non-null    object
10  Distance               26 non-null    object
11  Travel Time            26 non-null    object
12  Speed                  26 non-null    object
13  Average Speed          26 non-null    object
14  Inauguration           26 non-null    object
15  Average occupancy      26 non-null    object
dtypes: int64(2), object(14)
memory usage: 3.4+ KB
```

In [63]: `df.duplicated().sum()`

Out[63]: 0

In [64]: `df.isna()`

Out[64]:

	Sr. No.	Train Name	Train Number	Originating City	Originating Station	Terminal City	Terminal Station	Operator	No. of Cars	Frequency	Distance	Travel Time	Speed	Average Speed	Inaug
0	False	False	False	False	False	False	False	False	False	False	False	False	False	False	
1	False	False	False	False	False	False	False	False	False	False	False	False	False	False	
2	False	False	False	False	False	False	False	False	False	False	False	False	False	False	
3	False	False	False	False	False	False	False	False	False	False	False	False	False	False	
4	False	False	False	False	False	False	False	False	False	False	False	False	False	False	
5	False	False	False	False	False	False	False	False	False	False	False	False	False	False	
6	False	False	False	False	False	False	False	False	False	False	False	False	False	False	
7	False	False	False	False	False	False	False	False	False	False	False	False	False	False	
8	False	False	False	False	False	False	False	False	False	False	False	False	False	False	
9	False	False	False	False	False	False	False	False	False	False	False	False	False	False	
10	False	False	False	False	False	False	False	False	False	False	False	False	False	False	
11	False	False	False	False	False	False	False	False	False	False	False	False	False	False	
12	False	False	False	False	False	False	False	False	False	False	False	False	False	False	
13	False	False	False	False	False	False	False	False	False	False	False	False	False	False	
14	False	False	False	False	False	False	False	False	False	False	False	False	False	False	
15	False	False	False	False	False	False	False	False	False	False	False	False	False	False	
16	False	False	False	False	False	False	False	False	False	False	False	False	False	False	
17	False	False	False	False	False	False	False	False	False	False	False	False	False	False	
18	False	False	False	False	False	False	False	False	False	False	False	False	False	False	
19	False	False	False	False	False	False	False	False	False	False	False	False	False	False	
20	False	False	False	False	False	False	False	False	False	False	False	False	False	False	
21	False	False	False	False	False	False	False	False	False	False	False	False	False	False	
22	False	False	False	False	False	False	False	False	False	False	False	False	False	False	
23	False	False	False	False	False	False	False	False	False	False	False	False	False	False	
24	False	False	False	False	False	False	False	False	False	False	False	False	False	False	
25	False	False	False	False	False	False	False	False	False	False	False	False	False	False	

In [65]: df.isna().sum()

Out[65]:

Sr. No.	0
Train Name	0
Train Number	0
Originating City	0
Originating Station	0
Terminal City	0
Terminal Station	0
Operator	0
No. of Cars	0
Frequency	0
Distance	0
Travel Time	0
Speed	0
Average Speed	0
Inauguration	0
Average occupancy	0

dtype: int64

In [66]: df.drop('Sr. No.', axis=1, inplace=True)

In [67]: df.nunique()

Out[67]:

Train Name	25
Train Number	25
Originating City	15
Originating Station	18
Terminal City	25
Terminal Station	25
Operator	15
No. of Cars	2
Frequency	9
Distance	24
Travel Time	20
Speed	5
Average Speed	17
Inauguration	18
Average occupancy	22

dtype: int64

```
In [68]: for i in df:
          print(i)
          print('\n')
          print(df[i].value_counts())
          print('-'*100)
```

Train Name

Mumbai CSMT - Madgaon Vande Bharat Express	2
New Delhi - Varanasi Vande Bharat Express	1
Delhi Cantonment - Ajmer Vande Bharat Express	1
Jodhpur - Sabarmati (Ahmedabad) Vande Bharat Express	1
Indore - Bhopal Vande Bharat Express	1
Rani Kamalapati (Habibganj) - Jabalpur Vande Bharat Express	1
KSR Bengaluru - Dharwad Vande Bharat Express	1
Patna - Ranchi Vande Bharat Express	1
New Jalpaiguri - Guwahati Vande Bharat Express	1
Anand Vihar Terminal - Dehradun Vande Bharat Express	1
Howrah - Puri Vande Bharat Express	1
Kasaragod - Thiruvananthapuram Vande Bharat Express	1
MGR Chennai Central - Coimbatore Vande Bharat Express	1
New Delhi - Shri Mata Vaishno Devi Katra Vande Bharat Express	1
Secunderabad - Tirupati Vande Bharat Express	1
Rani Kamalapati (Habibganj) - Hazrat Nizamuddin Vande Bharat Express	1
Mumbai CSMT - Sainagar Shirdi Vande Bharat Express	1
Mumbai CSMT - Solapur Vande Bharat Express	1
Visakhapatnam - Secunderabad Vande Bharat Express	1
Howrah - New Jalpaiguri Vande Bharat Express	1
Bilaspur - Nagpur Vande Bharat Express	1
MGR Chennai Central - Mysuru Vande Bharat Express	1
New Delhi - Amb Andaura Vande Bharat Express	1
Mumbai Central - Gandhinagar Capital Vande Bharat Express	1
Gorakhpur - Lucknow Charbagh Vande Bharat Express	1

Name: Train Name, dtype: int64

Train Number

22229/22230	2
22435/22436	1
20977/20978	1
12461/12462	1
20911/20912	1
20173/20174	1
20661/20662	1
22349/22350	1
22227/22228	1
22457/22458	1
22895/22896	1
20633/20634	1
20643/20644	1
22439/22440	1
20701/20702	1
20171/20172	1
22223/22224	1
22225/22226	1
20833/20834	1
22301/22302	1
20825/20826	1
20607/20608	1
22447/22448	1
20901/20902	1
22549/22550	1

Name: Train Number, dtype: int64

Originating City

Delhi	5
Mumbai	5
Chennai	2
Kolkata	2
Bhopal	2
Bilaspur, Chhattisgarh	1
Visakhapatnam	1
Hyderabad	1
Kasaragod	1
Siliguri	1
Patna	1
Bangalore	1
Indore	1
Jodhpur	1
Gorakhpur	1

Name: Originating City, dtype: int64

Originating Station

Chhatrapati Shivaji Terminus	4
New Delhi	3
Chennai Central	2
Howrah Junction	2
Habibganj (Rani Kamalapati)	2
Anand Vihar Terminal	1
Jodhpur Junction	1
Indore Junction	1
Bangalore City	1
Patna Junction	1
New Jalpaiguri Junction	1
Delhi Cantonment	1
Kasaragod	1
Mumbai Central	1
Secunderabad Junction	1
Visakhapatnam Junction	1
Bilaspur Junction	1
Gorakhpur Junction	1

Name: Originating Station, dtype: int64

Terminal City

Madgaon	2
Varanasi	1
Ajmer	1
Ahmedabad	1
Bhopal	1
Jabalpur	1
Hubballi - Dharwad	1
Ranchi	1
Guwahati	1
Dehradun	1
Puri	1
Thiruvananthapuram	1
Coimbatore	1
Katra	1
Tirupati	1
Delhi	1
Shirdi	1
Solapur	1
Hyderabad	1
Siliguri	1
Nagpur	1
Mysuru	1
Andaura	1
Gandhinagar	1
Charbagh	1

Name: Terminal City, dtype: int64

Terminal Station

Madgaon Junction	2
Varanasi Junction	1
Ajmer Junction	1
Sabarmati Junction	1
Bhopal Junction	1
Jabalpur Junction	1
Dharwad	1
Ranchi Junction	1
Guwahati	1
Dehradun Terminal	1
Puri	1
Thiruvananthapuram Central	1
Coimbatore Junction	1
Shri Mata Vaishno Devi Katra	1
Tirupati	1
Hazrat Nizamuddin	1
Sainagar Shirdi	1
Solapur	1
Secunderabad Junction	1
New Jalpaiguri Junction	1
Nagpur Junction	1
Mysore Junction	1
Amb Andaura	1
Gandhinagar Capital	1
Lucknow Charbagh	1

Name: Terminal Station, dtype: int64

Operator

NR	4
CR	4
SR	3
WR	2
WCR	2
NWR	2

SECR 1
ER 1
ECoR 1
SCR 1
SER 1
NFR 1
ECR 1
SWR 1
NER 1
Name: Operator, dtype: int64

No. of Cars

16 16
8 10
Name: No. of Cars, dtype: int64

Frequency

Except Tuesdays 8
Except Wednesdays 6
Except Thursdays 3
Except Saturdays 3
Except Sundays 2
Except Fridays 1
Except Wednesdays (22225) , Except Thursdays (22226) 1
Except Fridays\n(Non-Monsoon) 1
Monday, Wednesday, Friday (22229)\nTuesday, Thursday, Saturday (22230)\n(Monsoon) 1
Name: Frequency, dtype: int64

Distance

412 km (256 mi) 2
586 km (364 mi) 2
759 km (472 mi) 1
587 km (365 mi) 1
449 km (279 mi) 1
250 km (160 mi) 1
337 km (209 mi) 1
490 km (300 mi) 1
379 km (235 mi) 1
407 km (253 mi) 1
304 km (189 mi) 1
500 km (310 mi) 1
428 km (266 mi) 1
655 km (407 mi) 1
495 km (308 mi) 1
661 km (411 mi) 1
702 km (436 mi) 1
339 km (211 mi) 1
452 km (281 mi) 1
698 km (434 mi) 1
565 km (351 mi) 1
496 km (308 mi) 1
522 km (324 mi) 1
296 km (184 mi) 1
Name: Distance, dtype: int64

Travel Time

06h 25m 3
08h 00m 2
06h 30m 2
05h 30m 2
07h 30m 2
04h 45m 1
06h 10m 1
03h 05m 1
04h 40m 1
06h 00m 1
10h 05m\n(Monsoon) 1
07h 45m\n(Non-Monsoon) 1
05h 15m 1
08h 05m 1
05h 50m 1
08h 15m 1
05h 20m 1
08h 30m 1
05h 10m 1
04h 15m 1
Name: Travel Time, dtype: int64

Speed

