```
import pandas as pd
In [1]:
          import matplotlib.pyplot as plt
          import seaborn as sns
          import plotly.express as px
          df = pd.read csv("US Accidents March23.csv")
In [4]:
          df
                        ID
                            Source Severity Start Time End Time
                                                                   Start Lat
                                                                               Start Lng
                                                                                         End Lat
                                                                                                    En
Out[4]:
                                                         2016-02-
                                             2016-02-08
                0
                           Source2
                                          3
                                                               80
                                                                   39.865147
                                                                              -84.058723
                                                                                             NaN
                                               05:46:00
                                                          11:00:00
                                                         2016-02-
                                             2016-02-08
                1
                       A-2 Source2
                                                              08
                                                                   39.928059
                                                                              -82.831184
                                                                                             NaN
                                               06:07:59
                                                          06:37:59
                                                         2016-02-
                                             2016-02-08
                2
                       A-3 Source2
                                                              80
                                                                  39.063148
                                                                              -84.032608
                                                                                             NaN
                                               06:49:27
                                                          07:19:27
                                                         2016-02-
                                             2016-02-08
                3
                          Source2
                                                              80
                                                                  39.747753
                                                                              -84.205582
                                                                                             NaN
                                               07:23:34
                                                          07:53:34
                                                          2016-02-
                                             2016-02-08
                4
                       A-5 Source2
                                                              80
                                                                  39.627781
                                                                              -84.188354
                                                                                             NaN
                                               07:39:07
                                                          08:09:07
                                                         2019-08-
                                             2019-08-23
          7728389
                           Source1
                                                              23
                                                                  34.002480 -117.379360 33.99888 -117.
                  7777757
                                               18:03:25
                                                          18:32:01
                                                         2019-08-
                                             2019-08-23
          7728390
                           Source1
                                                              23
                                                                  32.766960 -117.148060 32.76555 -117.
                  7777758
                                               19:11:30
                                                          19:38:23
                                                         2019-08-
                                             2019-08-23
          7728391
                           Source1
                                                               23
                                                                  33.775450 -117.847790 33.77740 -117.
                  7777759
                                               19:00:21
                                                          19:28:49
                                                         2019-08-
                                             2019-08-23
          7728392
                           Source1
                                                              23
                                                                   33.992460 -118.403020 33.98311 -118.
                  7777760
                                               19:00:21
                                                          19:29:42
                                                         2019-08-
                                             2019-08-23
          7728393
                           Source1
                                                              23
                                                                  34.133930 -117.230920 34.13736 -117.
                  7777761
                                               18:52:06
                                                          19:21:31
         7728394 rows × 46 columns
In [5]:
          print(df.head())
          print(df.info())
              ID
                    Source Severity
                                                    Start_Time
                                                                               End Time \
          0
             A-1
                   Source2
                                      3
                                         2016-02-08 05:46:00
                                                                  2016-02-08 11:00:00
          1
                   Source2
                                         2016-02-08 06:07:59
                                                                  2016-02-08 06:37:59
             A-2
                                      2
          2
             A-3
                   Source2
                                         2016-02-08 06:49:27
                                                                  2016-02-08 07:19:27
          3
             A-4
                   Source2
                                      3
                                         2016-02-08 07:23:34
                                                                  2016-02-08 07:53:34
                                         2016-02-08 07:39:07
                                                                  2016-02-08 08:09:07
             A-5
                                      2
                   Source2
```

```
Start Lat Start_Lng
                                                            ... Roundabout
                          End Lat
                                    End Lng
                                             Distance(mi)
0
   39.865147 -84.058723
                              NaN
                                        NaN
                                                      0.01
                                                                      False
                                                             . . .
1
  39.928059 -82.831184
                              NaN
                                        NaN
                                                      0.01
                                                                      False
                                                             . . .
2
   39.063148 -84.032608
                              NaN
                                        NaN
                                                      0.01
                                                                      False
                                                             . . .
3
  39.747753 -84.205582
                              NaN
                                        NaN
                                                      0.01
                                                                      False
                                                             . . .
4
   39.627781 -84.188354
                              NaN
                                        NaN
                                                      0.01
                                                                      False
                                                             . . .
