In [1]:
```
import opendatasets as od
```

In [9]:
```
od.download('https://www.kaggle.com/datasets/sobhanmoosavi/us-accidents/code?dat
```

```
Please provide your Kaggle credentials to download this dataset. Learn more: htt
p://bit.ly/kaggle-creds
Your Kaggle username: taniakheria
Your Kaggle Key: ········
Downloading us-accidents.zip to .\us-accidents
100%|██████████| 653M/653M [02:02<00:00, 5.58MB/s]
```

In [1]:
```
path = 'us-accidents/US_Accidents_March23.csv'
```

In [2]:
```
import pandas as pd
df = pd.read_csv(path)
```

In [3]:
```
df.head()
```

Out[3]:

	ID	Source	Severity	Start_Time	End_Time	Start_Lat	Start_Lng	End_Lat	End_Ln
0	A-1	Source2	3	2016-02-08 05:46:00	2016-02-08 11:00:00	39.865147	-84.058723	NaN	Na
1	A-2	Source2	2	2016-02-08 06:07:59	2016-02-08 06:37:59	39.928059	-82.831184	NaN	Na
2	A-3	Source2	2	2016-02-08 06:49:27	2016-02-08 07:19:27	39.063148	-84.032608	NaN	Na
3	A-4	Source2	3	2016-02-08 07:23:34	2016-02-08 07:53:34	39.747753	-84.205582	NaN	Na
4	A-5	Source2	2	2016-02-08 07:39:07	2016-02-08 08:09:07	39.627781	-84.188354	NaN	Na

5 rows × 46 columns

In [17]:
```
df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 7728394 entries, 0 to 7728393
Data columns (total 46 columns):
 #   Column                 Dtype  
---  ------                 -----  
 0   ID                     object 
 1   Source                 object 
 2   Severity               int64  
 3   Start_Time             object 
 4   End_Time               object 
 5   Start_Lat              float64
 6   Start_Lng              float64
 7   End_Lat                float64
 8   End_Lng                float64
 9   Distance(mi)           float64
 10  Description            object 
 11  Street                 object 
 12  City                   object 
 13  County                 object 
 14  State                  object 
 15  Zipcode                object 
 16  Country                object 
 17  Timezone               object 
 18  Airport_Code           object 
 19  Weather_Timestamp      object 
 20  Temperature(F)         float64
 21  Wind_Chill(F)          float64
 22  Humidity(%)            float64
 23  Pressure(in)           float64
 24  Visibility(mi)         float64
 25  Wind_Direction         object 
 26  Wind_Speed(mph)        float64
 27  Precipitation(in)      float64
 28  Weather_Condition      object 
 29  Amenity                bool   
 30  Bump                   bool   
 31  Crossing               bool   
 32  Give_Way               bool   
 33  Junction               bool   
 34  No_Exit                bool   
 35  Railway                bool   
 36  Roundabout             bool   
 37  Station                bool   
 38  Stop                   bool   
 39  Traffic_Calming        bool   
 40  Traffic_Signal         bool   
 41  Turning_Loop           bool   
 42  Sunrise_Sunset         object 
 43  Civil_Twilight         object 
 44  Nautical_Twilight      object 
 45  Astronomical_Twilight  object 
dtypes: bool(13), float64(12), int64(1), object(20)
memory usage: 2.0+ GB
```

In [18]:

```
df.isnull().sum()
```

Out[18]:
```
ID                             0
Source                         0
Severity                       0
Start_Time                     0
End_Time                       0
Start_Lat                      0
Start_Lng                      0
End_Lat                  3402762
End_Lng                  3402762
Distance(mi)                   0
Description                    5
Street                     10869
City                         253
County                         0
State                          0
Zipcode                     1915
Country                        0
Timezone                    7808
Airport_Code               22635
Weather_Timestamp         120228
Temperature(F)            163853
Wind_Chill(F)            1999019
Humidity(%)               174144
Pressure(in)              140679
Visibility(mi)            177098
Wind_Direction            175206
Wind_Speed(mph)           571233
Precipitation(in)        2203586
Weather_Condition         173459
Amenity                        0
Bump                           0
Crossing                       0
Give_Way                       0
Junction                       0
No_Exit                        0
Railway                        0
Roundabout                     0
Station                        0
Stop                           0
Traffic_Calming                0
Traffic_Signal                 0
Turning_Loop                   0
Sunrise_Sunset             23246
Civil_Twilight             23246
Nautical_Twilight          23246
Astronomical_Twilight      23246
dtype: int64
```

In [4]:
```
null_columns = df.isnull().sum().sort_values(ascending=False)
null_columns[:10]
```

```
Out[4]:  End_Lat              3402762
         End_Lng              3402762
         Precipitation(in)    2203586
         Wind_Chill(F)        1999019
         Wind_Speed(mph)       571233
         Visibility(mi)        177098
         Wind_Direction        175206
         Humidity(%)           174144
         Weather_Condition     173459
         Temperature(F)        163853
         dtype: int64
```

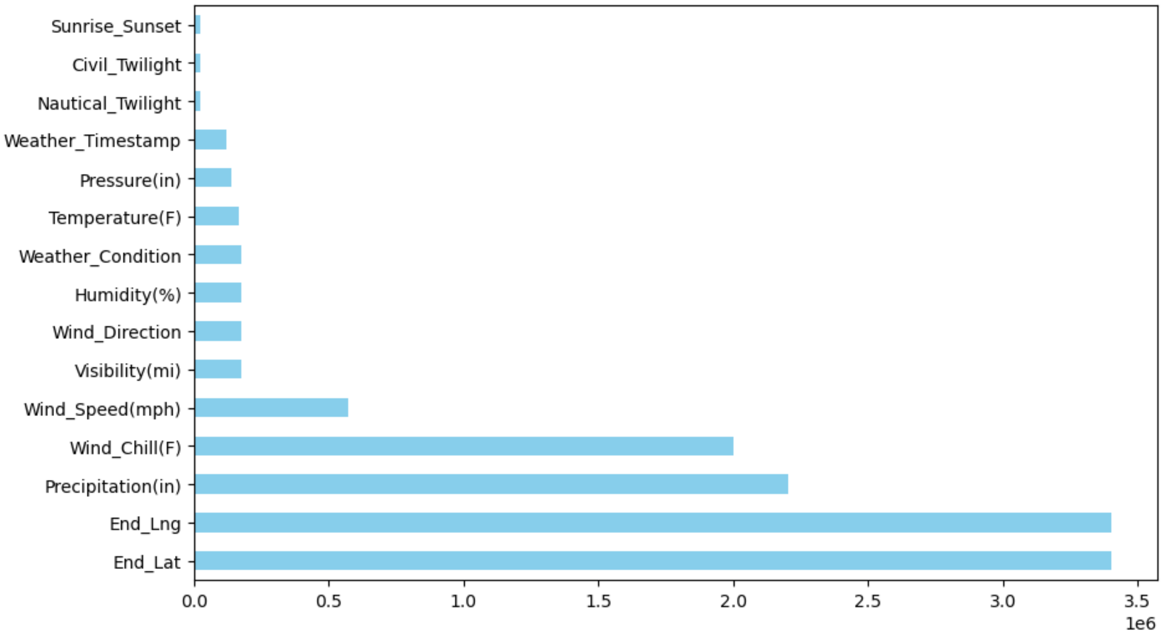
```
In [21]: type(null_columns)
```

```
Out[21]: pandas.core.series.Series
```