```
130 km/h (81 mph)    14
110 km/h (68 mph)     8
120 km/h (75 mph)     2
130 km/h (81 mph)     1
160 km/h (99 mph)     1
Name: Speed, dtype: int64
```

Average Speed

```
82 km/h (51 mph)      5
73 km/h (45 mph)      3
79 km/h (49 mph)      2
75 km/h (47 mph)      2
64 km/h (40 mph)      2
95 km/h (59 mph)      1
74 km/h (46 mph)      1
76 km/h (47 mph)      1
63 km/h (39 mph)      1
57 km/h (35 mph)\n(Monsoon)  1
75 km/h (47 mph)\n(Non-Monsoon)  1
85 km/h (53 mph)      1
78 km/h (48 mph)      1
80 km/h (50 mph)      1
94 km/h (58 mph)      1
70 km/h (43 mph)      1
71 km/h (44 mph)      1
Name: Average Speed, dtype: int64
```

Inauguration

```
6/27/2023    6
7/7/2023     2
4/8/2023     2
2/10/2023    2
5/29/2023    1
5/25/2023    1
5/18/2023    1
4/25/2023    1
4/12/2023    1
2/15/2019    1
10/3/2019    1
1/15/2023    1
12/30/2022   1
12/11/2022   1
11/11/2022   1
10/13/2022   1
9/30/2022    1
4/1/2023     1
Name: Inauguration, dtype: int64
```

Average occupancy

```
100%    3
70%      2
94%      2
126%     1
177%     1
53%      1
37%      1
44%      1
72%      1
118%     1
91%      1
99%      1
150%     1
114%     1
110%     1
90%      1
93%      1
120%     1
96%      1
75%      1
132%     1
77%      1
Name: Average occupancy, dtype: int64
```

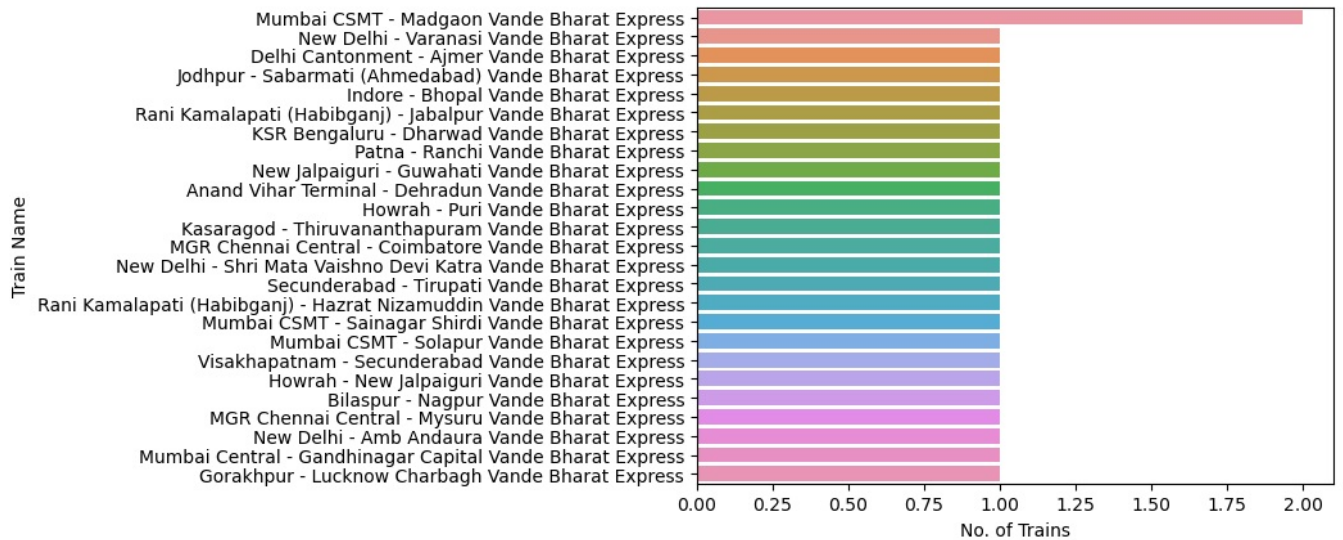
Exploratory Data Analysis (EDA)