            Stop Traffic Calming Traffic Signal Turning Loop Sunrise Sunset
  Station
0
    False
                            False
                                            False
                                                          False
                                                                          Niaht
1
    False False
                            False
                                            False
                                                          False
                                                                          Night
2
    False
          False
                            False
                                             True
                                                          False
                                                                          Night
3
    False False
                            False
                                            False
                                                          False
                                                                          Night
4
    False False
                            False
                                              True
                                                          False
                                                                             Day
  Civil Twilight Nautical Twilight Astronomical Twilight
0
           Niaht
                              Niaht
                                                      Niaht
                                                        Day
1
           Night
                              Niaht
2
           Niaht
                                 Dav
                                                        Dav
3
             Day
                                 Day
                                                        Day
4
             Day
                                 Day
                                                        Day
[5 rows x 46 columns]
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 7728394 entries, 0 to 7728393
Data columns (total 46 columns):
#
     Column
                             Dtype
- - -
     -----
0
     TD
                              object
 1
     Source
                              object
 2
     Severity
                              int64
 3
     Start Time
                              object
 4
     End Time
                              object
 5
                              float64
     Start Lat
 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
     Weather Timestamp
 19
                              obiect
 20
     Temperature(F)
                              float64
 21
     Wind Chill(F)
                              float64
 22
     Humidity(%)
                              float64
    Pressure(in)
 23
                              float64
 24
     Visibility(mi)
                              float64
 25
     Wind Direction
                              object
 26
     Wind_Speed(mph)
                              float64
 27
     Precipitation(in)
                              float64
 28
     Weather Condition
                              object
    Amenity
 29
                              bool
30
    Bump
                             bool
 31
     Crossina
                              bool
 32
     Give Way
                              bool
 33
     Junction
                              bool
     No Exit
                              bool
```

```
35
             Railway
                                     bool
         36
             Roundabout
                                     bool
         37
             Station
                                     bool
         38
             Stop
                                     bool
             Traffic Calming
         39
                                     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
        None
        print(df['Start Time'].head())
In [6]:
             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
             2016-02-08 07:39:07
        Name: Start Time, dtype: object
In [7]: df['Start Time'] = pd.to datetime(df['Start Time'], errors='coerce')
        print(df[df['Start Time'].isna()])
In [8]:
                                      Severity Start Time
                              Source
        3639775
                 A-3649658
                             Source1
                                              2
                                                       NaT
        3639776
                 A-3649659
                             Source1
                                              4
                                                       NaT
                                              3
        3639777
                 A-3649660
                             Source1
                                                       NaT
        3639778
                 A-3649661
                             Source1
                                              3
                                                       NaT
                 A-3649662 Source1
                                              3
        3639779
                                                       NaT
        6834080
                 A-6883265
                                              2
                             Source1
                                                       NaT
                                              2
        6834081
                 A-6883266
                             Source1
                                                       NaT
        6834082
                 A-6883267
                             Source1
                                              2
                                                       NaT
                                              2
        6834083
                 A-6883268
                            Source1
                                                       NaT
                                              2
        6834084
                 A-6883269
                             Source1
                                                       NaT
                                        End Time
                                                  Start Lat
                                                                            End Lat
                                                              Start Lng
        3639775
                 2017-07-23 10:21:01.000000000
                                                  34.062650 -118.000680
                                                                          34.061940
        3639776
                 2017-07-23 11:18:46.000000000
                                                  33.931460 -118.390730
                                                                          33.931530
        3639777
                 2017-07-23 11:36:01.000000000
                                                  33.617890 -117.711160
                                                                          33.611590
        3639778
                 2017-07-23 14:36:01.000000000
                                                  33.697590 -117.940060
                                                                          33.695730
        3639779
                 2017-07-23 17:02:16.000000000
                                                  34.035340 -118.329820
                                                                         34.034960
                 2020-11-24 05:07:29.000000000
        6834080
                                                  25.943633
                                                              -80.205311
                                                                          25.942485
        6834081
                 2020-11-19 19:58:52.000000000
                                                  39.974916
                                                             -75.341137
                                                                          40.036633
        6834082 2020-11-03 18:47:44.000000000
                                                  29.831816
                                                             -95.567133
                                                                          29.831840
        6834083
                 2020-11-17 02:44:13.000000000
                                                  46.556711
                                                             -92.603733
                                                                          46.562231
        6834084
                 2020-11-25 04:07:32.000000000
                                                  38.566700 -121.504014
                                                                          38.567670
                     End Lng
                              Distance(mi)
                                             ... Roundabout Station
                                                                       Stop
        3639775 -118.000700
                                     0.049
                                                      False
                                                              False False
                                             . . .
                                     0.590
        3639776 -118.401020
                                                      False
                                                              False False
                                             . . .
        3639777 -117.704200
                                     0.591
                                                      False
                                                              False
                                                                     False
                                             . . .
                                                                      False
        3639778 -117.935590
                                     0.287
                                                      False
                                                              False
        3639779 -118.337590
                                     0.446
                                             . . .
                                                      False
                                                              False
                                                                      False
                                                        . . .
                                        . . .
                                             . . .
                                                                 . . .
        . . .
                         . . .
                                                                        . . .
        6834080
                 -80.204455
                                     0.095
                                                      False
                                                              False
                                                                      False
```

```
4.331
         6834081
                  -75.355487
                                                       False
                                                               False False
                                             . . .
                                                      False
                                                               False False
         6834082 -95.565826
                                      0.078
         6834083 -92.595371
                                      0.551
                                              . . .
                                                      False
                                                               False False
         6834084 -121.506734
                                      0.162
                                                      False
                                                               False False
                                             . . .
                 Traffic Calming Traffic Signal Turning Loop Sunrise Sunset \
                                           False
         3639775
                            False
                                                        False
                                                                        Niaht
                            False
                                           False
                                                        False
         3639776
                                                                        Night
         3639777
                            False
                                           False
                                                         False
                                                                        Night
                            False
                                           False
                                                         False
         3639778
                                                                          Day
         3639779
                            False
                                           False
                                                        False
                                                                          Day
         . . .
                              . . .