Columns containing max null values

```
In [6]: null_columns[:15].plot(kind='barh', color='skyblue', figsize=(10, 6))
```

```
Out[6]: <Axes: >
```



All the columns in the dataframe:

```
In [23]: df.columns
```

```
Out[23]: Index(['ID', 'Source', 'Severity', 'Start_Time', 'End_Time', 'Start_Lat',
                'Start_Lng', 'End_Lat', 'End_Lng', 'Distance(mi)', 'Description',
                'Street', 'City', 'County', 'State', 'Zipcode', 'Country', 'Timezone',
                'Airport_Code', 'Weather_Timestamp', 'Temperature(F)', 'Wind_Chill(F)',
                'Humidity(%)', 'Pressure(in)', 'Visibility(mi)', 'Wind_Direction',
                'Wind_Speed(mph)', 'Precipitation(in)', 'Weather_Condition', 'Amenity',
                'Bump', 'Crossing', 'Give_Way', 'Junction', 'No_Exit', 'Railway',
                'Roundabout', 'Station', 'Stop', 'Traffic_Calming', 'Traffic_Signal',
                'Turning_Loop', 'Sunrise_Sunset', 'Civil_Twilight', 'Nautical_Twilight',
                'Astronomical_Twilight'],
               dtype='object')
```

Distribution of accidents as per the cities

In [24]:

```
cities = df.City.value_counts().sort_values(ascending=False)
cities
```

Out[24]:

```
City
Miami                             186917
Houston                           169609
Los Angeles                       156491
Charlotte                         138652
Dallas                            130939
                                   ...  
Bon Secour                             1
Sidney Center                          1
Fluker                                 1
Mapleville                             1
American Fork-Pleasant Grove           1
Name: count, Length: 13678, dtype: int64
```

---

1. City with the highest number of accidents is Miami.

---

2. City with the second highest number of accidents is Houston.

In [25]:

```
#Converting the cities series to a dataframe:
cities_df = cities.reset_index()
cities_df
```

Out[25]:

	City	count
0	Miami	186917
1	Houston	169609
2	Los Angeles	156491
3	Charlotte	138652
4	Dallas	130939
...	...	...
13673	Bon Secour	1
13674	Sidney Center	1
13675	Fluker	1
13676	Mapleville	1
13677	American Fork-Pleasant Grove	1

13678 rows × 2 columns

In [11]:

```
#Expressing the city wise accidents in percentage
percentage_cities = (df.City.value_counts()/len(df)*100).sort_values(ascending=F
percentage_cities
```

Out[11]:

```
City
Miami                           2.418575
Houston                         2.194622
Los Angeles                     2.024884
Charlotte                       1.794060
Dallas                          1.694259
                                  ...
Bon Secour                      0.000013
Sidney Center                   0.000013
Fluker                          0.000013
Mapleville                      0.000013
American Fork-Pleasant Grove    0.000013
Name: count, Length: 13678, dtype: float64
```

In [12]:

```
percentage_cities_df = percentage_cities.reset_index()
percentage_cities_df
##This is used to find the column names
```

Out[12]:

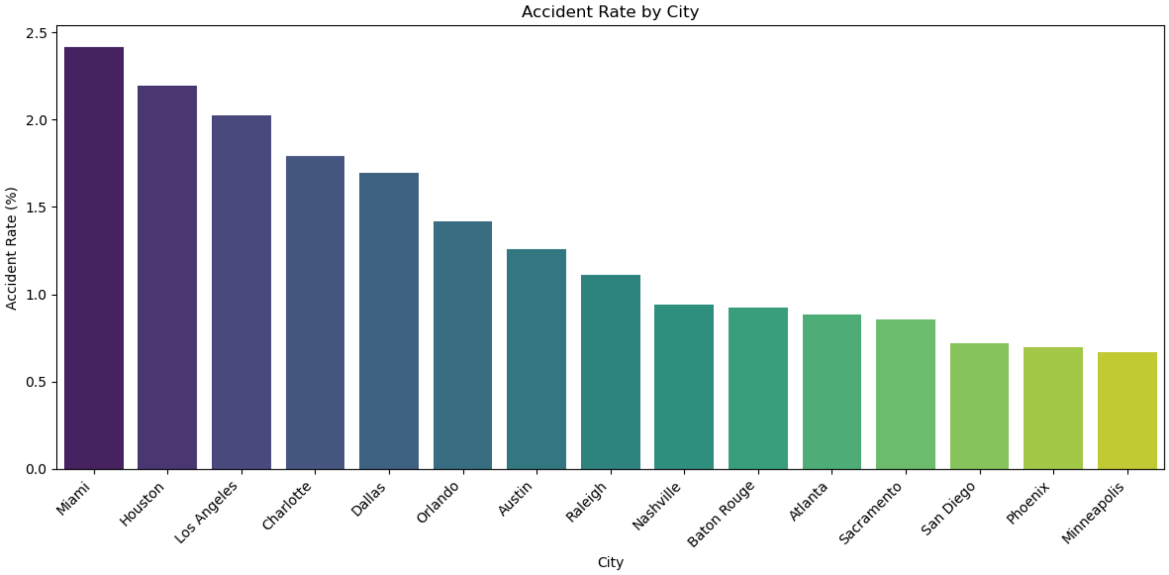
	City	count
0	Miami	2.418575
1	Houston	2.194622
2	Los Angeles	2.024884
3	Charlotte	1.794060
4	Dallas	1.694259
...	...	...
13673	Bon Secour	0.000013
13674	Sidney Center	0.000013
13675	Fluker	0.000013
13676	Mapleville	0.000013
13677	American Fork-Pleasant Grove	0.000013

13678 rows × 2 columns

In [13]:

```
import matplotlib.pyplot as plt
import seaborn as sns

# Assuming you have a DataFrame 'cities' with columns 'City' and 'AccidentRate'
plt.figure(figsize=(12, 6))

# Use the 'viridis' colormap for a nice gradient effect
sns.barplot(x='City', y='count', data=percentage_cities_df[:15], palette='viridi

plt.title('Accident Rate by City')
plt.xlabel('City')
plt.ylabel('Accident Rate (%)')
plt.xticks(rotation=45, ha='right')

# Format y-axis as percentages
```

```
plt.tight_layout()
plt.show()
```