```
In [69]: df.columns
```

```
Out[69]: Index(['Train Name', 'Train Number', 'Originating City', 'Originating Station',
      'Terminal City', 'Terminal Station', 'Operator', 'No. of Cars',
      'Frequency', 'Distance', 'Travel Time', 'Speed', 'Average Speed',
      'Inauguration', 'Average occupancy'],
      dtype='object')
```

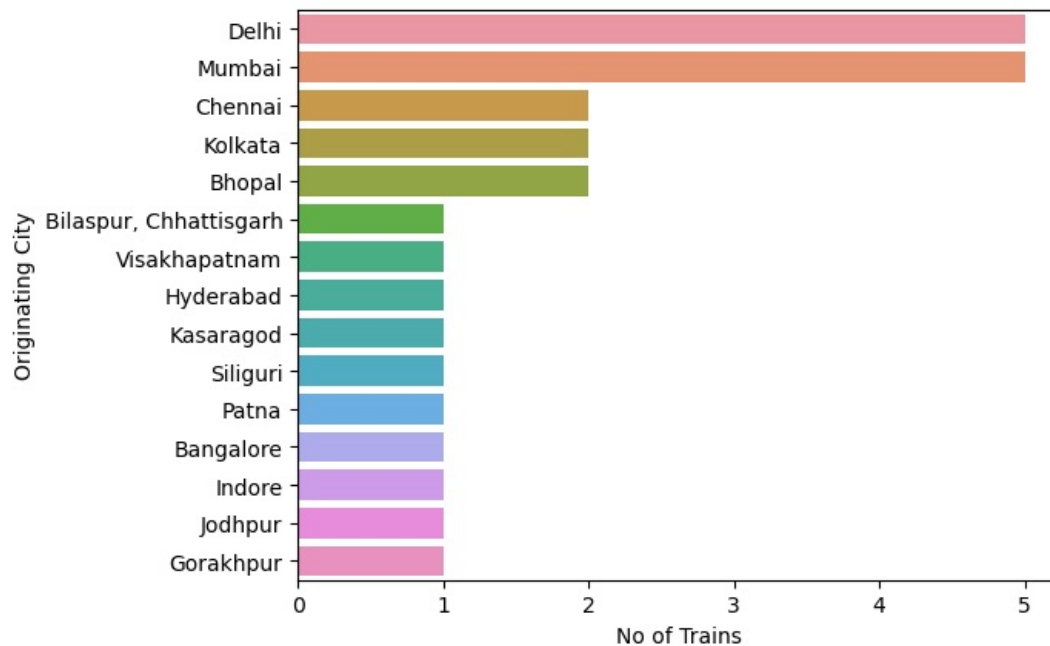
```
In [70]: sns.barplot(y=df['Train Name'].value_counts().keys(), x=df['Train Name'].value_counts())
plt.title("", fontsize=20, fontweight='bold')
plt.ylabel('Train Name')
plt.xlabel('No. of Trains')
```

```
Out[70]: Text(0.5, 0, 'No. of Trains')
```



```
In [71]: sns.barplot(y=df['Originating City'].value_counts().keys(), x=df['Originating City'].value_counts())
plt.ylabel('Originating City')
plt.xlabel('No of Trains')
```

```
Out[71]: Text(0.5, 0, 'No of Trains')
```



```
In [72]: df.columns
```

```
Out[72]: Index(['Train Name', 'Train Number', 'Originating City', 'Originating Station',
      'Terminal City', 'Terminal Station', 'Operator', 'No. of Cars',
      'Frequency', 'Distance', 'Travel Time', 'Speed', 'Average Speed',
      'Inauguration', 'Average occupancy'],
      dtype='object')
```

```
In [73]: cat = []
con = []

for i in df.columns:
    if df[i].dtypes == 'object':
        cat.append(i)
    else:
        con.append(i)
```

```
In [74]: con
```



```
Out[74]: ['No. of Cars']
```

```
In [75]: cat
```

```
Out[75]: ['Train Name',  
         'Train Number',  
         'Originating City',  
         'Originating Station',  
         'Terminal City',  
         'Terminal Station',  
         'Operator',  
         'Frequency',  
         'Distance',  
         'Travel Time',  
         'Speed',  
         'Average Speed',  
         'Inauguration',  
         'Average occupancy']
```

```
In [76]: for i in cat:                                # To see unique values of of all categorical columns.  
         print(i, len(df[i].unique()))
```

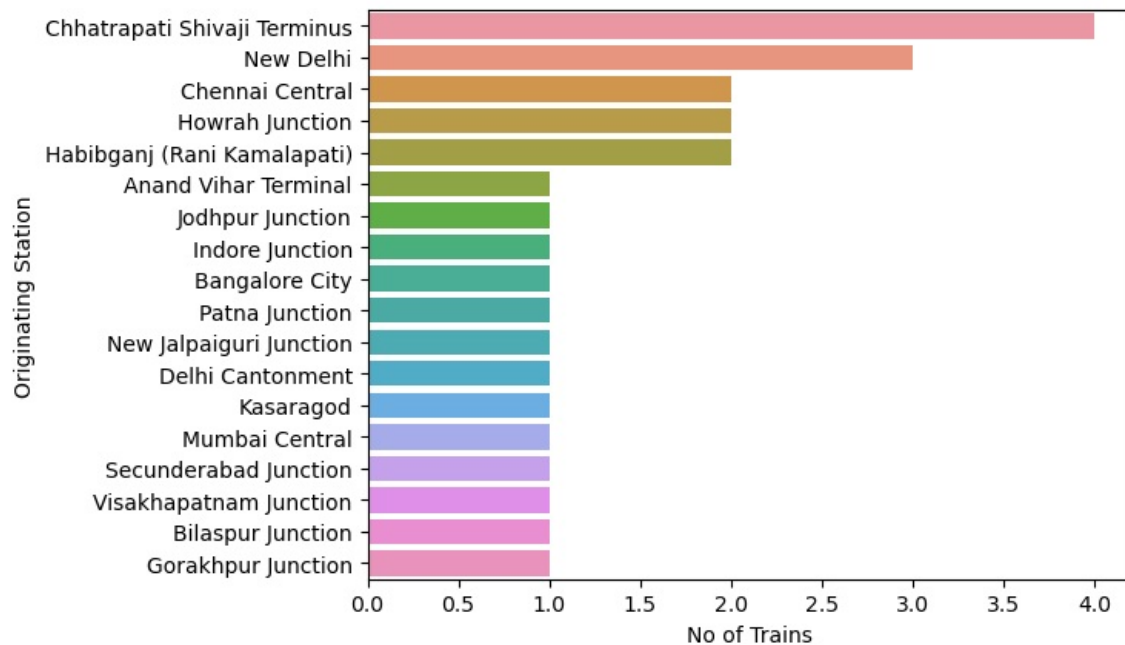
```
Train Name 25  
Train Number 25  
Originating City 15  
Originating Station 18  
Terminal City 25  
Terminal Station 25  
Operator 15  
Frequency 9  
Distance 24  
Travel Time 20  
Speed 5  
Average Speed 17  
Inauguration 18  
Average occupancy 22
```