                                             . . .
                                                          . . .
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         6834080
                            False
                                           False
                                                         False
                                                                          Day
                                           False
         6834081
                            False
                                                         False
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         6834082
                            False
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                                                         False
                                                                          Day
         6834083
                                                         False
                                                                        Night
                            False
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         6834084
                            False
                                           False
                                                         False
                                                                        Night
                  Civil Twilight Nautical Twilight Astronomical Twilight
         3639775
                           Night
                                             Night
                           Night
         3639776
                                               Day
                                                                      Day
         3639777
                             Day
                                                                      Day
                                               Day
         3639778
                             Day
                                               Day
                                                                      Day
         3639779
                                                                      Day
                             Day
                                               Day
                                                                      . . .
         6834080
                             Day
                                               Day
                                                                      Day
         6834081
                           Niaht
                                             Niaht
                                                                      Day
         6834082
                                                                      Day
                             Day
                                               Day
         6834083
                           Night
                                             Niaht
                                                                    Night
         6834084
                           Night
                                             Night
                                                                    Night
         [743166 rows x 46 columns]
 In [9]: df = df.dropna(subset=['Start Time'])
In [10]: | df['Start Time'] = pd.to datetime(df['Start Time'])
         C:\Users\vivek\AppData\Local\Temp\ipykernel 4296\2394841556.py:1: SettingWithC
         opyWarning:
         A value is trying to be set on a copy of a slice from a DataFrame.
         Try using .loc[row indexer,col indexer] = value instead
         See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/st
         able/user guide/indexing.html#returning-a-view-versus-a-copy
           df['Start Time'] = pd.to datetime(df['Start Time'])
         df['Hour'] = df['Start_Time'].dt.hour
In [11]:
         df['Weekday'] = df['Start Time'].dt.day name()
         C:\Users\vivek\AppData\Local\Temp\ipykernel 4296\3270295720.py:1: SettingWithC
         opyWarning:
         A value is trying to be set on a copy of a slice from a DataFrame.
         Try using .loc[row indexer,col indexer] = value instead
         See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/st
         able/user guide/indexing.html#returning-a-view-versus-a-copy
           df['Hour'] = df['Start Time'].dt.hour
         C:\Users\vivek\AppData\Local\Temp\ipykernel_4296\3270295720.py:2: SettingWithC
         opyWarning:
         A value is trying to be set on a copy of a slice from a DataFrame.
         Try using .loc[row indexer,col indexer] = value instead
```

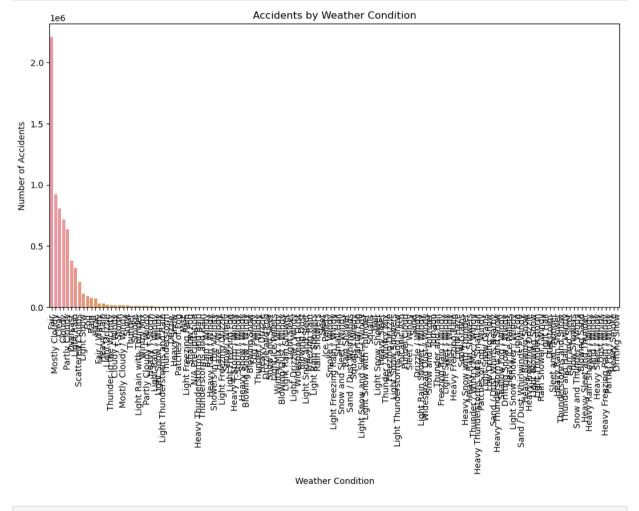
```
See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/st
able/user_guide/indexing.html#returning-a-view-versus-a-copy
df['Weekday'] = df['Start_Time'].dt.day_name()
```

```
In [12]: df['Weekday'] = df['Start_Time'].dt.day_name()

C:\Users\vivek\AppData\Local\Temp\ipykernel_4296\2272440486.py:1: SettingWithCopyWarning:
   A value is trying to be set on a copy of a slice from a DataFrame.
   Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy df['Weekday'] = df['Start_Time'].dt.day_name()
```

```
In [13]: weather_accidents = df['Weather_Condition'].value_counts().sort_values(ascendi
    plt.figure(figsize=(12,6))
    sns.barplot(x=weather_accidents.index, y=weather_accidents.values)
    plt.xticks(rotation=90)
    plt.title('Accidents by Weather Condition')
    plt.xlabel('Weather Condition')
    plt.ylabel('Number of Accidents')
    plt.show()
```



```
In [14]: print(df.columns)
```

```
'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 Twiligh
                                              t',
                                                                                  'Astronomical Twilight', 'Hour', 'Weekday'],
                                                                           dtvpe='object')
In [15]: hour weather accidents = df.groupby(['Hour', 'Weather Condition']).size().unst
                                               plt.figure(figsize=(12, 6))
                                               sns.heatmap(hour weather accidents, cmap="YlGnBu", annot=True, cbar=False)
                                               plt.title('Accidents by Hour of Day and Weather Condition')
                                              plt.xlabel('Weather Condition')
                                              plt.ylabel('Hour of Day')
                                               plt.show()
                                                                                                                                                                  Accidents by Hour of Day and Weather Condition
                                                     ○ -2/0/11<del>8/2/11883/7/823/108988831-8</del>07908863-907200043653.B0De 20 38 7408<del>66 740887861-80887861 80808687884508008096-90920886-928020009-520006-72 72706-9</del>02
                                                      ~ 1-1601328cf-160082832806-160-1700328cf-1600828364306
1-101328cf-160082832806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600806-1600808-1000808-1600808-1600808-1600808-1600808-1600808-1600808-1600808-1600808-1600808-1600808-1600808-1600808-1600808-1600808-1600808-1600808-1600808-1600808-1600808-1600808-1600808-16008-16008-16008-1600808-16008-16008-16008-16008-16008-16008-16008-16008-16008-160
                                                     m -06034<del>721488827288821:040385</del>06 96090000 1950021000 7.6 94 70900+1012 30006969.2084.9609401503020_050446<del>8685 86388892</del>47020000966+702350879946800200007 32 400003 484000666 6 0 2
                                                      $\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2}\frac{1}{2
                                                     0 -745762463334 (40 e4 757196970 1002642036666844/21550222-11657 165246246702 4056. 6612536140020360603 100064 10006666340250866254002676051264002
                                                    2 -58386 FCND : 175 0-44050 0 +75 0-06470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 18066470 180664
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                                                      -5385561f188}1(NP2+6568832; -40 N25677013807647875518894 N755-1898-5488258940012096 518867888 41186780201396-16 4882467802090168674018658218252182521902
                                                            1 ENTENDED: 382 - C2 X 15 16 4 79 ENDEO DO CONTROCTURO CONTROCTURO
                                                             -2 BINISA HISTORIA BEN-1-CHANNED G H-NOVIO DE 2-1010 2000 C 46 9-9. 906 C 305 34 140 SAC HINISAC HINIS
                                                                                                                                                                                         Light Drizzle –
Light Freezing Drizzle –
t Freezing Rain / Windy –
Light Ice Pellets –
                                                                                                                                                                                                                                                                                   Övercast –
Partly Cloudy –
Patches of Fog / Windy –
Rain Shower –
Rain and Sleet –
                                                                                                                                                                                                                                                              Light Thunderstorm –
Low Drifting Snow –
Mostly Cloudy –
                                                                                                                                                                                                                                                                                                                                                       Smoke / Windy -
Snow Grains -
v and Sleet / Windy -
                                                                                                                                     Freezing Rain / Windy
Heavy Rain / Windy
                                                                                                                                                      Heavy Rain Showers
                                                                                                                                                                   Heavy Snow / Windy
Heavy T-Storm / Windy
Heavy Thunderstorms with Small Hail
                                                                                                                                                                                                                                      Light Snow
                                                                                                                                                                                                                                                                                                                                        Showers in the Vicinity
                                                                                                                                                                                                                               Rain with Thunder
                                                                                                                                                                                                                                                                                                                                 Scattered Clouds
                                                                     Blowing Snow
                                                                                                                                                             Heavy Sleet and Thunder
                                                                                                                                                                                                                         Light Rain Shower
                                                                                                                                                                                                                                               Light Snow Shower
                                                                                                                                                                                                                                                      ight Snow and Sleet
                                                                                                                                                                                                                                                                                                                          Dust Whirlwinds
                                                                                                                                                                                                                                                                                                                                                                                                    and Hail / Windy
                                                                                                                                                                                                                                                                                                                                                                                                          Thunderstorms and Rain