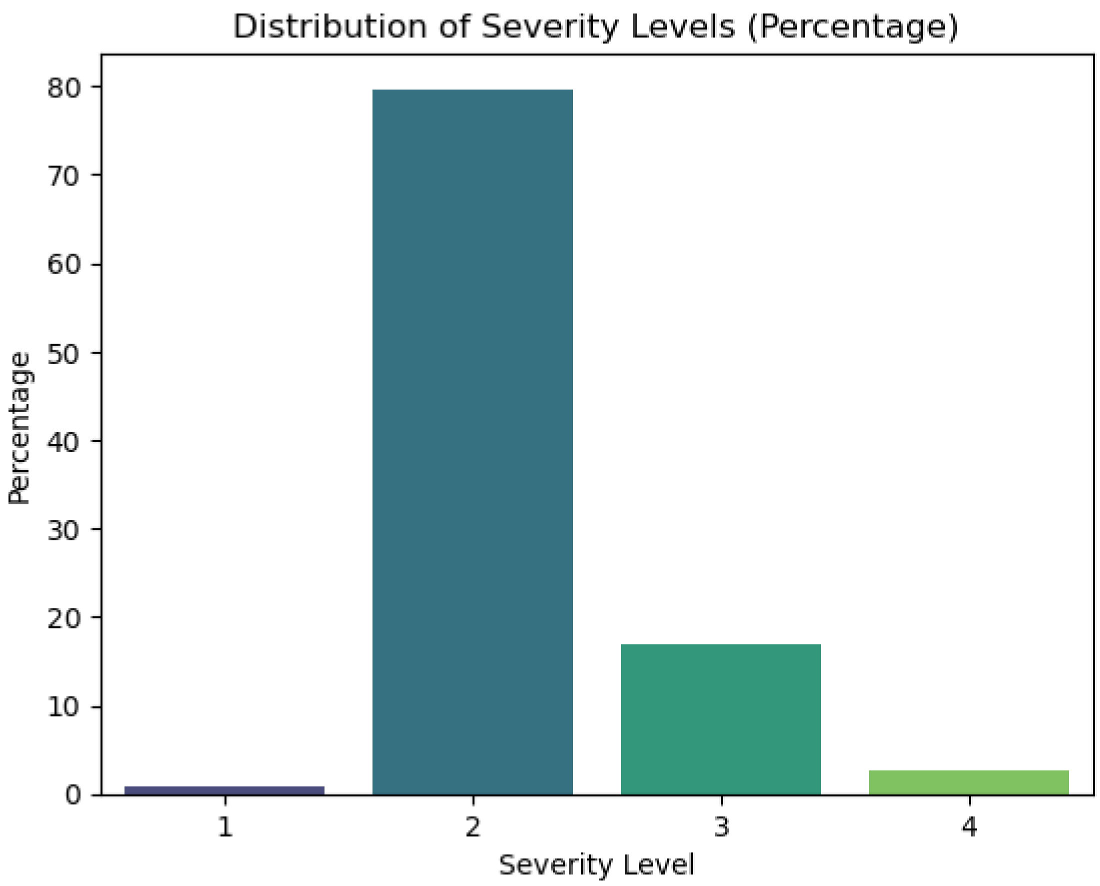
Distribution of Accidents by Severity Level

In [27]:
```
#Distribution of accidents as per the severity level
df.Severity.value_counts()
```

Out[27]:
```
Severity
2    6156981
3    1299337
4     204710
1      67366
Name: count, dtype: int64
```

Maximum number of accidents were of severity level '2'.

In [43]:
```
import seaborn as sns
import matplotlib.pyplot as plt

# Assuming df is your DataFrame
total_accidents = len(df)  # Total number of accidents in the DataFrame

# Calculate the percentage for each severity level
df['Percentage'] = df.groupby('Severity')['Severity'].transform('count') / total

# Remove duplicates after adding the Percentage column
df = df.drop_duplicates(subset=['Severity', 'Percentage'])

# Plotting
sns.barplot(x='Severity', y='Percentage', data=df, palette='viridis')
plt.xlabel('Severity Level')
plt.ylabel('Percentage')
plt.title('Distribution of Severity Levels (Percentage)')
plt.show()
```



> ***75% accidents are of severity level 2***

Impact of bumps on the rate of accidents

In [35]:

```
df_bump = df.Bump.value_counts()
df_bump
```

Out[35]:

```
Bump
False    7724880
True        3514
Name: count, dtype: int64
```

In [36]:

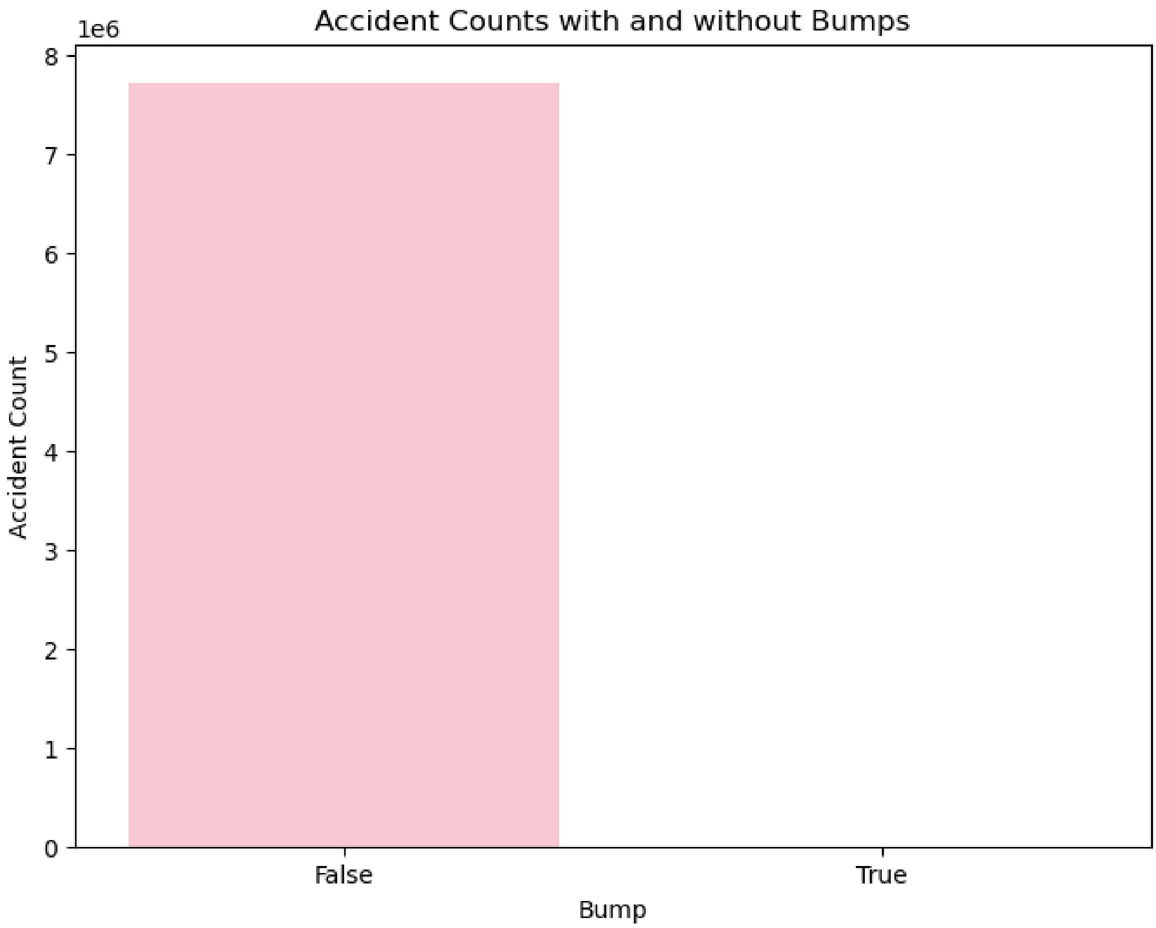
```
df_bump.reset_index()
```

Out[36]:

	Bump	count
0	False	7724880
1	True	3514

In [37]:

```
import seaborn as sns
import matplotlib.pyplot as plt

# Create a histogram using Seaborn's displot
plt.figure(figsize=(8, 6))
sns.barplot(x=df_bump.index, y=df_bump.values, palette=['pink', 'lightcoral'])
plt.xlabel('Bump')
plt.ylabel('Accident Count')
plt.title('Accident Counts with and without Bumps')
plt.show()
```



> ***Bumps do not have any major impact on the rate of accidents.***

Most severe accidents:

In [38]:
```
severe_df = df[df['Severity'] == 4]
severe_df
```

Out[38]:

	ID	Source	Severity	Start_Time	End_Time	Start_Lat	Start_Lng	Er
619	A-620	Source2	4	2016-03-11 13:18:48	2016-03-11 13:48:48	39.917412	-83.014236	
1197	A-1198	Source2	4	2016-06-24 22:28:49	2016-06-24 22:58:49	37.321117	-121.899887	
1901	A-1902	Source2	4	2016-07-01 14:09:13	2016-07-01 14:39:13	37.630623	-122.435043	
4143	A-4144	Source2	4	2016-07-25 14:23:33	2016-07-25 15:11:13	37.339115	-121.851807	
4964	A-4965	Source2	4	2016-08-01 07:44:37	2016-08-01 08:29:37	37.710648	-122.166687	
...	...	...	...	...	...	...	...	
7728354	A-7777722	Source1	4	2019-08-23 17:25:12	2019-08-23 17:54:00	38.995930	-121.672020	39
7728355	A-7777723	Source1	4	2019-08-23 17:25:12	2019-08-23 17:54:00	39.003170	-121.662679	38
7728366	A-7777734	Source1	4	2019-08-23 13:39:48	2019-08-23 14:05:33	33.685990	-117.886260	33
7728367	A-7777735	Source1	4	2019-08-23 13:39:48	2019-08-23 14:05:33	33.687300	-117.890190	33
7728380	A-7777748	Source1	4	2019-08-23 16:51:29	2019-08-23 17:21:02	33.779130	-117.887980	33

204710 rows × 46 columns

In [39]:

```
severe_cities = severe_df.City.value_counts().sort_values(ascending=False)
severe_cities
```

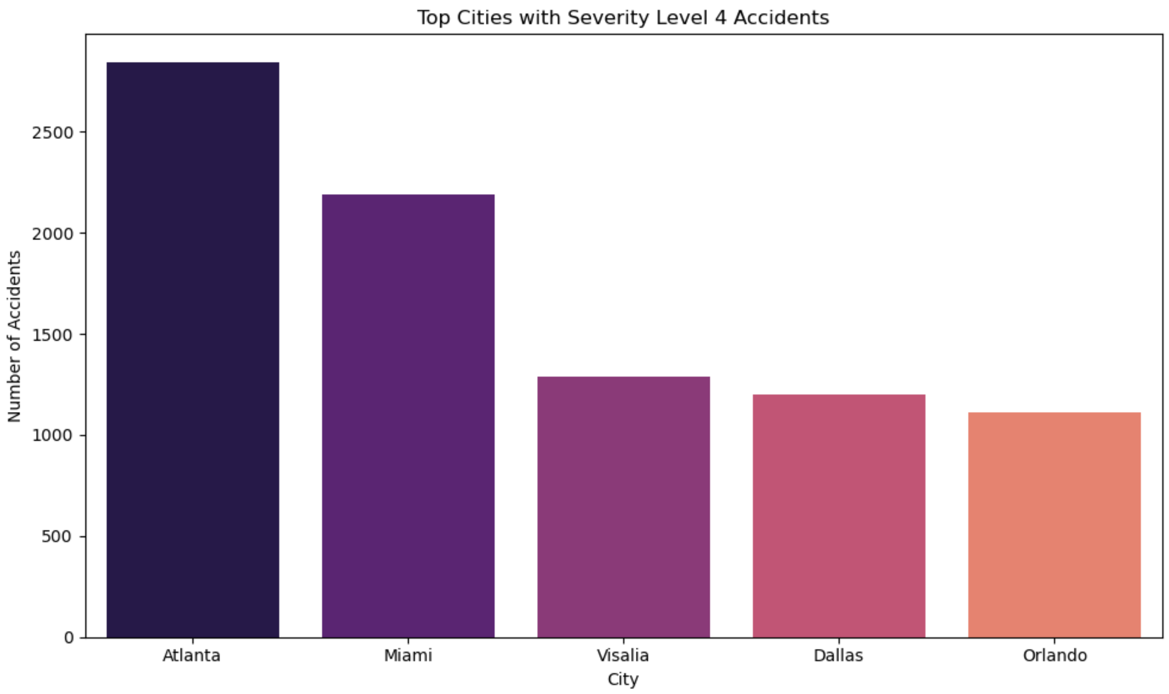
Out[39]:

```
City
Atlanta             2841
Miami               2192
Visalia             1286
Dallas              1199
Orlando             1114
                    ...
Dammeron Valley        1
Emden                  1
San Ardo               1
Warner Springs         1
Upper Falls            1
Name: count, Length: 9756, dtype: int64
```

> ***The highest number of level 4 severe accidents took place in Atlanta city followed by Miami.***

In [40]:

```python
# Top 5 cities with highest number of severe accidents

import matplotlib.pyplot as plt
import seaborn as sns

# Assuming you have a DataFrame 'severe_df' with columns 'City' and 'Severity'
severe_cities = severe_df.City.value_counts().sort_values(ascending=False)

# Get the top 5 cities and their counts
top_cities = severe_cities[:5]

# Set a better color palette
sns.set_palette("magma")

# Create a bar plot
plt.figure(figsize=(10, 6))
sns.barplot(x=top_cities.index, y=top_cities.values)
plt.title('Top Cities with Severity Level 4 Accidents')
plt.xlabel('City')
plt.ylabel('Number of Accidents')

plt.tight_layout()
plt.show()
```



Impact of weather conditions on the number of accidents

In [41]:
```
# Affect of weather condition of the rate of accidents:

df['Weather_Condition'].value_counts().sort_values(ascending=False)
```

Out[41]:
```
Weather_Condition
Fair                             2560802
Mostly Cloudy                    1016195
Cloudy                            817082
Clear                             808743
Partly Cloudy                     698972
                                   ...  
Dust Whirls                            1
Heavy Freezing Rain / Windy            1
Partial Fog / Windy                    1
Heavy Smoke                            1
Drifting Snow                          1
Name: count, Length: 144, dtype: int64
```