```
In [77]: for i in con:                                # To see unique values of of all continuous columns.  
         print(i, len(df[i].unique()))
```

```
No. of Cars 2
```

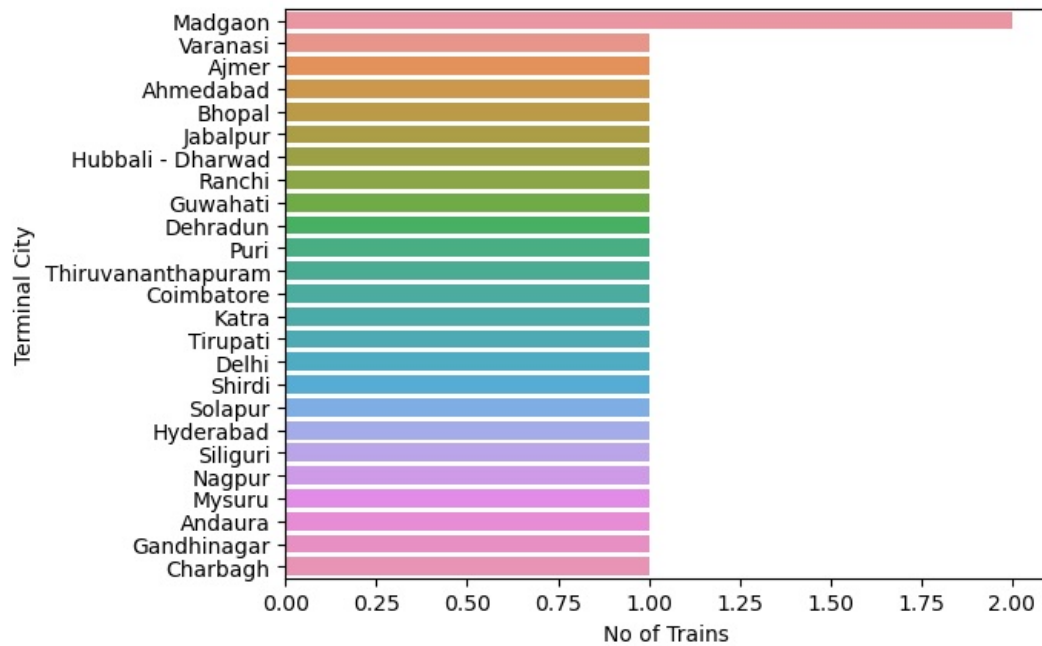
```
In [78]: sns.barplot(y=df['Originating Station'].value_counts().keys(),x=df['Originating Station'].value_counts())  
plt.ylabel('Originating Station')  
plt.xlabel('No of Trains')
```

```
Out[78]: Text(0.5, 0, 'No of Trains')
```



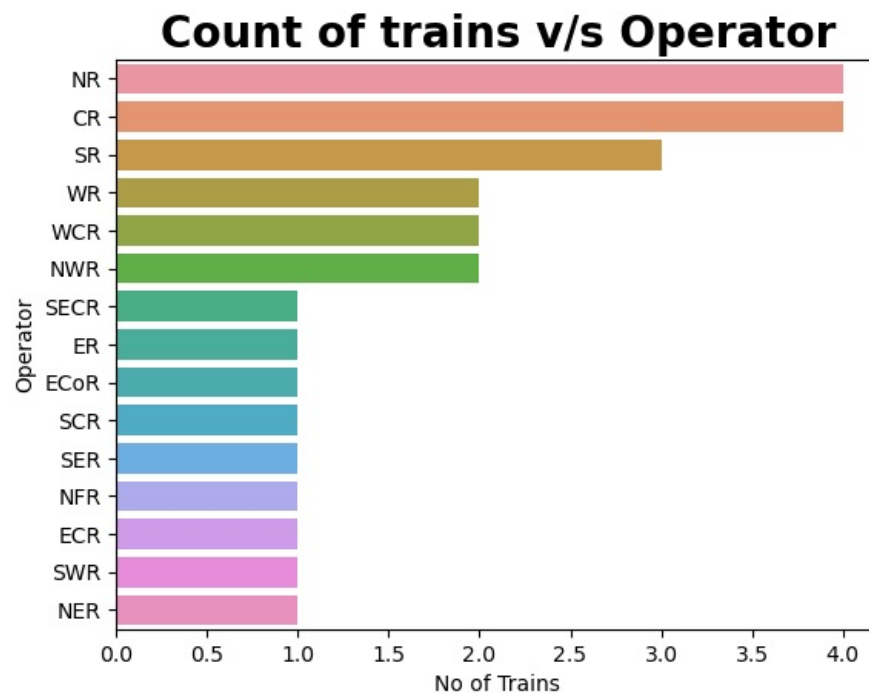
```
In [79]: sns.barplot(y=df['Terminal City'].value_counts().keys(),x=df['Terminal City'].value_counts())  
plt.ylabel('Terminal City')  
plt.xlabel('No of Trains')
```

```
Out[79]: Text(0.5, 0, 'No of Trains')
```



```
In [80]: sns.barplot(y=df['Operator'].value_counts().keys(),x=df['Operator'].value_counts())
plt.title("Count of trains v/s Operator",fontsize=20,fontweight="bold")
plt.ylabel('Operator')
plt.xlabel('No of Trains')
```

Out[80]: Text(0.5, 0, 'No of Trains')

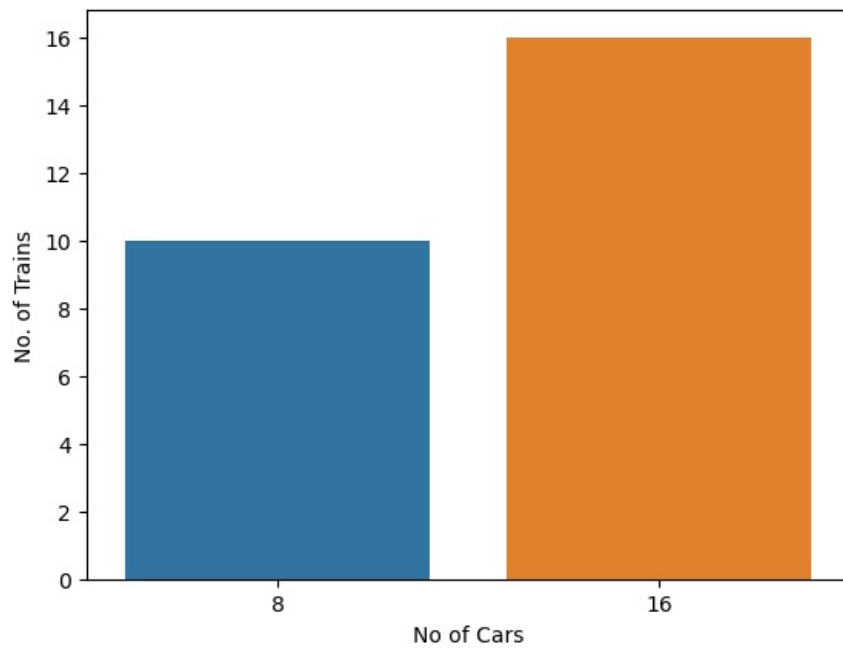