                                                                                                                                                                                                                                                                                                                                                                                                     Thunder
                                                                                                                                                                                                                       Weather Condition
In [16]: sns.heatmap(hour_weather_accidents, cmap="YlGnBu", annot=True, fmt=".2f", cbar
                                             <Axes: xlabel='Weather Condition', ylabel='Hour'>
Out[16]:
```



```
2211
23399
                                               Drizzle -
                                                                                          Haze / Windy -
                                                                                                                                                                                   Light Freezing Fog -
                                                                                                                                                                                                                                Light Snow / Windy -
                                                                                                                                                                                                                                                                                                                                     Scattered Clouds -
                                                                                                                                                                                                                                                                                                                                                    Sleet / Windy -
                                                                                                                                                                                                                                                                                                                                                                                Snow and Sleet / Windy -
                                                                                                                                                                                                                                                                                                                                                                                                                               Thunderstorms and Rain -
                                                                            Freezing Rain –
                                                                                                                                       Heavy Smoke -
                                                                                                                                                    Heavy T-Storm / Windy -
                                                                                                                                                                   Light Blowing Snow -
                                                                                                                                                                                                   Light Ice Pellets -
                                                                                                                                                                                                               ight Rain Showers -
                                                                                                                                                                                                                                              Light Snow and Sleet –
                                                                                                                                                                                                                                                             Thunderstorms and Snow -
                                                                                                                                                                                                                                                                                                                        Sand -
                                                                                                                                                                                                                                                                                                                                                                     Snow -
                                                                                                                                                                                                                                                                                                                                                                                                 T-Storm -
                                                                                                                                                                                                                                                                                                                                                                                                              Thunder / Wintry Mix / Windy -
                                                                                                         Heavy Freezing Rain / Windy
                                                                                                                                                                                                                                                                                                        Rain / Windy
                 Blowing Dust
                                                                                                                        Heavy Rain Shower / Windy
                                                                                                                                                                                                                                                                            Mostly Cloudy / Windy
                                                                                                                                                                                                                                                                                          Partly Cloudy
                                                                                                                                                                                                                                                                                                                                                                                                                                              Widespread Dust / Windy
                                                                                                                                                                                                                                                             Light <sup>-</sup>
                                                                                                                                                                                  Weather_Condition
```

```
In [17]: hour_weather_accidents = df.groupby(['Hour', 'Weather_Condition']).size().unst
# Convert the grouped data to integers
hour_weather_accidents = hour_weather_accidents.astype(int)

# Plot the heatmap
plt.figure(figsize=(12, 6))
sns.heatmap(hour_weather_accidents, cmap="YlGnBu", annot=True, fmt="d", cbar=F
plt.title('Accidents by Hour of Day and Weather Condition')
plt.xlabel('Weather Condition')
plt.ylabel('Hour of Day')
plt.show()
```

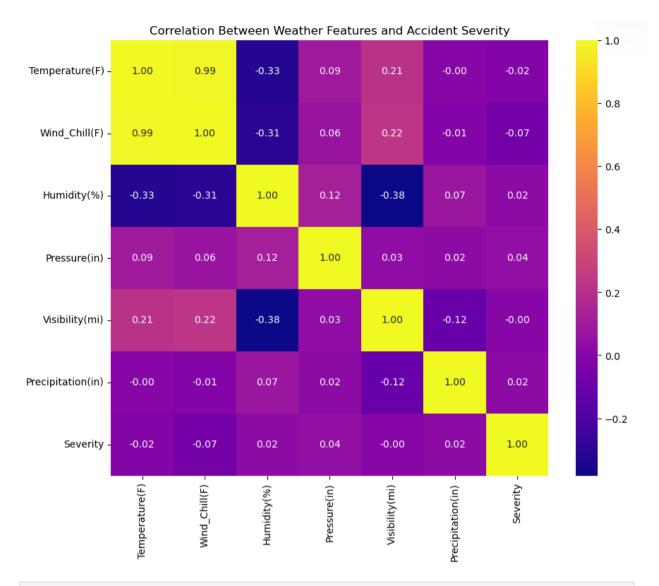


 ${\color{red} \sim -1002256468533229407036101.30031632000001.2632600009313634036994075062000001.0656202000006742075000769108000076210100265000058}$

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m -0004449003 1 2023933 2 0005 909000113001001 749 3 70009 107 3 108 56 704 456 3 100002 1 56 74 64 59 109 2 5 108 000 00 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 73 000 56 7