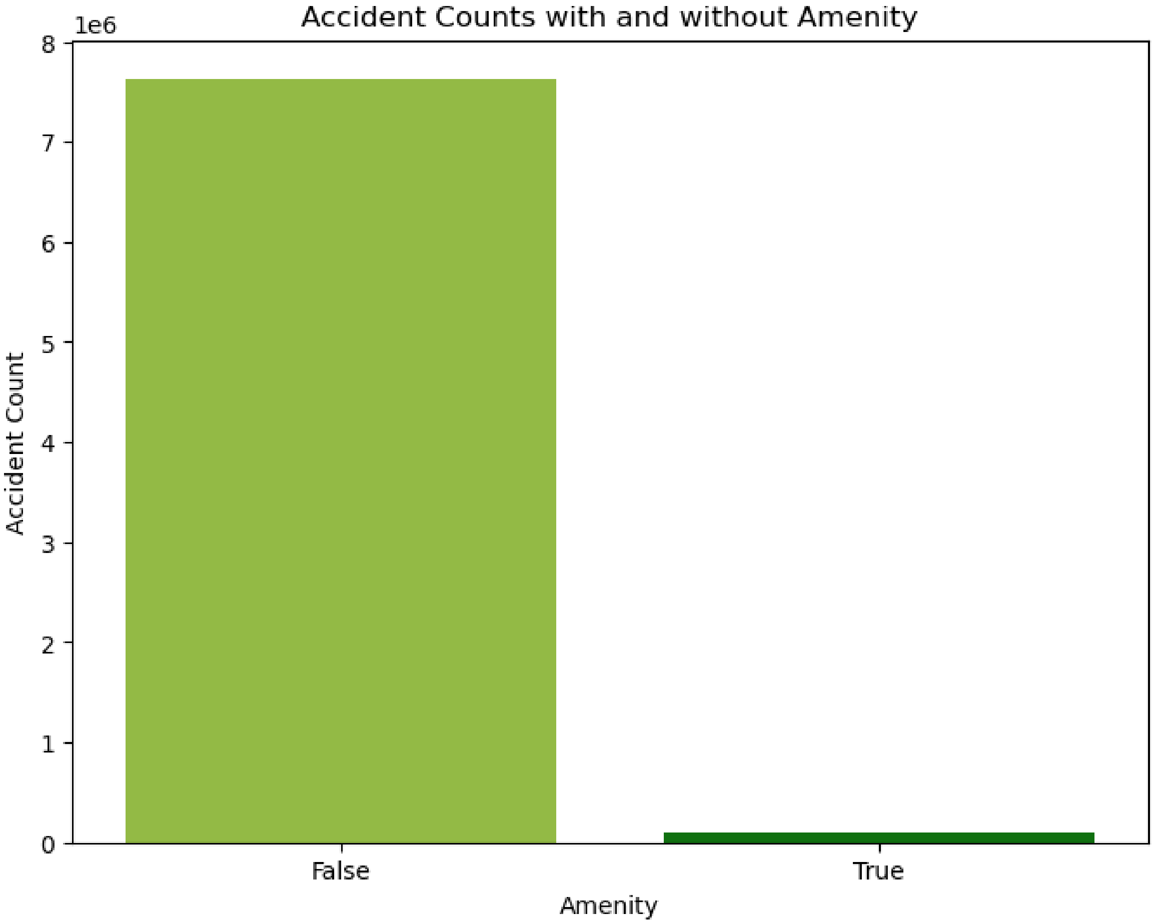
> ***Most accidents took place on a fair weather day which conveys that the reason behind the accident was something else. But conisderable number of accidents took place on a cloudy day too.***

Impact of Amenity on the number of accidents

In [42]:
```
df_Amenity = df.Amenity.value_counts()
df_Amenity
```

```
Out[42]: Amenity
         False    7632060
         True       96334
         Name: count, dtype: int64
```

```
In [44]: import seaborn as sns
         import matplotlib.pyplot as plt

         # Create a histogram using Seaborn's displot
         plt.figure(figsize=(8, 6))
         sns.barplot(x=df_Amenity.index, y=df_Amenity.values, palette=['yellowgreen', 'gr
         plt.xlabel('Amenity')
         plt.ylabel('Accident Count')
         plt.title('Accident Counts with and without Amenity')
         plt.show()
```



> ***Amenity do not have any major impact on the accident rate.***

Trend of accident rate daily, weekly and monthly

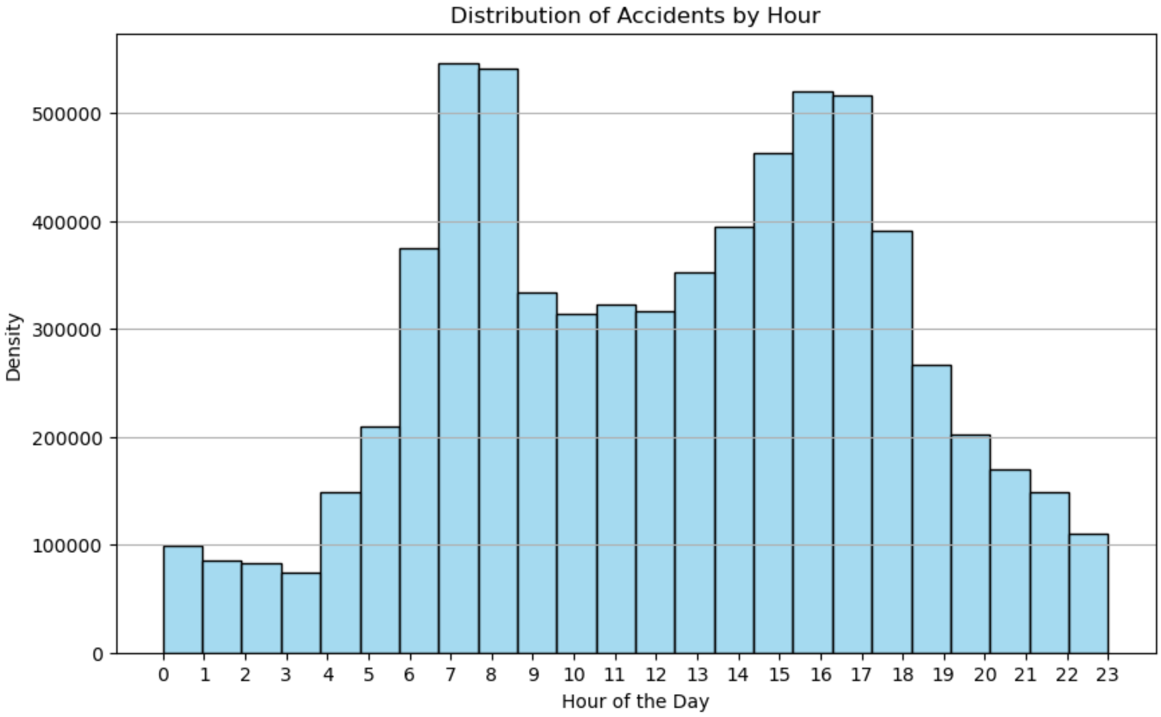
```
In [14]: df.Start_Time = pd.to_datetime(df['Start_Time'], errors='coerce')
         df.Start_Time
```

```
Out[14]: 0         2016-02-08 05:46:00
         1         2016-02-08 06:07:59
         2         2016-02-08 06:49:27
         3         2016-02-08 07:23:34
         4         2016-02-08 07:39:07
                           ...
         7728389   2019-08-23 18:03:25
         7728390   2019-08-23 19:11:30
         7728391   2019-08-23 19:00:21
         7728392   2019-08-23 19:00:21
         7728393   2019-08-23 18:52:06
         Name: Start_Time, Length: 7728394, dtype: datetime64[ns]
```

```
In [56]: print(df.Start_Time.dt.hour)  ##Extracting hour from the time
```

```
0           5.0
1           6.0
2           6.0
3           7.0
4           7.0
           ...
7728389    18.0
7728390    19.0
7728391    19.0
7728392    19.0
7728393    18.0
Name: Start_Time, Length: 7728394, dtype: float64
```

```
In [20]: import seaborn as sns
         import matplotlib.pyplot as plt

         # Assuming df is your DataFrame containing the accident data
         hourly_accidents = df['Start_Time'].dt.hour

         # Plotting the number of accidents by hour using a distplot
         plt.figure(figsize=(10, 6))
         sns.histplot(hourly_accidents, bins=24, color='skyblue')
         plt.title('Distribution of Accidents by Hour')
         plt.xlabel('Hour of the Day')
         plt.ylabel('Density')
         plt.xticks(range(24))
         plt.grid(axis='y')
         plt.show()
```