```
In [81]: df['No. of Cars'].value_counts()
```

Out[81]: 16 16
8 10
Name: No. of Cars, dtype: int64

```
In [82]: sns.barplot(x=df['No. of Cars'].value_counts().keys(),y=df['No. of Cars'].value_counts())
plt.ylabel('No. of Trains')
plt.xlabel('No of Cars')
```

Out[82]: Text(0.5, 0, 'No of Cars')

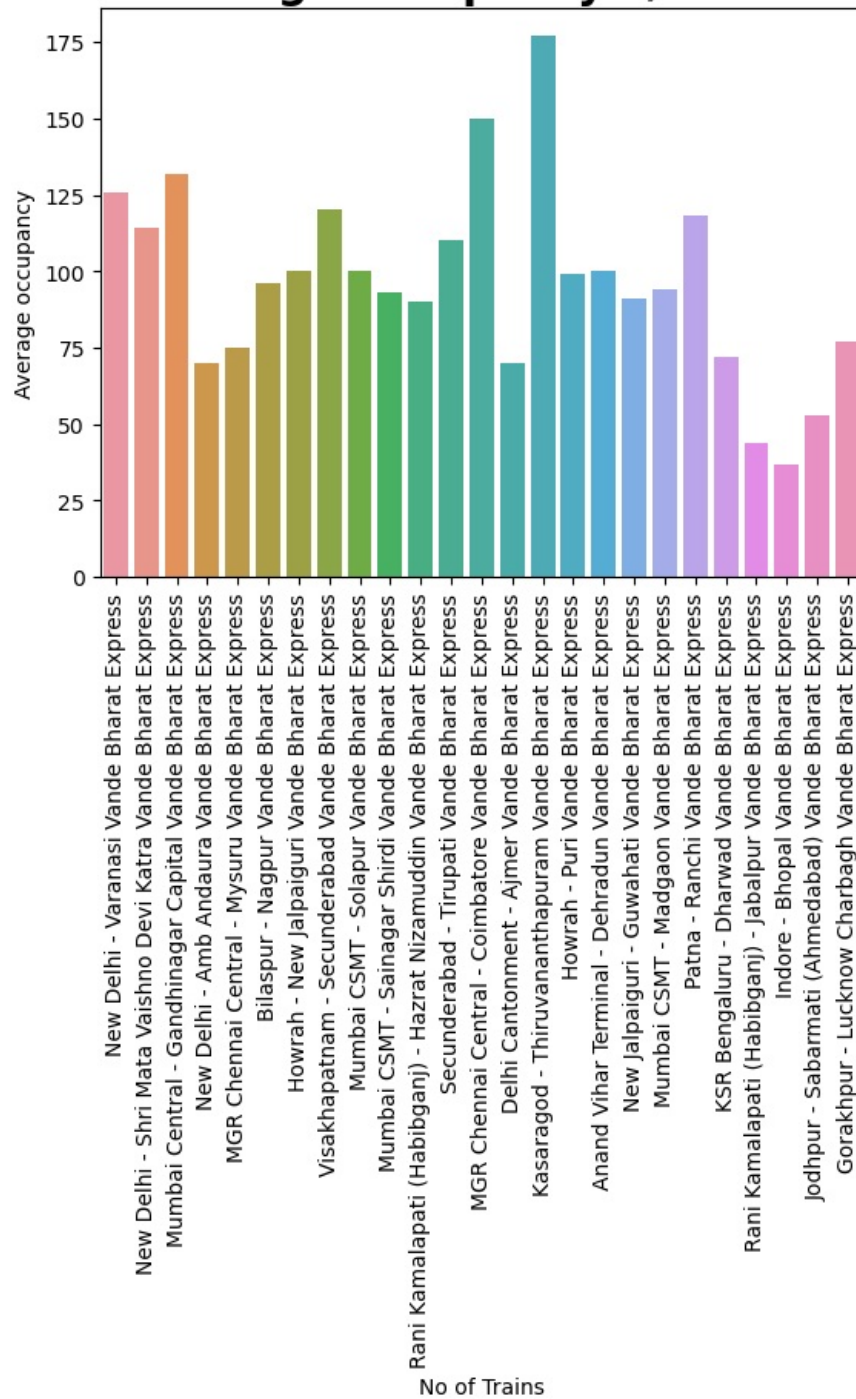


```
In [83]: df['Average occupancy'] = df['Average occupancy'].str.rstrip('%').astype(float)
```

```
In [84]: sns.barplot(y='Average occupancy',x='Train Name',data=df)
plt.title("Average occupancy v/s Train",fontsize=20,fontweight="bold")
plt.xticks(rotation='vertical')
plt.ylabel('Average occupancy')
plt.xlabel('No of Trains')
```

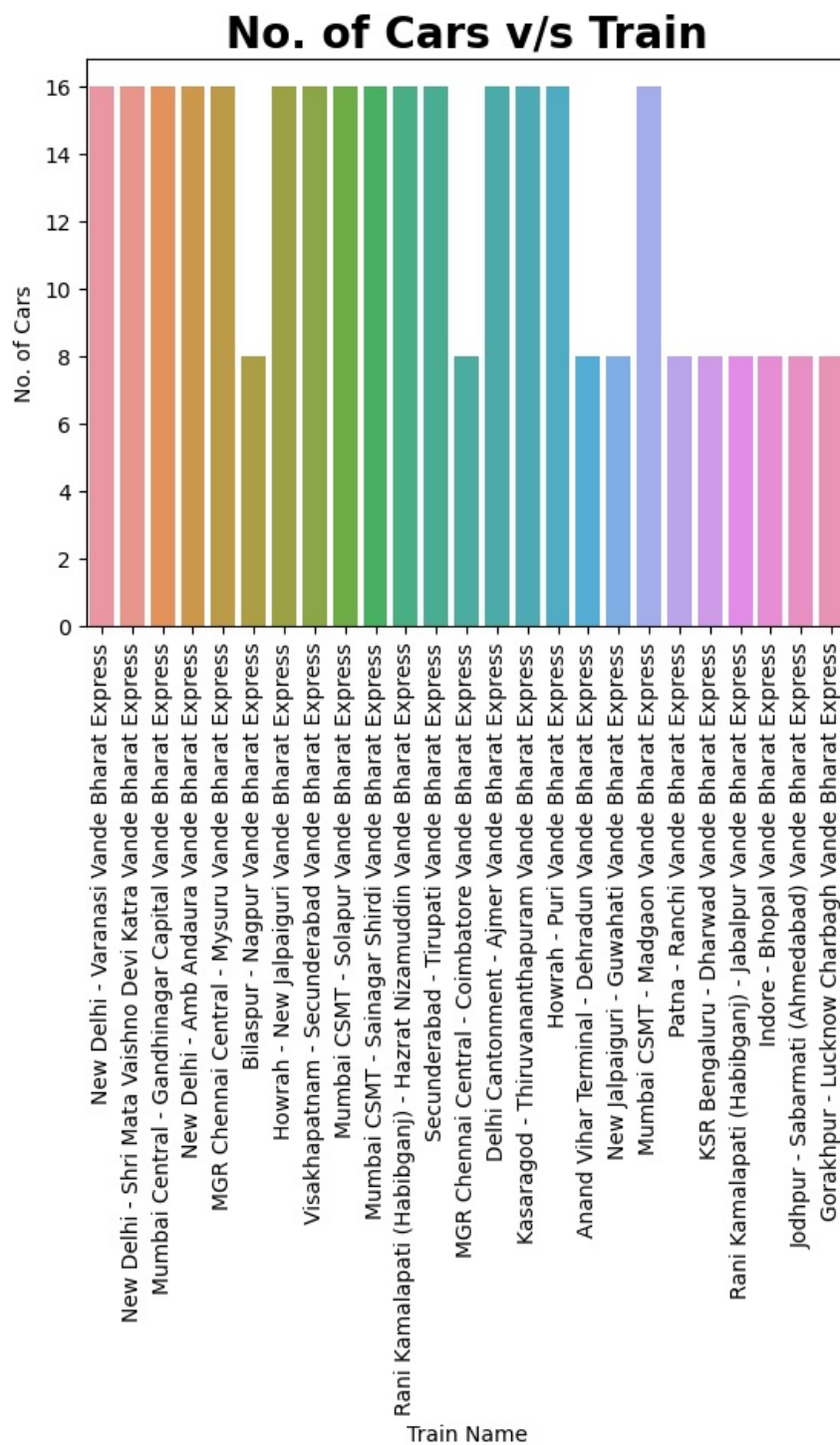
```
Out[84]: Text(0.5, 0, 'No of Trains')
```

Average occupancy v/s Train