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                                                                6 -55448978586))152489472974 4619521000099912429036651888805946658477892 B00171120168189788847858891006020000865678-600585578081106641278902191206001191A
                                                               00 -95C32-545185 0 (3) 12 5322-52 (5) 14 C1 12 C5440000 C552 (940 612 C1 22 C4 22 C4
                                                               O -7263588212 9 7.25540 15.65 Q 30045 D005012947.25 3012 D1598301528307483398 (2 405030189485801594958 0 30000 A 2850 D49798 90 Q 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728 20058728
                                                      2 12.287755516667 (10.728705622501.601045000300354554022 00130.5360287532356502 562 01.11023592 91.7465794 20203222060311021 302 8026029753 641023 683120 1520 73013 302
                                                               9 11377H5487 H:: 143844116478:30006506009740H5 1930/662860025682402690013225251HH58278528974266000202451244931403100274H2220652H52024512
                                                                 2 1 CHARLES STATE 
                                                                        -110 685/FIRED 853/4 953 3034 B874003395000006 232245034550 B86064 PSDCESIS 8 G0000006 9 0 43565 408280 470070000237830001820470060000 31749001078 400230 0
                                                                        Poizzle and Fog - Pair - Fair - Fog / Windy - Freezing Rain / Windy - Haze - Heavy Drizzle - Heavy Freezing Rain / Windy - Heavy Rain / Windy -
                                                                                                                                                                                                                     Heavy Thunderstorms with Small Hail -
Light Preezing Drizzle -
Light Freezing Drizzle -
Light Freezing Rain / Windy -
Light Rein Shower -
Light Rain Shower -
                                                                                                                                                                                                                                                                                  Light Snow Shower Light Snow and Sleet Light Thunderstorm Low Drifting Snow Mostly Cloudy - Overcast Partly Cloudy - Patches of Fog / Windy - Rain Shower - Rain Shower -
                                                                                                                                                                                                                                                                                                                                                                                                                          Smoke / Windy -
Snow Grains -
Snow and Sleet / Windy -
Squalls -
T-Storm / Windy -
Thunder / Winty Mix -
                                                                                                                                                                                           Heavy Sleet and Thunder –
Heavy Snow / Windy –
Heavy T-Storm / Windy –
                                                                                 Blowing Snow
                                                                                                                                                                                 Heavy Rain Showers
                                                                                                                                                                                                                                                                                                                                                                                        Sand / Dust Whirlwinds
                                                                                         Cloudy
Drifting Snow / Windy
                                                                                                                                                                                                                                                                   Weather Condition
In [18]: condition columns = [col for col in df.columns if 'Condition' in col]
                                                       print(condition columns)
                                                       ['Weather Condition']
In [19]: print(df.columns)
                                                      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_Twiligh
                                                      t',
                                                                                                'Astronomical Twilight', 'Hour', 'Weekday'],
                                                                                         dtype='object')
In [20]: print(df.columns)
                                                       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',
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t',
                                                                                               'Astronomical Twilight', 'Hour', 'Weekday'],
                                                                                        dtype='object')
In [21]: hour weather accidents = hour weather accidents.astype(int)
                                                      plt.figure(figsize=(12, 6))
                                                       sns.heatmap(hour weather accidents, cmap="YlGnBu", annot=True, fmt="d", cbar=F
                                                      plt.title('Accidents by Hour of Day and Weather Condition')
                                                      plt.xlabel('Weather Condition')
                                                      plt.ylabel('Hour of Day')
                                                       plt.show()
                                                                                                                                                                                                Accidents by Hour of Day and Weather Condition
                                                              ○ -2001/14 E495 2/ATRX E1/241(E1/08060004E2)00004(E6 91 10061/24) 53 7/091(E/06 10061)003(11 9/491)1085 20 5/42(45/2)00003(19)9040002(19)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)905(10)
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                                                                        Smoke / Windy -
Snow Grains -
                                                                                                                                                                                                                                                       Light Ice Pellets
                                                                                                                                                                                                                                                                                                                                         Overcast
Partly Cloudy
                                                                                                                                                                                                                                                                                                                                                                                             Scattered Clouds
                                                                                 Blowing Snow
                                                                                                                                                                                                                                                                                  Light Snow
                                                                                                                                                                                                                                                                                           Light Snow Shower ight Snow and Sleet
                                                                                                                                                                                                                                                                                                               Light Thunderstorm