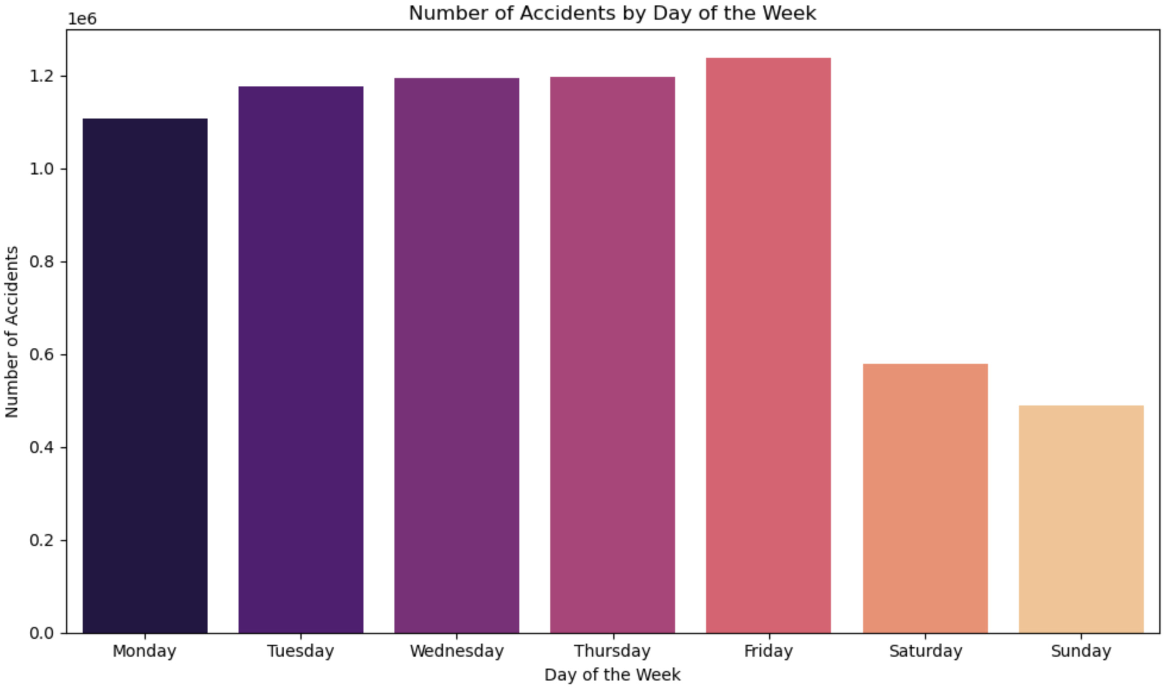
> ***The maximum number of accidents take place between 7 am to 9 am in the morning and 2pm to 5pm in the evening (Office hours).***

In [58]:
```
# Assuming 'Start_Time' has been converted to datetime
df['Start_Time'] = pd.to_datetime(df['Start_Time'], errors='coerce')

# Extract and format the day of the week
df['Day_of_Week'] = df['Start_Time'].dt.strftime('%A')

# Display the DataFrame with the new 'Day_of_Week' column
print(df[['Start_Time', 'Day_of_Week']])
```

```
                 Start_Time Day_of_Week
0       2016-02-08 05:46:00      Monday
1       2016-02-08 06:07:59      Monday
2       2016-02-08 06:49:27      Monday
3       2016-02-08 07:23:34      Monday
4       2016-02-08 07:39:07      Monday
...                     ...         ...
7728389 2019-08-23 18:03:25      Friday
7728390 2019-08-23 19:11:30      Friday
7728391 2019-08-23 19:00:21      Friday
7728392 2019-08-23 19:00:21      Friday
7728393 2019-08-23 18:52:06      Friday

[7728394 rows x 2 columns]
```

In [64]:
```
import seaborn as sns
import matplotlib.pyplot as plt

# Assuming 'Start_Time' has been converted to datetime
df['Start_Time'] = pd.to_datetime(df['Start_Time'], errors='coerce')

# Extract the day of the week
df['Day_of_Week'] = df['Start_Time'].dt.strftime('%A')
```

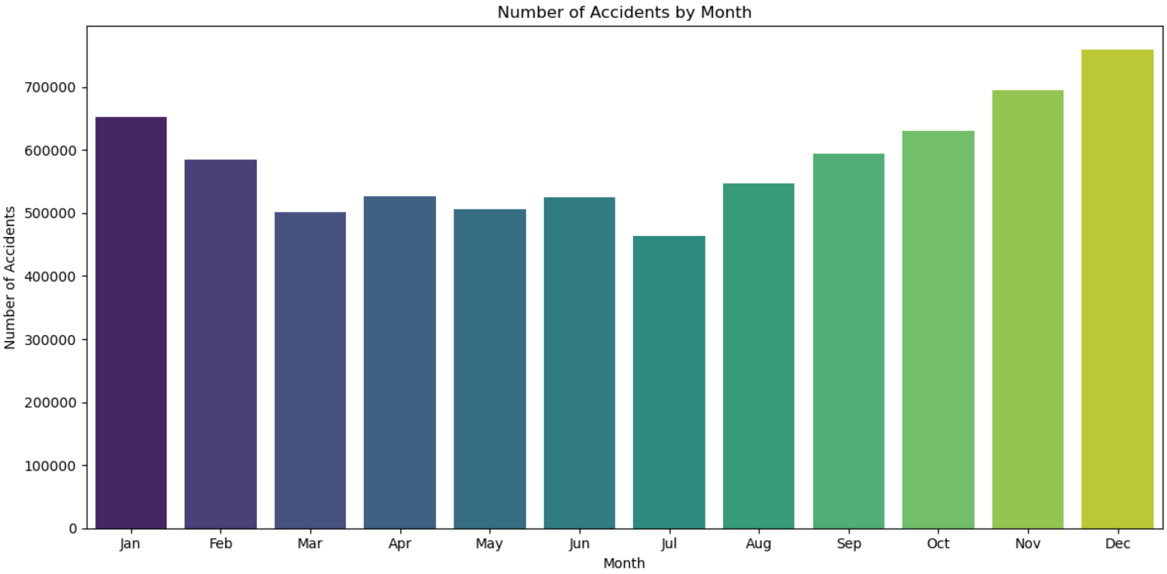
```
# Create a bar plot
plt.figure(figsize=(10, 6))
sns.countplot(x='Day_of_Week', data=df, order=['Monday', 'Tuesday', 'Wednesday',
plt.title('Number of Accidents by Day of the Week')
plt.xlabel('Day of the Week')
plt.ylabel('Number of Accidents')

plt.tight_layout()
plt.show()
```



> ***Weekdays had the consisent rate of accidents. Weekends have comparatively lower rate of accidents,***

In [60]:

```
import seaborn as sns
import matplotlib.pyplot as plt
import calendar

# Assuming 'Start_Time' has been converted to datetime
df['Start_Time'] = pd.to_datetime(df['Start_Time'], errors='coerce')

# Extract the month
df['Month'] = df['Start_Time'].dt.month

# Convert 'Month' column to integers (handle NaN values)
df['Month'] = df['Month'].astype('Int64')

# Replace NaN values with a default value (e.g., 0)
df['Month'] = df['Month'].fillna(0)

# Map month numbers to month names
df['Month'] = df['Month'].apply(lambda x: calendar.month_abbr[int(x)] if x != 0

# Create a bar plot for the number of accidents by month
plt.figure(figsize=(12, 6))
sns.countplot(x='Month', data=df, order=calendar.month_abbr[1:], palette='viridi
plt.title('Number of Accidents by Month')
plt.xlabel('Month')
plt.ylabel('Number of Accidents')

plt.tight_layout()
plt.show()
```