```
In [85]: sns.barplot(y='No. of Cars',x='Train Name',data=df)
plt.title("No. of Cars v/s Train",fontsize=20,fontweight="bold")
plt.xticks(rotation='vertical')
plt.ylabel('No. of Cars')
plt.xlabel('Train Name')
```

```
Out[85]: Text(0.5, 0, 'Train Name')
```



```
In [86]: df.head()
```

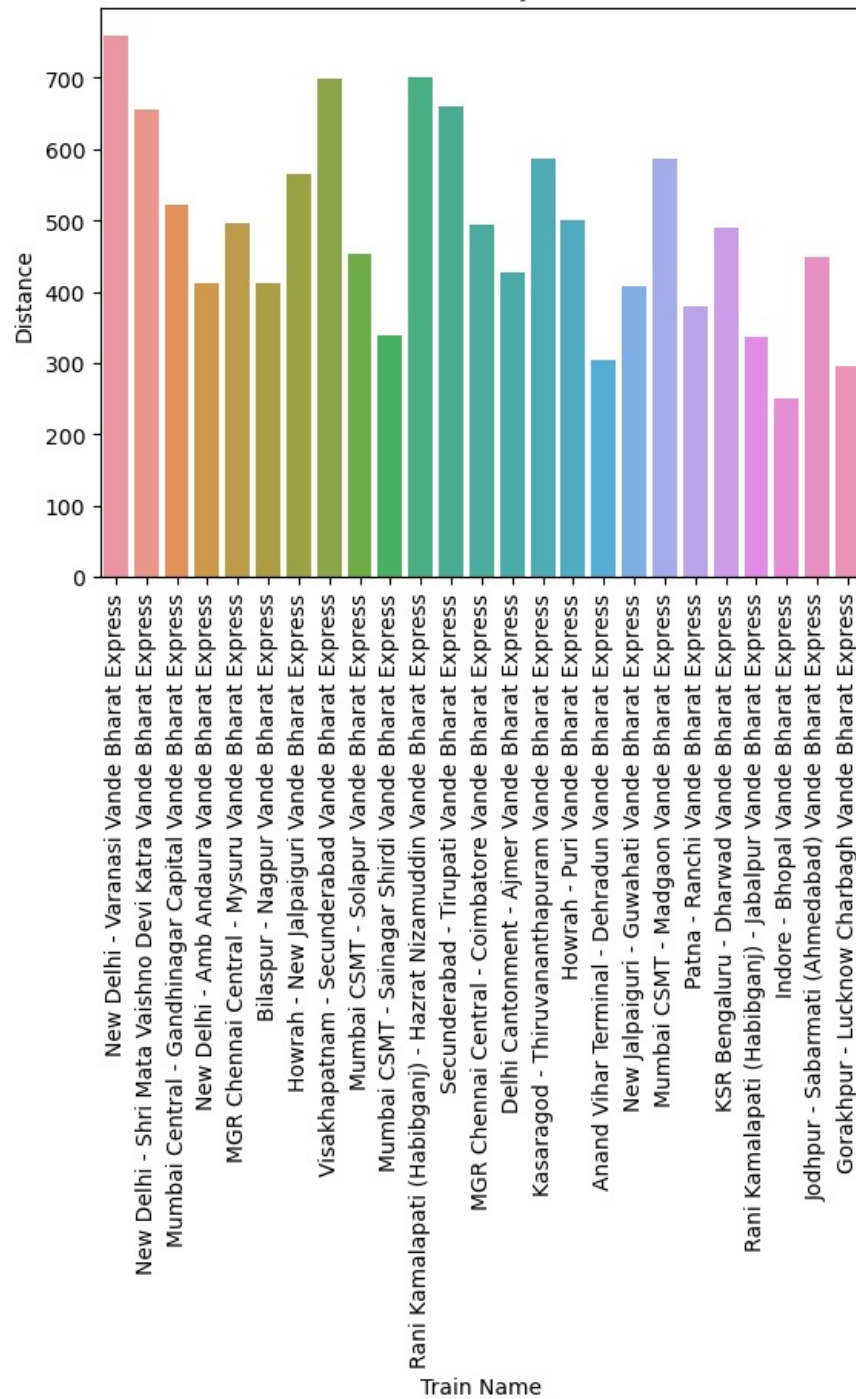
Out[86]:

	Train Name	Train Number	Originating City	Originating Station	Terminal City	Terminal Station	Operator	No. of Cars	Frequency	Distance	Travel Time	Speed	Average S
0	New Delhi - Varanasi Vande Bharat Express	22435/22436	Delhi	New Delhi	Varanasi	Varanasi Junction	NR	16	Except Thursdays	759 km (472 mi)	08h 00m	130 km/h (81 mph)	95 (59)
1	New Delhi - Shri Mata Vaishno Devi Katra Vande...	22439/22440	Delhi	New Delhi	Katra	Shri Mata Vaishno Devi Katra	NR	16	Except Tuesdays	655 km (407 mi)	08h 00m	130 km/h (81 mph)	82 (51)
2	Mumbai Central - Gandhinagar Capital Vande Bha...	20901/20902	Mumbai	Mumbai Central	Gandhinagar	Gandhinagar Capital	WR	16	Except Wednesdays	522 km (324 mi)	06h 25m	130 km/h (81 mph)	82 (51)
3	New Delhi - Amb Andaura Vande Bharat Express	22447/22448	Delhi	New Delhi	Andaura	Amb Andaura	NR	16	Except Fridays	412 km (256 mi)	05h 10m	130 km/h (81 mph)	79 (49)
4	MGR Chennai Central - Mysuru Vande Bharat Express	20607/20608	Chennai	Chennai Central	Mysuru	Mysore Junction	SR	16	Except Wednesdays	496 km (308 mi)	06h 30m	130 km/h (81 mph)	79 (49)