                                                                                                                                                                                                                                                                                                                      Drifting Snow
                                                                                                                                                                                                                                                                                                                                                                                      Sand / Dust Whirlwinds
                                                                                                                                                                                  Heavy Rain Showers
                                                                                                                                                                                                                             Light Drizzle
                                                                                                                                                                                                                                       Light Freezing Drizzle
                                                                                                                                                                                                                                              Freezing Rain / Windy
                                                                                                                                                                                                                                                                                                                              Mostly Cloudy
                                                                                                                                                                                                                                                                                                                                                         Patches of Fog / Windy
                                                                                                                                                                                                                                                                                                                                                                                                                                         Snow and Sleet / Windy
                                                                                                 Drifting Snow / Windy
                                                                                                           Drizzle and Fog
                                                                                                                                                               Freezing Rain / Windy
                                                                                                                                                                                           Heavy Sleet and Thunder
                                                                                                                                                                                                    Heavy Snow / Windy
                                                                                                                                                                                                            Heavy T-Storm / Windy
                                                                                                                                                                                                                      Heavy Thunderstorms with Small Hail
                                                                                                                                                                                                                                                                 Light Rain Shower
                                                                                                                                                                                                                                                                           Rain with Thunder
                                                                                                                                                                                                                                                                                                                                                                           Rain and Sleet
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Thunderstorms and Rain
                                                                                                                                                                                                                                                 Light
                                                                                                                                                                                                                                                                 Weather Condition
                                                      weather features = ['Temperature(F)', 'Wind Chill(F)', 'Humidity(%)', 'Pressur
In [22]:
                                                       correlation = df[weather features + ['Severity']].corr()
                                                      plt.figure(figsize=(10, 8))
                                                       sns.heatmap(correlation, annot=True, cmap='plasma', fmt='.2f')
                                                      plt.title('Correlation Between Weather Features and Accident Severity')
                                                       plt.show()
```





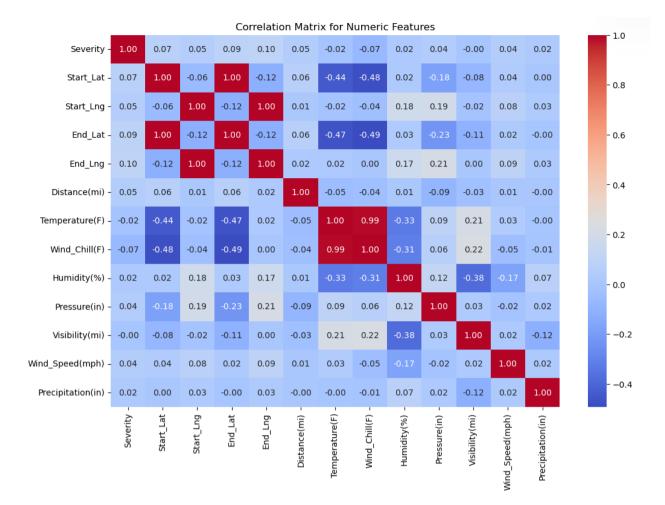
In [24]: print(df.dtypes)

ΙD object Source object int64 Severity Start Time datetime64[ns] End Time object Start Lat float64 float64 Start Lng End Lat float64 End Lng float64 Distance(mi) float64 Description object Street object City object County object State object Zipcode object Country object Timezone object Airport Code object Weather_Timestamp object



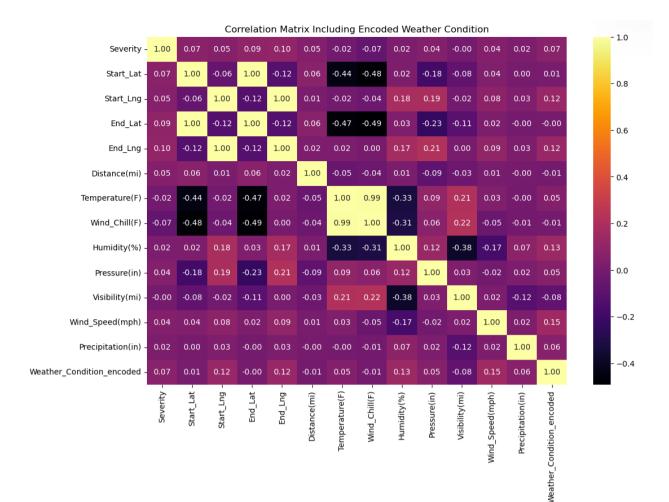
```
float64
         Temperature(F)
                                           float64
         Wind Chill(F)
         Humidity(%)
                                           float64
         Pressure(in)
                                           float64
         Visibility(mi)
                                           float64
         Wind Direction
                                           object
         Wind Speed(mph)
                                           float64
         Precipitation(in)
                                           float64
         Weather Condition
                                            obiect
         Amenity
                                              bool
         Bump
                                              bool
         Crossing
                                              bool
         Give Way
                                              bool
         Junction
                                              bool
         No Exit
                                              bool
         Railway
                                              bool
         Roundabout
                                              bool
         Station
                                              bool
                                              bool
         Stop
         Traffic Calming
                                              bool
         Traffic Signal
                                              bool
         Turning_Loop
                                              bool
         Sunrise Sunset
                                            object
         Civil_Twilight
                                            object
         Nautical Twilight
                                            object
         Astronomical Twilight
                                            object
         Hour
                                            int32
         Weekday
                                            object
         dtype: object
In [26]: numeric df = df.select dtypes(include=['float64', 'int64'])
         correlation_matrix = numeric_df.corr()
         plt.figure(figsize=(12, 8))
         sns.heatmap(correlation matrix, annot=True, cmap='coolwarm', fmt='.2f', cbar=T
         plt.title('Correlation Matrix for Numeric Features')
         plt.show()