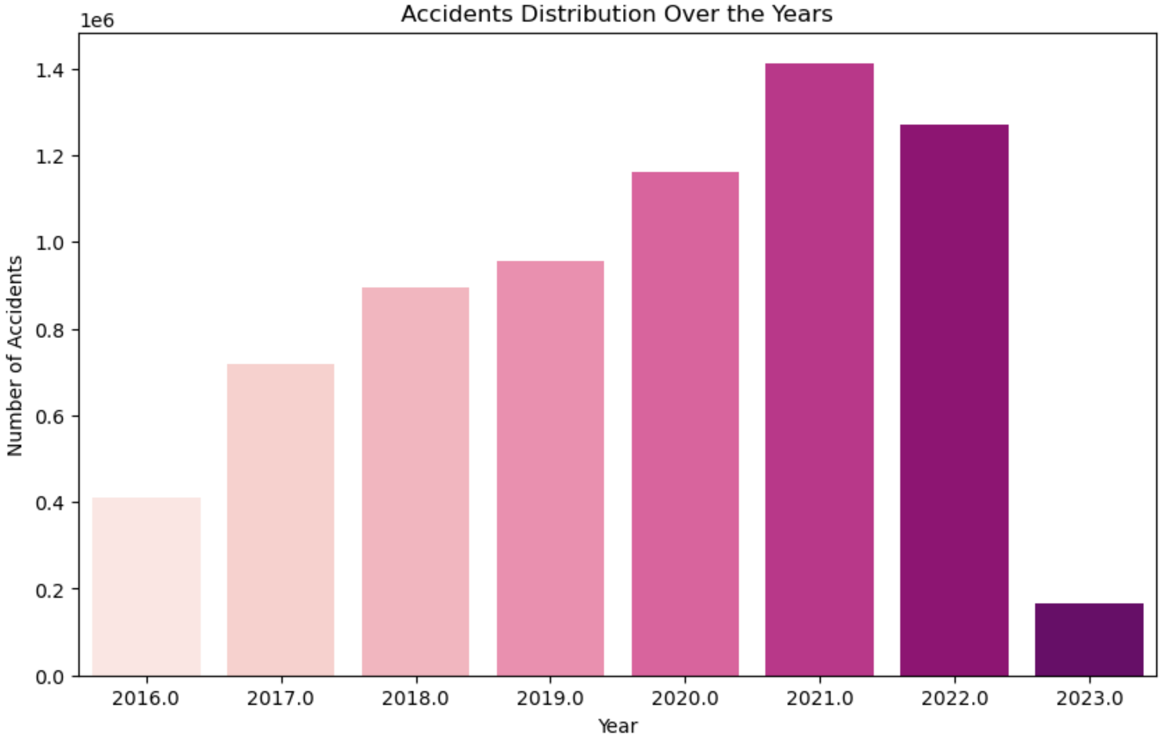


> ***December had the most number of accidents.***

In [65]:
```
df['Year'] = df['Start_Time'].dt.year
df['Year']
```

Out[65]:
```
0          2016.0
1          2016.0
2          2016.0
3          2016.0
4          2016.0
            ...  
7728389    2019.0
7728390    2019.0
7728391    2019.0
7728392    2019.0
7728393    2019.0
Name: Year, Length: 7728394, dtype: float64
```

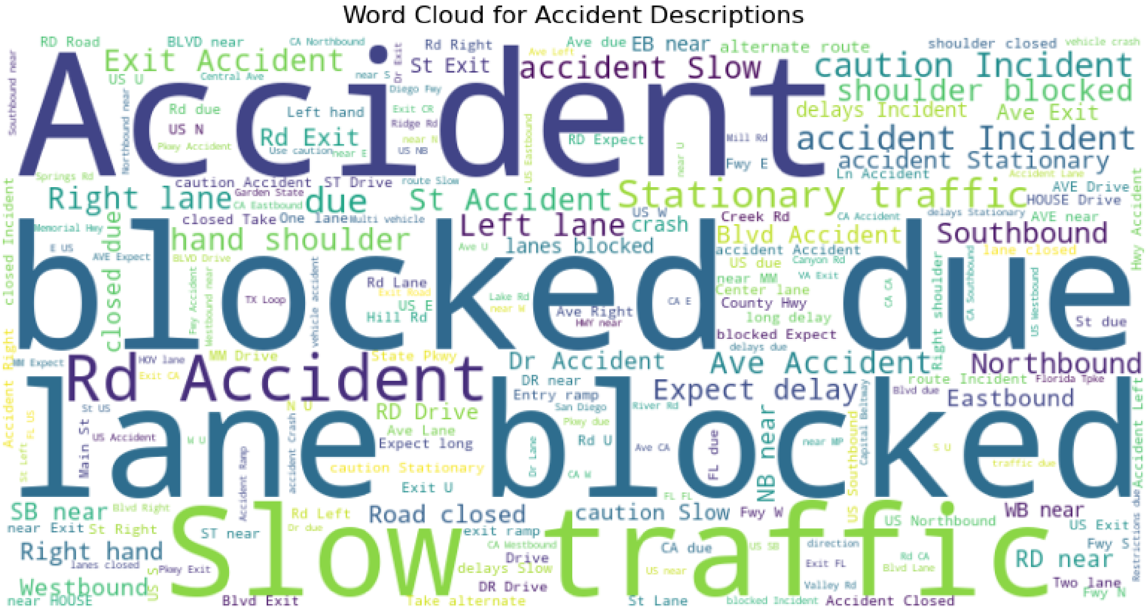
In [66]:
```
import matplotlib.pyplot as plt
import seaborn as sns

# Assuming df is your DataFrame with the 'Year' column
plt.figure(figsize=(10, 6))
sns.countplot(x='Year', data=df, palette='RdPu')
plt.xlabel('Year')
plt.ylabel('Number of Accidents')
plt.title('Accidents Distribution Over the Years')
plt.show()
```



> ***2021 had the highest number of accidents***

> ***The number of accidents have increased over the years.***

In [11]:
```
from wordcloud import WordCloud
import matplotlib.pyplot as plt

# Concatenate all descriptions into a single string
text = ' '.join(df['Description'].dropna())

# Generate a word cloud
wordcloud = WordCloud(width=800, height=400, max_words=200, background_color='wh

# Display the generated word cloud using matplotlib
plt.figure(figsize=(10, 5))
plt.imshow(wordcloud, interpolation='bilinear')
plt.axis('off')
plt.title('Word Cloud for Accident Descriptions')
plt.show()
```



```
In [ ]: # Assuming you have a DataFrame 'df' with columns 'Visibility(mi)' and 'Severity
        plt.figure(figsize=(12, 6))
        sns.scatterplot(x='Visibility(mi)', y='ID', data=df, alpha=0.1, color='blue')
        plt.title('Accident Rate vs Visibility')
        plt.xlabel('Visibility (mi)')
        plt.ylabel('Severity')
        plt.show()
```

Distribution of accidents state wise:

```
In [4]: #Which state had the max number of accidents?
        df.State.value_counts().sort_values(ascending=False)
```

Out[4]:

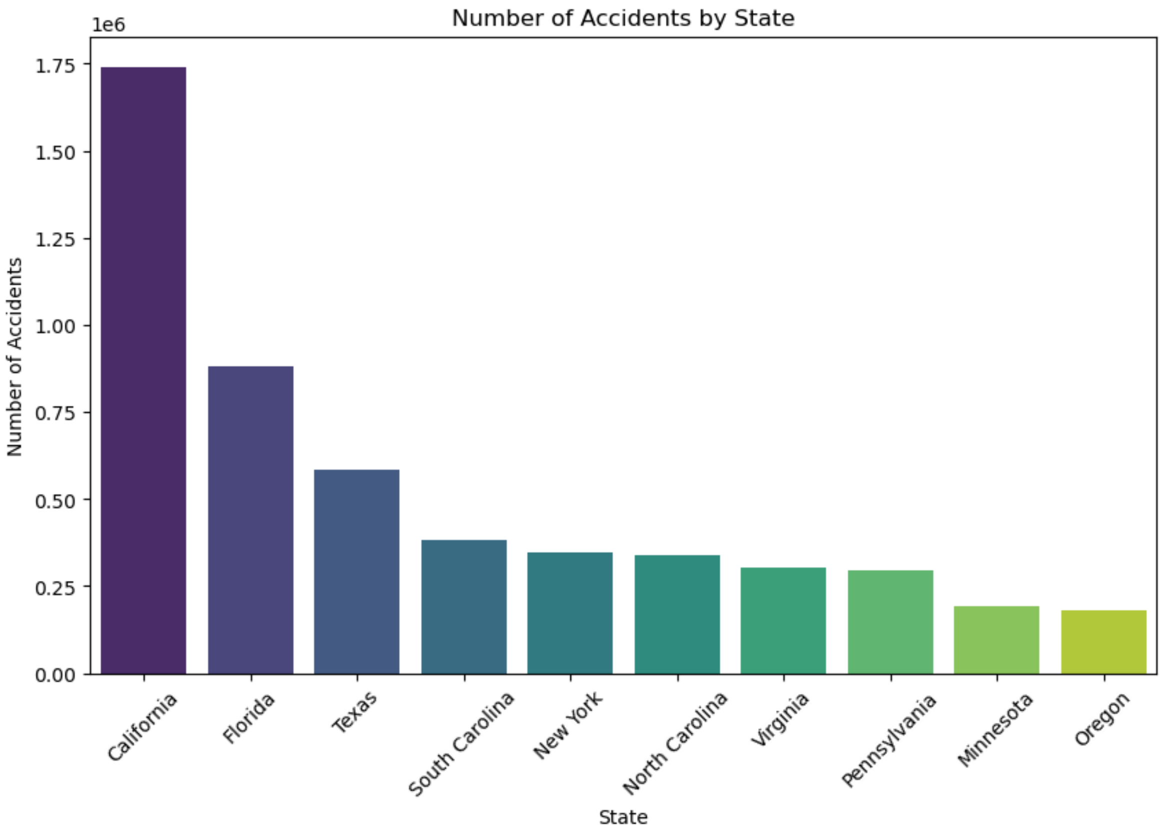
```
State
CA    1741433
FL     880192
TX     582837
SC     382557
NY     347960
NC     338199
VA     303301
PA     296620
MN     192084
OR     179660
AZ     170609
GA     169234
IL     168958
TN     167388
MI     162191
LA     149701
NJ     140719
MD     140417
OH     118115
WA     108221
AL     101044
UT      97079
CO      90885
OK      83647
MO      77323
CT      71005
IN      67224
MA      61996
WI      34688
KY      32254
NE      28870
MT      28496
IA      26307
AR      22780
NV      21665
KS      20992
DC      18630
RI      16971
MS      15181
DE      14097
WV      13793
ID      11376
NM      10325
NH      10213
WY       3757
ND       3487
ME       2698
VT        926
SD        289
Name: count, dtype: int64
```

In [10]:

```
#State code maaping:

state_code_mapping = {
    'AL': 'Alabama',
    'AK': 'Alaska',
    'AZ': 'Arizona',
    'AR': 'Arkansas',
    'CA': 'California',
    'CO': 'Colorado',
    'CT': 'Connecticut',
    'DE': 'Delaware',
    'FL': 'Florida',
    'GA': 'Georgia',
    'HI': 'Hawaii',
    'ID': 'Idaho',
    'IL': 'Illinois',
    'IN': 'Indiana',
    'IA': 'Iowa',
    'KS': 'Kansas',
    'KY': 'Kentucky',
    'LA': 'Louisiana',
    'ME': 'Maine',
    'MD': 'Maryland',
    'MA': 'Massachusetts',
    'MI': 'Michigan',
    'MN': 'Minnesota',
    'MS': 'Mississippi',
    'MO': 'Missouri',
    'MT': 'Montana',
    'NE': 'Nebraska',
    'NV': 'Nevada',
    'NH': 'New Hampshire',
    'NJ': 'New Jersey',
    'NM': 'New Mexico',
    'NY': 'New York',
    'NC': 'North Carolina',
    'ND': 'North Dakota',
    'OH': 'Ohio',
    'OK': 'Oklahoma',
    'OR': 'Oregon',
    'PA': 'Pennsylvania',
    'RI': 'Rhode Island',
    'SC': 'South Carolina',
    'SD': 'South Dakota',
    'TN': 'Tennessee',
    'TX': 'Texas',
    'UT': 'Utah',
    'VT': 'Vermont',
    'VA': 'Virginia',
    'WA': 'Washington',
    'WV': 'West Virginia',
    'WI': 'Wisconsin',
    'WY': 'Wyoming'
}

df['state_name'] = df['State'].map(state_code_mapping)
```

In [11]:

```
import matplotlib.pyplot as plt
import seaborn as sns

state_counts = df['state_name'].value_counts().sort_values(ascending=False)[:10]
plt.figure(figsize=(10, 6))
sns.barplot(x=state_counts.index, y=state_counts.values, palette='viridis')
plt.title('Number of Accidents by State')
plt.xlabel('State')
plt.ylabel('Number of Accidents')
plt.xticks(rotation=45)
plt.show()
```



> ***California state had the maximum number of accidents***

In [18]:

```
import pandas as pd

# Assuming df is your DataFrame
df['Start_Time'] = pd.to_datetime(df['Start_Time'], errors='coerce')  # Correcte

# Group by date and calculate the average
average_accidents_per_day = df.groupby(df['Start_Time'].dt.date).size().mean()

# Round to the nearest integer
rounded_average_accidents_per_day = round(average_accidents_per_day)

print(f'Average number of accidents per day (rounded): {rounded_average_accident
```

```
Average number of accidents per day (rounded): 2718
```

> ***Average number of accidents per day : 2718***

In [28]:

```
#Number of accidents daily in california

# Assuming df is your DataFrame*count the number of accidents
daily_accidents_california = round(california_df.groupby(california_df['Start_Ti

print(f'Average number of daily accidents in California:\n{daily_accidents_calif
```

```
Average number of daily accidents in California:
627
```

In [29]:

```
#Which city has the lowest number of accidents?

df.state_name.value_counts().sort_values(ascending=True)[:1]
```

Out[29]:

```
state_name
South Dakota    289
Name: count, dtype: int64
```

> ***South Dakota state had the minimum number of accidents.***

In [38]:

```
#Average number of daily road accidents in SD

# Assuming df is your DataFrame
df['Start_Time'] = pd.to_datetime(df['Start_Time'], errors='coerce')  # Correcte

# Filter for California
dakota_df = df[df['State'] == 'SD']

# Group by date and count the number of accidents
daily_accidents_dakota = round(dakota_df.groupby(dakota_df['Start_Time'].dt.date

print(f'Average number of daily accidents in South Dakota:\n{daily_accidents_dak
```

```
Average number of daily accidents in South Dakota:
3
```