```
In [89]: df['Distance'] = df['Distance'].str.extract(r'(\d+)').astype(float)
sns.barplot(x='Train Name',y='Distance',data=df)
plt.title("Distance v/s Train",fontsize=20,fontweight="bold")
plt.xticks(rotation='vertical')
plt.ylabel('Distance')
plt.xlabel('Train Name')
```

Out[89]: Text(0.5, 0, 'Train Name')

Distance v/s Train



```
In [90]: df_sorted = df.sort_values(by='Inauguration', ascending=False)
print(df_sorted[['Train Name', 'Inauguration']])
```

	Train Name	Inauguration
2	Mumbai Central - Gandhinagar Capital Vande Bha...	9/30/2022
25	Gorakhpur - Lucknow Charbagh Vande Bharat Express	7/7/2023
24	Jodhpur - Sabarmati (Ahmedabad) Vande Bharat E...	7/7/2023
23	Indore - Bhopal Vande Bharat Express	6/27/2023
22	Rani Kamalapati (Habibganj) - Jabalpur Vande B...	6/27/2023
21	KSR Bengaluru - Dharwad Vande Bharat Express	6/27/2023
20	Patna - Ranchi Vande Bharat Express	6/27/2023
19	Mumbai CSMT - Madgaon Vande Bharat Express	6/27/2023
18	Mumbai CSMT - Madgaon Vande Bharat Express	6/27/2023
17	New Jalpaiguri - Guwahati Vande Bharat Express	5/29/2023
16	Anand Vihar Terminal - Dehradun Vande Bharat E...	5/25/2023
15	Howrah - Puri Vande Bharat Express	5/18/2023
11	Secunderabad - Tirupati Vande Bharat Express	4/8/2023
12	MGR Chennai Central - Coimbatore Vande Bharat ...	4/8/2023
14	Kasaragod - Thiruvananthapuram Vande Bharat Ex...	4/25/2023
13	Delhi Cantonment - Ajmer Vande Bharat Express	4/12/2023
10	Rani Kamalapati (Habibganj) - Hazrat Nizamuddi...	4/1/2023
0	New Delhi - Varanasi Vande Bharat Express	2/15/2019
9	Mumbai CSMT - Sainagar Shirdi Vande Bharat Exp...	2/10/2023
8	Mumbai CSMT - Solapur Vande Bharat Express	2/10/2023
6	Howrah - New Jalpaiguri Vande Bharat Express	12/30/2022
5	Bilaspur - Nagpur Vande Bharat Express	12/11/2022
4	MGR Chennai Central - Mysuru Vande Bharat Express	11/11/2022
1	New Delhi - Shri Mata Vaishno Devi Katra Vande...	10/3/2019
3	New Delhi - Amb Andaura Vande Bharat Express	10/13/2022
7	Visakhapatnam - Secunderabad Vande Bharat Express	1/15/2023

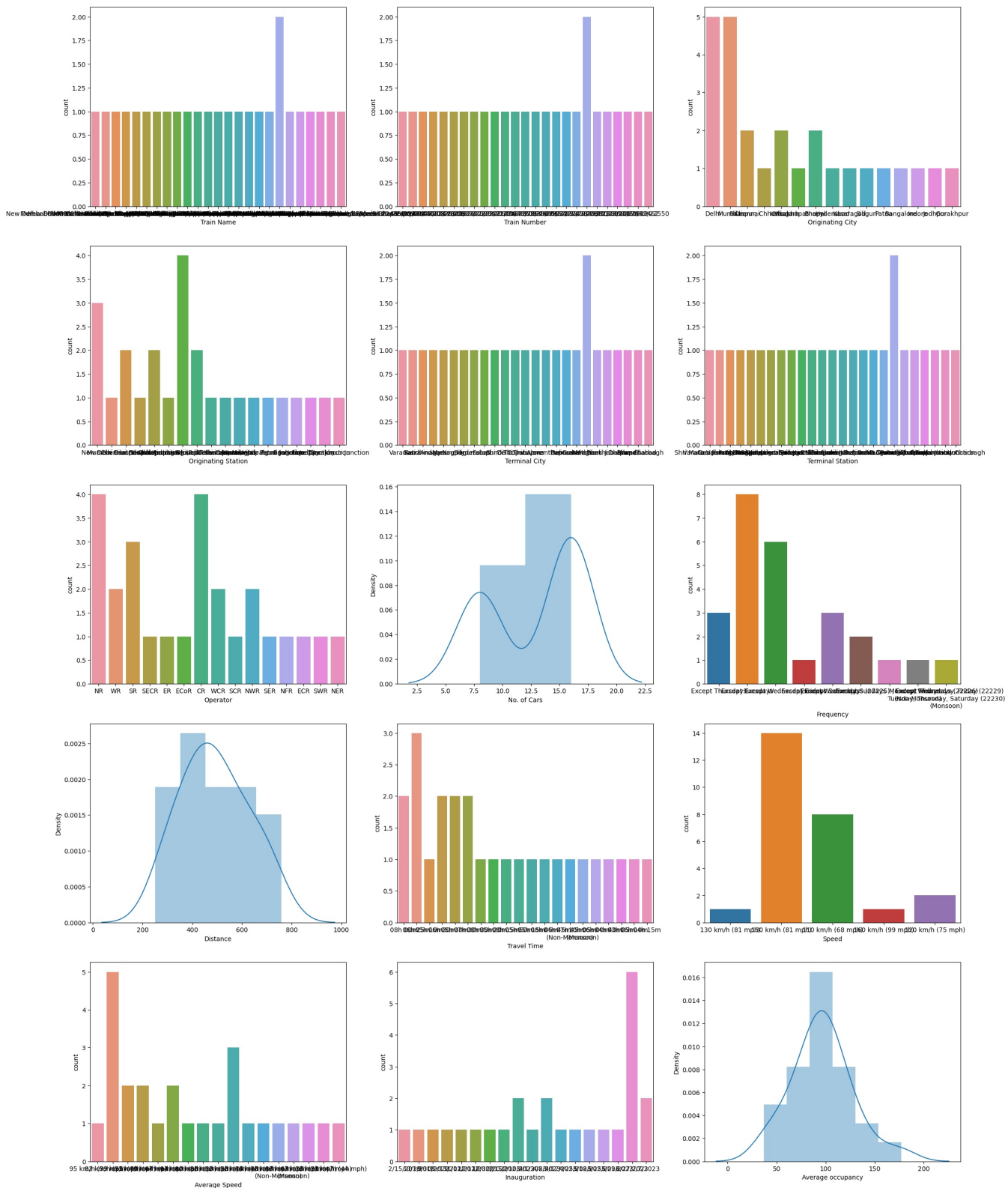
```
In [95]: cols = list(df.columns)
```