```





```
In [27]:
         from sklearn.preprocessing import LabelEncoder
         label encoder = LabelEncoder()
         df['Weather Condition encoded'] = label encoder.fit transform(df['Weather Cond
         numeric df = df.select dtypes(include=['float64', 'int64']).copy()
         numeric_df['Weather_Condition_encoded'] = df['Weather_Condition_encoded']
         correlation matrix = numeric df.corr()
         plt.figure(figsize=(12, 8))
         sns.heatmap(correlation matrix, annot=True, cmap='inferno', fmt='.2f', cbar=Tr
         plt.title('Correlation Matrix Including Encoded Weather Condition')
         plt.show()
         C:\Users\vivek\AppData\Local\Temp\ipykernel 4296\3411963840.py:3: SettingWithC
         opyWarning:
         A value is trying to be set on a copy of a slice from a DataFrame.
         Try using .loc[row indexer,col indexer] = value instead
         See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/st
         able/user guide/indexing.html#returning-a-view-versus-a-copy
```

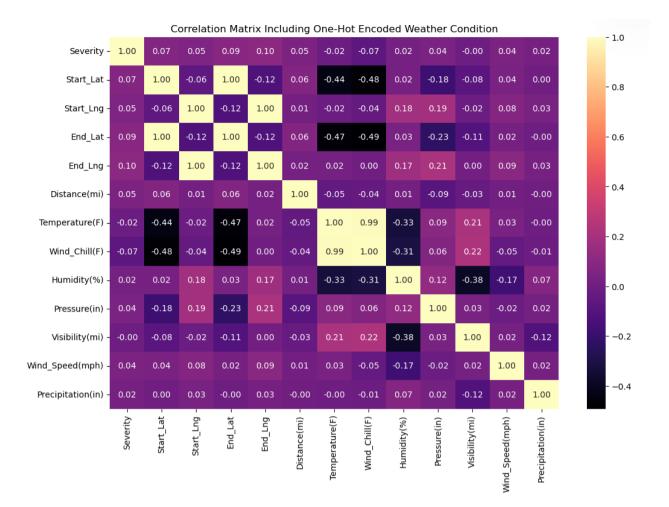




```
In [28]: df = pd.get_dummies(df, columns=['Weather_Condition'], drop_first=True)
    numeric_df = df.select_dtypes(include=['float64', 'int64'])
    correlation_matrix = numeric_df.corr()

plt.figure(figsize=(12, 8))
    sns.heatmap(correlation_matrix, annot=True, cmap='magma', fmt='.2f', cbar=True
    plt.title('Correlation Matrix Including One-Hot Encoded Weather Condition')
    plt.show()
```





In [29]: numeric summary = df.describe() print(numeric summary)

```
Start Time
                                                          Start Lat
           Severity
       6.985228e+06
                                             6985228
                                                       6.985228e+06
count
       2,229248e+00
                      2020-03-21 21:49:59.056442112
                                                       3.622647e+01
mean
                                 2016-01-14 20:18:33
min
       1.000000e+00
                                                       2.455480e+01
                      2018-09-17 02:20:31.750000128
25%
       2.000000e+00
                                                       3.342209e+01
50%
       2.000000e+00
                         2020-06-23 13:37:23.500000
                                                       3.581521e+01
75%
       2.000000e+00
                                 2021-10-28 15:44:07
                                                       4.009647e+01
       4.000000e+00
                                 2023-03-31 23:30:00
                                                       4.900220e+01
max
std
       4.988711e-01
                                                 NaN
                                                       5.055433e+00
                           End Lat
                                          End Lng
                                                    Distance(mi)
                                                                   Temperature(F)
          Start Lng
                      3.582466e+06
                                     3.582466e+06
                                                    6.985228e+06
count
       6.985228e+06
                                                                     6.839140e+06
      -9.476577e+01
                      3.632363e+01 -9.606114e+01
                                                    5.168789e-01
                                                                     6.168508e+01
mean
min
      -1.246238e+02
                      2.456601e+01 -1.245457e+02
                                                    0.000000e+00
                                                                    -8.900000e+01
                      3.350703e+01 -1.178403e+02
25%
      -1.172176e+02
                                                    0.000000e+00
                                                                     4.900000e+01
                                                    1.000000e-02
50%
      -8.789415e+01
                      3.627421e+01 -8.963065e+01
                                                                     6.400000e+01
75%
      -8.038722e+01
                      4.023982e+01 -8.029351e+01
                                                    3.880000e-01
                                                                     7.600000e+01
      -6.711317e+01
                      4.907500e+01 -6.710924e+01
                                                    4.417500e+02
                                                                     2.070000e+02
max
                      5.273354e+00
                                     1.816974e+01
                                                    1.746987e+00
                                                                     1.892246e+01
std
       1.735545e+01
       Wind Chill(F)
                        Humidity(%)
                                      Pressure(in)
                                                     Visibility(mi)
        5.011143e+06
                                      6.859985e+06
                                                       6.827127e+06
count
                       6.829884e+06
        5.799474e+01
                       6.501947e+01
                                      2.955900e+01
                                                       9.093596e+00
mean
min
       -8.900000e+01
                       1.000000e+00
                                      0.000000e+00
                                                       0.000000e+00
25%
        4.200000e+01
                       4.800000e+01
                                      2.939000e+01
                                                       1.000000e+01
50%
        6.200000e+01
                       6.700000e+01
                                      2.987000e+01
                                                       1.000000e+01
75%
        7.500000e+01
                       8.400000e+01
                                      3.004000e+01
                                                       1.000000e+01
```

```
2.070000e+02 1.000000e+02 5.863000e+01
                                                              1.400000e+02
         max
                                                              2.706562e+00
                 2.239818e+01 2.279870e+01 9.864551e-01
         std
                Wind Speed(mph)
                                  Precipitation(in)
                                                             Hour \
                   6.435855e+06
                                                     6.985228e+06
         count
                                       4.812697e+06
                   7.696474e+00
                                      8.824113e-03
                                                     1.226779e+01
         mean
         min
                   0.000000e+00
                                      0.000000e+00 0.000000e+00
         25%
                   4.600000e+00
                                      0.000000e+00
                                                    8.000000e+00
         50%
                   7.000000e+00
                                       0.000000e+00
                                                    1.300000e+01
         75%
                   1.040000e+01
                                      0.000000e+00 1.700000e+01
         max
                   1.087000e+03
                                       3.647000e+01
                                                     2.300000e+01
                   5.411353e+00
                                       1.170015e-01 5.455518e+00
         std
                Weather Condition encoded
         count
                             6.985228e+06
                             4.456084e+01
         mean
         min
                             0.000000e+00
         25%
                             1.500000e+01
         50%
                             1.500000e+01
         75%
                             8.400000e+01
                             1.430000e+02
         max
         std
                             3.991002e+01
In [30]:
         import matplotlib.pyplot as plt
         import seaborn as sns
         # Select numeric columns from the DataFrame
         numeric columns = df.select dtypes(include=['float64', 'int64']).columns
         # Set the figure size
         plt.figure(figsize=(15, 10))
         # Loop through numeric columns and create subplots
         for i, column in enumerate(numeric columns, 1):
             plt.subplot(4, 5, i) # Adjust rows/columns as needed
             sns.histplot(df[column], kde=True, bins=30) # Plot histogram with KDE
             plt.title(f'Distribution of {column}')
         # Adjust layout after all subplots have been created
         plt.tight layout()
         # Display the plots
         plt.show()
```