```
In [97]: len(cols)
```

```
Out[97]: 15
```

```
In [99]: import matplotlib.pyplot as plt
import seaborn as sns
from warnings import filterwarnings
filterwarnings("ignore")

plt.figure(figsize=(25,61))
index = 1
for i in cols:
    if(df[i].dtypes == "object"):
        plt.subplot(9,3, index)
        sns.countplot(df[i])
        index = index + 1 # index is +=1
    else:
        plt.subplot(9,3, index)
        sns.distplot(df[i])
        index = index + 1 # index is +=1
```

In [93]: df

Out[93]:

	Train Name	Train Number	Originating City	Originating Station	Terminal City	Terminal Station	Operator	No. of Cars	Frequency
0	New Delhi - Varanasi Vande Bharat Express	22435/22436	Delhi	New Delhi	Varanasi	Varanasi Junction	NR	16	Except Thursdays
1	New Delhi - Shri Mata Vaishno Devi Katra Vande...	22439/22440	Delhi	New Delhi	Katra	Shri Mata Vaishno Devi Katra	NR	16	Except Tuesdays
2	Mumbai Central - Gandhinagar Capital Vande Bha...	20901/20902	Mumbai	Mumbai Central	Gandhinagar	Gandhinagar Capital	WR	16	Except Wednesdays
3	New Delhi - Amb Andaura Vande Bharat Express	22447/22448	Delhi	New Delhi	Andaura	Amb Andaura	NR	16	Except Fridays
4	MGR Chennai Central - Mysuru Vande Bharat Express	20607/20608	Chennai	Chennai Central	Mysuru	Mysore Junction	SR	16	Except Wednesdays

5	Bilaspur - Nagpur Vande Bharat Express	20825/20826	Bilaspur, Chhattisgarh	Bilaspur Junction	Nagpur	Nagpur Junction	SECR	8	Except Saturdays
6	Howrah - New Jalpaiguri Vande Bharat Express	22301/22302	Kolkata	Howrah Junction	Siliguri	New Jalpaiguri Junction	ER	16	Except Wednesdays
7	Visakhapatnam - Secunderabad Vande Bharat Express	20833/20834	Visakhapatnam	Visakhapatnam Junction	Hyderabad	Secunderabad Junction	ECoR	16	Except Sundays
8	Mumbai CSMT - Solapur Vande Bharat Express	22225/22226	Mumbai	Chhatrapati Shivaji Terminus	Solapur	Solapur	CR	16	Except Wednesdays (22225) , Except Thursdays (...)
9	Mumbai CSMT - Sainagar Shirdi Vande Bharat Exp...	22223/22224	Mumbai	Chhatrapati Shivaji Terminus	Shirdi	Sainagar Shirdi	CR	16	Except Tuesdays
10	Rani Kamalapati (Habibganj) - Hazrat Nizamuddin...	20171/20172	Bhopal	Habibganj (Rani Kamalapati)	Delhi	Hazrat Nizamuddin	WCR	16	Except Saturdays
11	Secunderabad - Tirupati Vande Bharat Express	20701/20702	Hyderabad	Secunderabad Junction	Tirupati	Tirupati	SCR	16	Except Tuesdays
12	MGR Chennai Central - Coimbatore Vande Bharat ...	20643/20644	Chennai	Chennai Central	Coimbatore	Coimbatore Junction	SR	8	Except Wednesdays
13	Delhi Cantonment - Ajmer Vande Bharat Express	20977/20978	Delhi	Delhi Cantonment	Ajmer	Ajmer Junction	NWR	16	Except Wednesdays
14	Kasaragod - Thiruvananthapuram Vande Bharat Ex...	20633/20634	Kasaragod	Kasaragod	Thiruvananthapuram	Thiruvananthapuram Central	SR	16	Except Thursdays
15	Howrah - Puri Vande Bharat Express	22895/22896	Kolkata	Howrah Junction	Puri	Puri	SER	16	Except Thursdays
16	Anand Vihar Terminal - Dehradun Vande Bharat E...	22457/22458	Delhi	Anand Vihar Terminal	Dehradun	Dehradun Terminal	NR	8	Except Wednesdays
17	New Jalpaiguri - Guwahati Vande Bharat Express	22227/22228	Siliguri	New Jalpaiguri Junction	Guwahati	Guwahati	NFR	8	Except Tuesdays
18	Mumbai CSMT - Madgaon Vande Bharat Express	22229/22230	Mumbai	Chhatrapati Shivaji Terminus	Madgaon	Madgaon Junction	CR	16	Except Fridays\n(Non-Monsoon)
19	Mumbai CSMT - Madgaon Vande Bharat Express	22229/22230	Mumbai	Chhatrapati Shivaji Terminus	Madgaon	Madgaon Junction	CR	16	Monday, Wednesday, Friday (22229)\nTuesday, Th...
20	Patna - Ranchi Vande Bharat Express	22349/22350	Patna	Patna Junction	Ranchi	Ranchi Junction	ECR	8	Except Tuesdays
21	KSR Bengaluru - Dharwad Vande Bharat Express	20661/20662	Bangalore	Bangalore City	Hubbali - Dharwad	Dharwad	SWR	8	Except Tuesdays
22	Rani Kamalapati (Habibganj) - Jabalpur Vande B...	20173/20174	Bhopal	Habibganj (Rani Kamalapati)	Jabalpur	Jabalpur Junction	WCR	8	Except Tuesdays
23	Indore - Bhopal Vande Bharat Express	20911/20912	Indore	Indore Junction	Bhopal	Bhopal Junction	WR	8	Except Sundays
24	Jodhpur - Sabarmati (Ahmedabad) Vande Bharat E...	12461/12462	Jodhpur	Jodhpur Junction	Ahmedabad	Sabarmati Junction	NWR	8	Except Tuesdays
25	Gorakhpur - Lucknow Charbagh Vande Bharat Express	22549/22550	Gorakhpur	Gorakhpur Junction	Charbagh	Lucknow Charbagh	NER	8	Except Saturdays

In [125...]: # Trains with distance more than 600

```
df[df.Distance > 600][['Train Name', 'Train Number', 'Distance']]
```

Out[125]:

	Train Name	Train Number	Distance
0	New Delhi - Varanasi Vande Bharat Express	22435/22436	759.0
1	New Delhi - Shri Mata Vaishno Devi Katra Vande...	22439/22440	655.0
7	Visakhapatnam - Secunderabad Vande Bharat Express	20833/20834	698.0
10	Rani Kamalapati (Habibganj) - Hazrat Nizamuddi...	20171/20172	702.0
11	Secunderabad - Tirupati Vande Bharat Express	20701/20702	661.0

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